Qualification Accredited

OCR
Oxford Cambridge and RSA

LEVEL 3 CERTIFICATE

Specification

CORE MATHS B (MEI)

H869

For first assessment in 2016

MEI Innovators in Mathematics Education

Version 2.4 (January 2024)

ocr.org.uk/coremaths

Disclaimer

Specifications are updated over time. Whilst every effort is made to check all documents, there may be contradictions between published resources and the specification, therefore please use the information on the latest specification at all times. Where changes are made to specifications these will be indicated within the document, there will be a new version number indicated, and a summary of the changes. If you do notice a discrepancy between the specification and a resource please contact us at: resources.feedback@ocr.org.uk

We will inform centres about changes to specifications. We will also publish changes on our website. The latest version of our specifications will always be those on our website (ocr.org.uk) and these may differ from printed versions.

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Registered office:
The Triangle Building
Shaftesbury Road
Cambridge
CB2 8EA

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Introducing…
Core Maths – Level 3 Certificate in Core Maths B (MEI)
(For first assessment in 2016)

Core Maths is a descriptor for a range of level 3 qualifications that have been introduced by the Department for Education (DfE) to increase post-16 participation in mathematics, it is not a qualification title in itself. OCR and Mathematics in Education and Industry (MEI) have jointly developed two new qualifications designed to meet the Core Maths requirements: Level 3 Certificate in Core Maths B (MEI) and Level 3 Certificate in Core Maths A (MEI). The intention for our qualifications is to prepare learners who have different goals to tackle a wide variety of mathematical problems. In particular, we want to emphasise and encourage these key outcomes:

- Sound understanding of mathematical concepts, skills and techniques from GCSE and beyond
- Fluency in procedural skills, common problem-solving skills and strategies
- Confidence in applying mathematical and statistical thinking and reasoning in a range of new and unfamiliar contexts to solve real-life problems
- Competency in interpreting and explaining solutions of problems in context

Contact the team

We have a dedicated team of people working on our Level 3 Certificate in Core Maths B (MEI) qualification.

If you need specialist advice, guidance or support, get in touch as follows:

01223 553998

maths@ocr.org.uk

@OCR_maths

Teaching and learning resources

We recognise that the introduction of a new specification can bring challenges for implementation and teaching. Our aim is to help you at every stage and we're working hard to provide a practical package of support in close consultation with teachers and other experts, so we can help you to make the change.

Designed to support progression for all

Our resources are designed to provide you with a range of teaching activities and suggestions so you can select the best approach for your particular students. You are the experts on how your students learn and our aim is to support you in the best way we can.

We want to…

- Support you with a body of knowledge that grows throughout the lifetime of the specification
- Provide you with a range of suggestions so you can select the best activity, approach or context for your particular students
- Make it easier for you to explore and interact with our resource materials, in particular to develop your own schemes of work
- Create an ongoing conversation so we can develop materials that work for you.

Plenty of useful resources

You'll have four main types of subject-specific teaching and learning resources at your fingertips:

- Delivery Guides
- Transition Guides
- Topic Exploration Packs
- Lesson Elements.

Along with subject-specific resources, you'll also have access to a selection of generic resources that focus on skills development and professional guidance for teachers.

Skills Guides – we've produced a set of Skills Guides that are not specific to Core Maths B (MEI), but each covers a topic that could be relevant to a range of qualifications – for example, communication, legislation and research. Download the guides at **ocr.org.uk/skillsguides**

Active Results – a free online results analysis service to help you review the performance of individual students or your whole school. It provides access to detailed results data, enabling more comprehensive analysis of results in order to give you a more accurate measurement of the achievements of your centre and individual students. For more details refer to **ocr.org.uk/activeresults**

Support and Advice

This specification is accompanied by a complete support package provided by OCR and MEI.

- Advice is always available from OCR and MEI.
- INSET provided by OCR and MEI.
- The MEI annual three-day conference.
- MEI branch meetings.
- Regular newsletter from MEI.
-

Professional Development

Take advantage of our improved Professional Development Programme, designed with you in mind. Whether you want to come to events, look at our new digital training or search for training materials, you can find what you're looking for all in one place at the CPD Hub.

An introduction to the new specification

We will be running events to introduce and help you deliver our Level 3 Certificate in Core Maths B (MEI) qualification.

These events are designed to help prepare you for first teaching and to support your delivery at every stage.

Watch out for details at **cpdhub.ocr.org.uk**

To receive the latest information about the training we'll be offering, please register for Level 3 Certificate email updates at **ocr.org.uk/updates**

1 Why choose an OCR Level 3 Certificate in Core Maths B (MEI)?

1a. Why choose an OCR qualification?

Choose OCR and you've got the reassurance that you're working with one of the UK's leading exam boards. Our Level 3 Certificate in Core Maths B (MEI) has been developed in consultation with teachers, employers, higher education and recognised learned and professional bodies to provide learners with a qualification that's relevant to them and meets their needs.

We're part of the Cambridge Assessment Group, Europe's largest assessment agency and a department of the University of Cambridge. Cambridge Assessment plays a leading role in developing and delivering assessments throughout the world, operating in over 150 countries.

We work with a range of education providers, including schools, colleges, workplaces and other institutions in both the public and private sectors. Over 13,000 centres choose our A Levels, Level 3 Certificates, GCSEs and vocational qualifications including Cambridge Nationals and Cambridge Technicals.

Our Specifications

We believe in developing specifications that help you bring the subject to life and inspire your students to achieve more.

We've created teacher-friendly specifications based on extensive research and engagement with the teaching community. They're designed to be straightforward and accessible so that you can tailor the delivery of the course to suit your needs. We aim to encourage learners to become responsible for their own learning, confident in discussing ideas, innovative and engaged.

We provide a range of support services designed to help you at every stage, from preparation through to the delivery of our specifications. This includes:

- A wide range of high-quality creative resources including:
    - Delivery Guides
    - Transition Guides
    - Topic Exploration Packs
    - Lesson Elements
    - …and much more.
- Access to Subject Advisors to support you throughout the lifetime of the specification.
- CPD/Training for teachers to introduce the qualifications and prepare you for first teaching.
- Active Results – our free results analysis service to help you review the performance of individual learners or the whole centre.

All Level 3 qualifications offered by OCR are accredited by Ofqual, the Regulator for qualifications offered in England. The accreditation number for OCR's Level 3 Certificate in Core Maths B (MEI) is QN: 601/4782/9.

1b. Why choose an OCR Level 3 Certificate in Core Maths B (MEI)?

OCR's new Level 3 Certificate in Core Maths B (MEI) course has been developed jointly by Mathematics in Education and Industry (MEI) and OCR. This is a well-established partnership which provides a firm foundation for curriculum and qualification development.

MEI is a long established, independent curriculum development body. MEI provides advice and CPD relating to all the curriculum and teaching aspects of the course. It also provides teaching resources, which for this specification can be found on the website (**www.mei.org.uk**).

Core Maths

OCR's Level 3 Certificate in Core Maths B (MEI) meets the requirements defined by the Department for Education (DfE) in their *Core Maths qualifications: Technical guidance* document, published in July 2014.

It has been approved by the DfE as a performance measure which is to be included in performance tables from 2017.

Qualification purpose

This qualification is designed to support post-16 learners with the mathematical and statistical needs of their further study of other subjects, as well as for employment and everyday life.

The needs of learners preparing for a variety of technical and professional roles are met through learning about mathematical modelling, costing, risk and the use of spreadsheets. Financial problem solving is a part of the qualification; this is important for all learners, irrespective of their future ambitions.

This qualification gives learners the mathematical skills to tackle problems in a variety of authentic situations*. It enables learners to strengthen the mathematical knowledge and skills which they have learnt at GCSE so that they can apply them to the problems which they will encounter in further study, life and employment. The use of technology – in particular, spreadsheets – is an integral part of the course.

As a result of digital technology, data are now being collected and used on a scale that was unimaginable just a few years ago. This is true in the workplace and in most areas of study. This qualification is designed to enable learners to understand this world.

A key understanding is that the application of statistics to solve real problems involves much more than a set of isolated techniques. A whole cycle of activity is involved and this is shown in the statistical problem solving cycle on page 11. Learners follow this cycle, and in doing so, learn a powerful approach for solving a wide variety of problems. In the process they become familiar with data and with techniques for working with data, something that will provide them with essential skills for employment, further study and the rest of their lives.

Analysis of many problems, from employment and across the curriculum, often shows that they can be solved using standard statistical procedures or models. However, suitable data have to be collected to provide the inputs for models and the parameters for statistical distributions. Only then can relevant calculations be carried out. Finally, the proposed solution to the problem must be interpreted, evaluated and communicated to other people.

*In this specification, authentic contexts, situations or problems should be understood to mean "similar to those which students may encounter in future life, work or study". See Appendix 5d.

Aims and learning outcomes

The intention of our qualification is to prepare learners, who have different goals in terms of their educational and employment progression, to tackle mathematical problems.

OCR's aim is to emphasise and encourage the following widely recognised and desirable outcomes:

- sound understanding of mathematical concepts, skills and techniques from GCSE and beyond
- fluency in procedural skills, common problem solving skills and strategies
- confidence in applying mathematical and statistical thinking and reasoning in a range of new and unfamiliar contexts to solve real life problems
- competency in interpreting and explaining solutions of problems in context.

1c. What are the key features of this specification?

OCR's Level 3 Certificate in Core Maths B (MEI) should encourage learners to be inspired, motivated and challenged by following a broad, coherent, practical, satisfying and worthwhile course of study. It should provide insight into and experience of how mathematics works, stimulating learners' curiosity and encouraging them to engage with mathematics in their everyday lives.

OCR's Level 3 Certificate in Core Maths B (MEI) is:

Research-led

- Research, international comparisons and engagement with both teachers and the wider education community have been used to enhance the reliability, validity and appeal of our assessment tasks.
- It will encourage the teaching of interesting mathematics, aiming for mastery leading to positive exam results.

Learner-focused

- OCR's specification and assessment consists of maths fit for the modern world and presented in authentic contexts.
- It will allow learners to develop mathematical independence built on a sound base of conceptual understanding.
- It will be a springboard for future progress and achievement in a variety of subjects and in future employment.

Teacher-centred

- The specification will be accompanied by an extensive teacher support package provided by MEI and OCR.
- Support and resources will focus on empowering teachers, exploring teaching methods and classroom innovation alongside more direct teaching resources.
- All MEI specifications are supported by a very large purpose-built website designed to help learners and teachers.
- OCR's assessment will be valid and reliable, recognising positive achievement in learning.

Dependable

OCR's high-quality assessments are built on sound educational principles and a belief that the utility, richness and power of mathematics should be made evident and accessible to all learners.

An emphasis on learning and understanding mathematical concepts underpinned by a sound, reliable and valid assessment.

1d. How do I find out more information?

If you are already using OCR specifications you can contact us at: **www.ocr.org.uk**

If you are not already a registered OCR centre then you can find out more information on the benefits of becoming one at: **www.ocr.org.uk**

Get in touch with one of OCR's Subject Advisors:

Email: **maths@ocr.org.uk**

Customer Contact Centre: 01223 553998

Visit our Online Support Centre at: **support.ocr.org.uk**

Advice is also available from MEI; contact details can be found on **www.mei.org.uk**

2 The specification overview

2a. Overview of Level 3 Certificate in Core Maths B (MEI) (H869)

Learners must complete both components (01 and 02) to be awarded the OCR Level 3 Certificate in Core Maths B (MEI).

*Indicates synoptic assessment is included in both components. A minimum of 25% of assessment for this qualification will be synoptic.

<table>
<tr><th>Content Overview</th><th colspan="2">Assessment Overview</th></tr>
<tr><td rowspan="2">• Modelling
• Statistics
• Finance
• Working with exponentials
• Working with graphs and gradients
• Geometry and measures
• Risk
• Statistical problem solving
• Use of technology</td><td>Introduction to Quantitative Reasoning (01)*
72 marks
2 hour written paper</td><td>50%
of total Level 3 Certificate</td></tr>
<tr><td>Statistical Problem Solving (02)*
60 marks
2 hour written paper</td><td>50%
of total Level 3 Certificate</td></tr>
</table>

2b. Content of Level 3 Certificate in Core Maths B (MEI) (H869)

This is a linear qualification. The content is split between two components: Introduction to Quantitative Reasoning and Statistical Problem Solving.

In Introduction to Quantitative Reasoning, learners are taught to use a modelling cycle, a statistical problem solving cycle and a financial problem solving cycle. They are also taught to use spreadsheets to work on a variety of problems.

In Statistical Problem Solving, learners use spreadsheets and the statistical problem solving cycle to analyse authentic statistical problems arising from a variety of work, life and study related contexts. They are introduced to more sophisticated statistical techniques and so are able to address a wider range of problems. Learners are expected to work with large, real data sets during the course and familiarity with the contexts involved in one such data set will be expected in the examination.

Format of question papers

Question papers will have answer spaces provided; there may be more space than learners need. Tables given for learners to complete may have more rows and/or columns than are needed.

Pre-release material

Pre-release material will be made available in advance of the examinations. It will be relevant to some (but not all) of the questions in an examination paper. The purpose of the pre-release material is to familiarise learners with contexts and data in advance of the examination so that they are able to engage in problem solving during the examination. This material will be used in two different ways.

- In Introduction to Quantitative Reasoning, the pre-release material will be specific to certain examination questions, allowing learners to become familiar with particular contexts that will then be used for authentic problem solving. This pre-release material will be published in mid-March for the examinations in June of that year.
- In Statistical Problem Solving, the pre-release material will be a large data set that can be used as teaching material throughout the course. It is comparable to a set text for a literature course. It will be published, in electronic form, at the start of the course in September. For example,

Pre-release material available	For use in assessment series
1st September 2015	June 2017
1st September 2016	June 2018
1st September 2017	June 2019
1st September 2018	June 2020
1st September 2019	June 2021

All subsequent assessment series will follow the same approach as outlined above.

In the examination it will be assumed that learners are familiar with the contexts covered by this data set. Half of the marks in the examination will be on questions that are based on the pre-release data set.

A printed copy of the pre-release material will be provided in the examination.

Competence statements

Competence statements are designed to help users by clarifying the requirements, but the following points need to be noted.

- Content that is covered by a competence statement may be tested in an examination question without further guidance being given.
- Many examination questions will require learners to use two or more competence statements at the same time without further guidance being given.

Competence statements have an implied prefix of the words: 'A learner should …'

Each competence statement has a unique reference code. For example, in the code IQRq1, IQR refers to the component Introduction to Quantitative Reasoning; q refers to 'use of technology' (see below) and 1 means that it is the first such competence statement in the list.

The letters used in assigning reference codes to competence statements are as follows:

a	algebra
b	bivariate data
e	estimation
f	financial problem solving
g	graphs
h	statistical hypothesis testing
l	large and small numbers
m	geometry & measures
n	numerical problem solving
p	mathematical processes (e.g. modelling)
q	use of technology
s	statistical problem solving
u	probability (uncertainty)

Notes, notation and exclusions

The notes, notation and exclusions columns in the specification are intended to assist teachers and learners.

- The notes column provides examples and further detail for some competence statements.
- The notation column shows the notation and terminology that learners are expected to know, understand and be able to use.
- The exclusions column lists content which will not be tested, for the avoidance of doubt when interpreting competence statements.

Use of technology

Learners are expected to use a calculator (scientific or graphical) in the examinations. However, some questions may ask learners to work without a calculator; in such cases no credit will be given for answers with insufficient working. Questions may include printouts from spreadsheets which learners will need to complete or interpret.

2c. Content of Introduction to Quantitative Reasoning (Component 01)

Component objectives

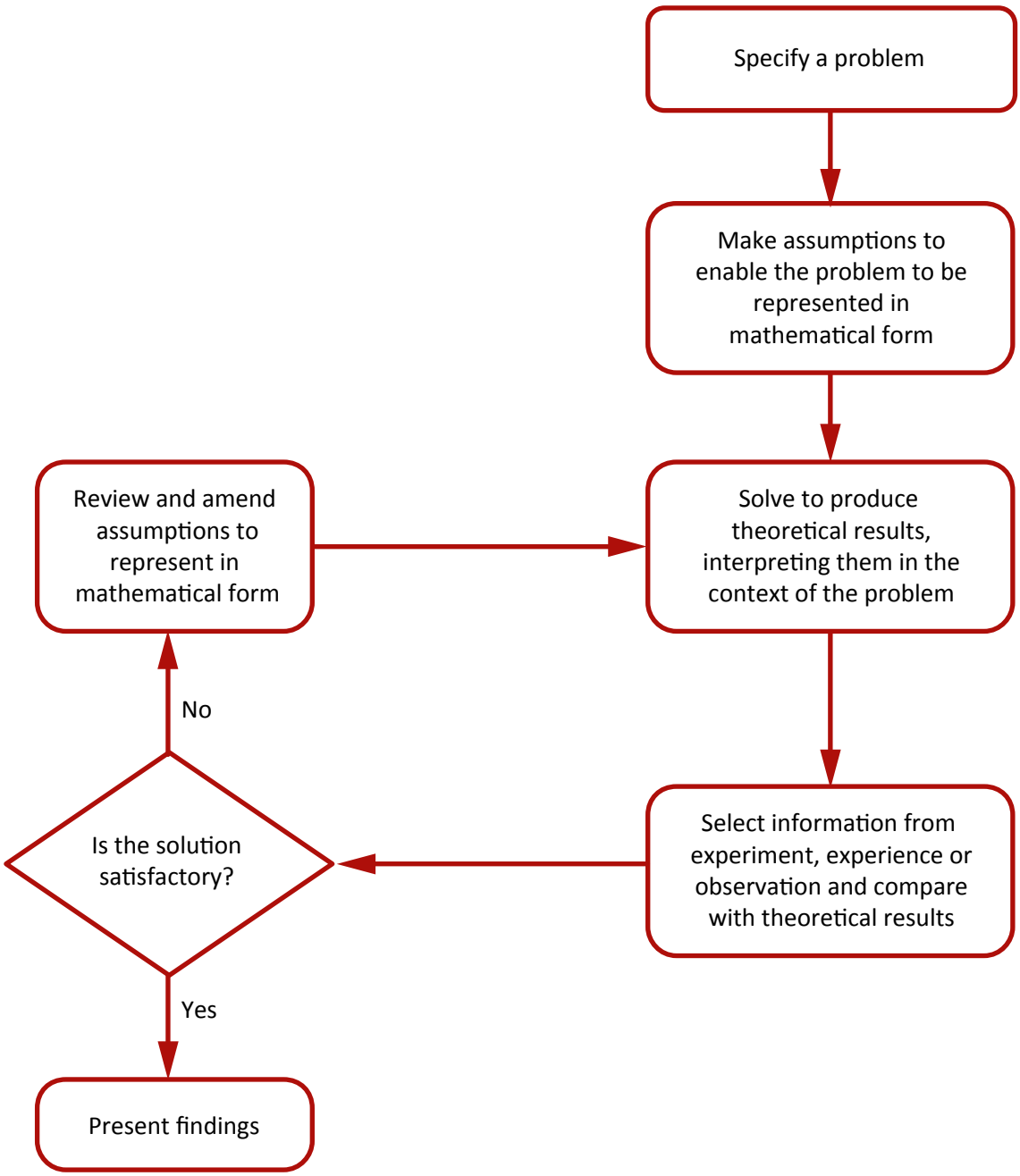
Learners should:

- consolidate and extend the mathematics they have learnt at GCSE
- develop transferable skills in mathematics
- be able to work fluently in a variety of contexts
- use problem solving cycles in modelling, statistics and financial mathematics
- apply common sense to check the outcomes of calculations
- use appropriate technology in their work.

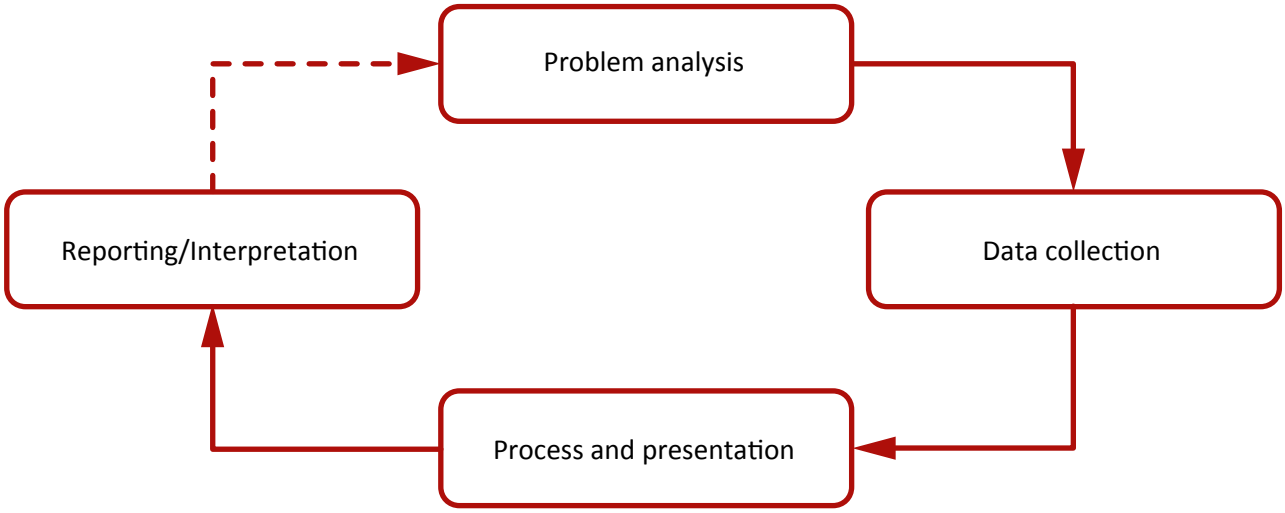
The Modelling Cycle

The examinations will assume that learners have used the full modelling cycle during the course.

Mathematics can be applied to a wide variety of **problems** arising from real situations but real life is complicated, and can be unpredictable, so some **assumptions** need to be made to simplify the situation and allow mathematics to be used. Once answers have been obtained, we need to **compare with experience** to make sure that the answers are useful. For example, the government might want to know how many primary school children there will be in the future so that they can make sure that there are enough teachers and school places. To find a reasonable estimate, they might **assume** that the birth rate over the next five years will be similar to that for the last five years and those children will go to school in the area they were born in. They would **evaluate** these assumptions by checking whether they fit in with **new data** and **review** the estimate to see whether it is still reasonable.

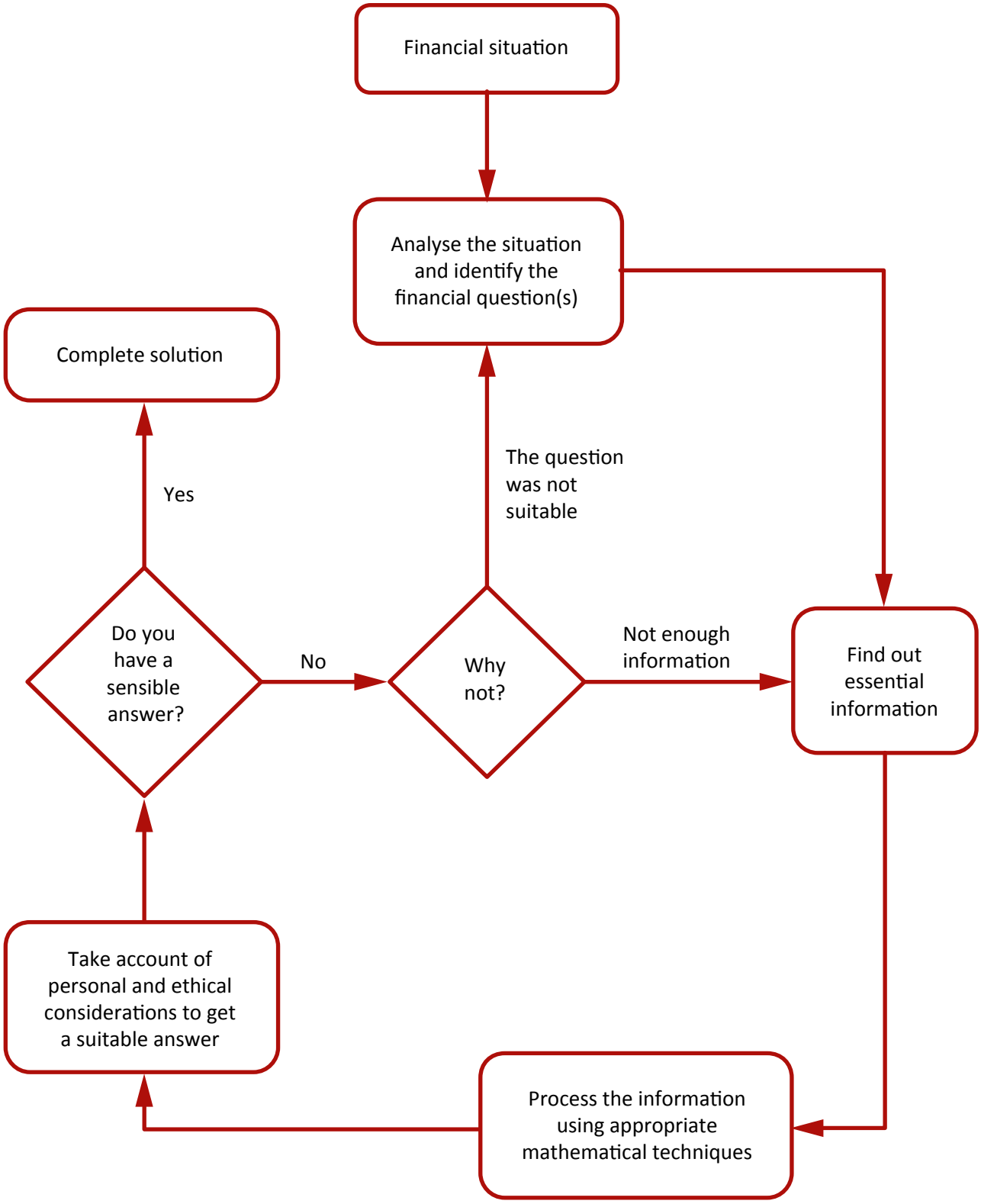


The Statistical Problem Solving Cycle



Process	Description
Problem analysis	This process involves the work at both the start and the end of the statistical problem solving cycle. The problem to be addressed needs to be formulated in a way which allows statistical methods to be used; decisions need to be made at this early stage to ensure that relevant data are collected. The problem may be stated as a research question or as a hypothesis. The analysis may involve considering whether there is an appropriate statistical distribution to use (e.g. the Normal distribution) or whether there is a standard statistical model (e.g. a straight line relationship in a scatter diagram) that can be applied. At the completion of the statistical problem solving cycle, there needs to be consideration of whether the original problem has been solved in a satisfactory way or whether it is necessary to repeat the problem solving cycle in order to gain a better solution. For example, reflection on the interpretation may show up a possible source of bias in data collection and the cycle may need to be repeated to eliminate the bias.
Data collection	Learners will need to decide how data will be collected when using their own (primary) data, taking account of practical and ethical considerations, and then collect the data. When using data collected by someone else (secondary data) learners should try to find out how the data have been collected to identify any possible sources of bias. The work may also involve taking a sample from a large secondary data set (e.g. the national census).
Process and presentation	This stage involves using suitable techniques, such as data displays and statistical summary measures, in order to make sense of the (primary or secondary) data collected in the previous stage. The techniques used should be those planned for at the analysis stage and any appropriate additional techniques. This stage ends with a provisional solution to the problem.
Reporting/ Interpretation	This stage of the process involves reporting the solution to the problem in a way which relates to the original research question or hypothesis. Communication should be in clear plain English which can be understood by someone who has an interest in the original problem but is not an expert in statistics. This should lead into reflection on the solution to consider whether it is satisfactory or further work is needed.

The Financial Problem Solving Cycle



Notes on the Financial Problem Solving Cycle

Financial situation

Examples of financial situations include the following:

- deciding what to do with income
- needing to find somewhere to live
- planning for the future.

Financial question

Examples of financial questions include the following:

- How much will that coat cost in the sale?
- How much will I earn after my wage rise?
- I am making earrings to sell; how much should I charge for them?
- Where should I borrow money to buy a car?
- Where should I invest my money?
- How much should I put aside for my pension each month?

Essential information

Examples of information which could be needed to answer the question include the following:

- the percentage reduction for a sale
- if someone wants to sell something, they need to know what it cost and how much someone else might be willing to pay
- asking an adviser about options for loans or investments.

Process the information

This could include the following:

- using a spreadsheet
- doing a calculation
- putting information into a table or chart
- using summary measures.

Personal and ethical considerations

Examples include the following:

- one shop might be cheaper than another but pay its workers low wages so people may prefer to shop at the more expensive shop
- I may want to buy a car but I need to think about how much spare money I have to repay a loan
- it may be cheaper to buy a larger pack of fruit than a smaller one but someone may get the smaller one to avoid waste.

Being unable to find an appropriate solution

There are various reasons why it may not be possible to give a satisfactory answer to the original question.

Here are some examples:

- The original question was too vague so it is not possible to tell whether it has been answered or not – the question should be made more specific in a second circuit of the cycle.
- It is not possible to find a satisfactory answer. For example, someone wants to buy a large house but cannot afford to repay the mortgage. The question should be amended: perhaps looking for a smaller house or considering shared ownership.
- It may not have been possible to find enough information to answer the question. Advice should be sought in a second circuit of the cycle.

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
USE OF TECHNOLOGY					
Calculators	IQRq1	Be able to use a standard calculator (scientific or graphical).			
Spreadsheets	q2	Be able to read information from a standard spreadsheet.			
	q3	Be able to enter formulae and data into a spreadsheet, knowing that a standard spreadsheet formula starts with =.	Formulae based on the 4 rules of arithmetic and other standard functions required by the rest of this specification, e.g. to the power of, square root.	e.g. =B2*(C2+D2) =C3^4 =SQRT(A10)	
	q4	Be able to interpret simple formulae on a spreadsheet given in terms of cell references.	Examples include money, number patterns and simple sequences.	e.g. =AVERAGE(A1:A9)	
	q5	Be able to copy a formula and to ensure that only the required cell addresses increment.		e.g. $A1, A1, A$1	
	q6	Be able to use a spreadsheet to find a numerical solution of an equation.	Equations in one variable, involving powers and/or roots using trial and improvement.		Fixed point iteration.
	q7	Be able to use a spreadsheet to draw graphs and standard statistical diagrams and interpret graphs produced on spreadsheets.	Including awareness of when graphs produced by a spreadsheet are misleading or incorrect.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
MODELLING					
The modelling cycle	IQRp1	Be able to identify simplifying assumptions that allow a situation to be modelled.			
	p2	Be able to develop or choose a simple mathematical model for a real-world situation.	Model in words, numerically, algebraically, diagrammatically or in a spreadsheet.		
	p3	Be able to use a model to make predictions or get information about a situation.	For example, use a simple demand curve (e.g. a linear model) to predict the change in revenue following a given change in price.		
	p4	Be able to compare the outcomes from a model with actual data, information, experience or common sense and comment on the appropriateness of the model.	For example, compare an exponential growth model with actual population figures. The information may be given in diagrammatic or graphical form.		
	p5	Be able to appraise the assumptions underlying a model critically.			
	p6	Understand that a simple model can give useful answers but may need to be improved.	Includes comparing outcomes from two models.		
	p7	Be able to communicate mathematical results clearly and effectively.	Including to a person or audience unfamiliar with the underlying mathematics.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
			MODELLING		
Estimation	IQRe1	Be able to make a rough estimate of a quantity from available information.	This includes financial estimates such as conversion from a foreign currency to pounds without a calculator.		
	e2	Be able to use estimates when checking calculations.			
	e3	Be able to make and justify upper and lower bounds for a calculation.	Includes selecting and/or justifying an appropriate level of accuracy for an answer to a calculation.	Maximum, minimum, upper bound, lower bound.	
	e4	Be able to interpret and present error bounds or tolerances on diagrams and in writing, understanding that different levels of tolerance are appropriate in different situations.	Error bounds may be required in percentage form.	12 ± 0.5 $340 \pm 10\%$ $8.5\,\text{cm} \leq D \leq 9.5\,\text{cm}$	
Algebra	IQRa1	Be able to represent a situation mathematically using a formula or equation.	Using both traditional algebra and spreadsheet notation.		
	a2	Be able to substitute values into a formula given in symbols, words or as a flow chart.	Formulae will be confined to the following cases (or simple combinations of these): • polynomials • simple rational expressions • exponential growth and decay • trigonometric functions (sin and cos).		
	a3	Be able to solve equations and change the subject of a formula.	In simple cases using the four operations, powers and roots. Solve more complex equations using trial and improvement or a graphical method.		Changing the subject of an exponential formula.

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
MODELLING					
Geometry & measures	IQRm1	Be able to recognise and use relationships between lengths, areas, weights and volumes of similar figures to model real-world situations.			
	m2	Be able to work with time, length, area and volume to meet given regulations.	e.g. In the context of meeting health and safety requirements. Regulations to be met will be given to learners.		
	m3	Be able to work with commonly used units and know that quantities being compared should have the same units; this includes compound units.	e.g. Units of time, speed. e.g. Units of speed are units of distance divided by units of time. e.g. Understanding that the units of quantities arise from the way they are calculated. Where appropriate, conversion factors between metric and imperial units will be given.		
	m4	Be able to interpret diagrams, maps and scale drawings and be able to use them in problem solving.			
	m5	Be able to work with representations of 3-D objects in 2-D.	Representations include plans and elevations, sketches and isometric drawings.		
	m6	Understand the terms displacement, distance, velocity, speed and acceleration; perform associated calculations.	Displacement as directed distance from a starting point; velocity as directed speed.		
Number	n1	Be able to use ratio and proportionality in authentic contexts.			

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
			STATISTICS		
The statistics cycle	IQRs1	Be able to decide what data need to be collected in order to answer a question requiring statistical evidence.			
	s2	Be able to use a suitable method for collecting data, taking ethical considerations into account, and judge whether data are of sufficient quality.	The data may be primary or secondary, and may be read off a graph or diagram.		
	s3	Be able to process and present the data and so provide an answer to the original question.			
	s4	Be able to interpret the answer to the question and decide whether it is realistic.			
Data	s5	Understand and use the language describing types of data.	Primary, secondary; categorical, numerical; continuous, discrete.		
	s6	Be able to recognise values in primary or secondary data which are unlikely to be accurate.		Outlier.	Formal criteria for outliers.
	s7	Be able to read information from a table and to construct a table to present information.	Includes grouping data using suitable class intervals.		
	s8	Understand the meaning of the terms sample and population.	The idea of random sampling.		The names of particular sampling methods will not be examined.
	s9	Be able to interpret sample data in terms of possible properties of the parent population.	e.g. Sample mean as an estimate of population mean.		
	s10	Understand about the variability of data and be able to describe the main features of a distribution.	Includes understanding that the average from a sample will generally be different from the population average. The main features include the central tendency (average) and spread.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
			STATISTICS		
Statistical diagrams and measures	IQR s11	Be able to use and interpret statistical diagrams appropriate to a variety of types of data.	Diagrams include: box and whisker plots, dot plots, scatter diagrams, bar charts, pie charts, histograms, frequency charts, cumulative frequency diagrams. Learners may be asked to complete these diagrams in the examination.	A frequency chart resembles a histogram with equal width bars but its vertical axis is frequency. A dot plot is similar to a bar chart but with stacks of dots in lines to represent frequency.	Calculation of frequency density.
	s12	Be able to identify when a statistical diagram is misleading and explain how it could be improved.	e.g. Improvement by clearer labelling or a better scale.		
	s13	Be able to identify skewness from a histogram, frequency chart or box and whisker plot.	In appropriate contexts. Positive and negative skewness.		Measures of skewness.
	s14	Be able to interpret a scatter diagram for bivariate data, draw a line of best fit by eye when it is appropriate to do so and understand that extrapolation might not be justified.	Including the terms association, correlation, line of best fit.		Learners will not be expected to calculate correlation coefficients or regression lines.
	s15	Be able to select and calculate appropriate measures of central tendency and to interpret them.	Mean, median, mode. Includes grouped data and calculation or estimation for data in a statistical diagram.	Number of data items = n Sample mean $= \overline{x}$	
	s16	Be able to use appropriate measures of spread and to interpret them.	Calculate range, inter-quartile range, semi inter-quartile range. Includes grouped data and calculation or estimation for data in a statistical diagram. Know that standard deviation is a measure of spread.		Learners will not be expected to calculate standard deviation.

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
STATISTICS					
Statistical diagrams and measures	IQRs17	Be able to calculate a weighted mean and recognise when it is appropriate to do so.			
The Normal distribution	s18	Know that the Normal distribution is a model which can be used for real data and recognise a Normal curve.	Know that the distribution is symmetrical about the mean for the population but understand that histograms for samples will usually not be exactly symmetrical.		
	s19	Know that, for a Normal distribution, values more than three standard deviations from the mean are very unusual; know that approximately 95% of the data lie within two standard deviations of the mean and that 68% (just over two thirds) lie within one standard deviation of the mean.	Learners may be asked to estimate mean and standard deviation from a Normal curve.	μ for population mean. σ for population standard deviation.	Learners will not be expected to calculate Normal probabilities.
	s20	Be able to use mean and standard deviation to calculate a *z*-score and use *z*-scores for comparison or quality control.	Includes interpreting *z*-score as number of standard deviations away from the mean.	Standardised score; *z*-score; *z*-value.	
	s21	Be able to interpret a Normal probability plot from statistical software.	A straight line indicates a Normal distribution.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
			FINANCE		
The financial cycle	IQRf1	Be able to decide what information is needed to address a financial situation.			
	f2	Know how to obtain the necessary information.	The information may be presented in a graph or diagram.		
	f3	Be able to process the information to provide one or more possible solutions.			
	f4	Be able to decide which, if any, of the solutions are appropriate.			
Percentages	f5	Be able to do calculations involving percentages in context; the use of an index number to compare a number or value to that in a base year.	Contexts include those outside finance. Examples of financial contexts include VAT, inflation and compound interest for savings or loans. Expected calculations include forward and reverse percentage increase and decrease, repeated and combined percentage change and finding a percentage change.		
	f6	Know how to use percentages to work with appreciation or depreciation.	Including comparison of an annual percentage depreciation (or appreciation) model with actual values over time.		
	f7	Be able to work out an average annual percentage growth (or reduction) rate for a given change over a period.	Contexts include those outside finance.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
			FINANCE		
Foreign exchange	IQRf8	Be able to use foreign exchange rate information to make calculations, including calculations for currency exchange with commission or a fee.	In the UK, "sell at 1.54, buy at 1.69" means that when converting from pounds to the currency, a customer gets 1.54 of the currency for £1, but when changing the currency to pounds, 1.69 of the currency is needed for £1.	"buy at"; "we buy"; "buy rate" are different ways of saying the same thing; similarly, "sell at"; "we sell"; "sell rate".	
	f9	Be able to decide which foreign exchange rate is most advantageous for a particular exchange without doing the calculations.	Deciding and justifying which exchange rate is most advantageous to the customer.		
Costing	f10	Be able to work out the regular outgoing cost for a financial decision.	Examples include the monthly cost of buying and running a car or renting and running a home.		
	f11	Be able to find relevant information from tables.			
	f12	Be able to use a spreadsheet to cost a project or business proposal, recognising that some costs are more predictable than others over time.	Learners may be asked to monitor whether a budget is being followed over time, and to calculate projected costs from the budget.		
	f13	Be able to use a demand curve as a model for the relationship between price and demand.		Demand curves have demand on the horizontal axis and price on the vertical axis.	
	f14	Understand and use the language of finance.	Words such as income, expenditure, budget, profit, loss, investment, tax, revenue, inflation, APR and AER.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
WORKING WITH EXPONENTIALS					
Standard form	IQRI1	Be able to interpret large or small numbers in standard form, including the use of a spreadsheet or calculator.	Standard form is sometimes called scientific notation.	3.1×10^8 3.1 E +08 3.1 E +008 3.1 EXP 08	
	I2	Be able to calculate with numbers in standard form.	e.g. Contexts such as astronomy, wavelengths, atoms or cells.		
Exponentials	I3	Be able to explore exponential growth and decay, including interpreting output from a spreadsheet.	Contexts include borrowing and saving money, bacterial growth and radioactive decay.		
	I4	Be able to represent and interpret exponential growth or decay in a graph.	Learners may be asked to plot or sketch exponential graphs.	Half life $y = ka^x$ with k and a constant.	
	I5	Be able to solve equations of the forms $x^5 = 35$ and $1.05^x = 8.2$.	Trial and improvement for equations of form $1.05^x = 8.2$.		Use of logarithms to solve equations of the form $1.05^x = 8.2$.
Logarithmic scales	I6	Be able to use and interpret a logarithmic scale on a graph.	Learners should know that the value equidistant between a and b on a linear scale is the arithmetic mean $\left(\frac{a+b}{2}\right)$ but for a logarithmic scale it is the geometric mean $\left(\sqrt{ab}\right)$.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
WORKING WITH GRAPHS AND GRADIENTS					
Graphs	IQRg1	Know that the independent variable is plotted on the horizontal axis of a graph.		Dependent variable, response variable, independent variable, explanatory variable.	
	g2	Be able to construct a table of values for a graph from a simple formula and use it to plot the graph.	Includes trigonometric graphs (sin and cos) for angles in degrees.		
	g3	Be able to use a graph to construct a table of values.			
	g4	Be able to work with graphs drawn from a variety of contexts.	Includes graphs representing motion along a straight line, time series graphs, step graphs, periodic graphs, graphs of exponential growth and decay and piecewise graphs.		
	g5	Recognise graphs of direct and inverse proportion.			
	g6	Be able to linearise the graph of a relationship where the dependent variable is directly proportional to some function of the independent variable.	e.g. Plot y against x^2 to investigate a relationship of the form $y = ax^2$.		
	g7	Understand the relationship between a straight line graph and the formula connecting the variables graphed.			

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
WORKING WITH GRAPHS AND GRADIENTS					
Gradients	IQRg8	Be able to find the gradient of a straight line graph and interpret it in context, taking account of the scales on the axes and using appropriate units.	Includes finding units for the gradient from units on the axes.		
	g9	Be able to estimate the gradient of a curve at a point by drawing a tangent and interpret it as a rate of change.	Includes e.g. kinematics graphs and growth curves.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
RISK					
Probability	IQRu1	Be able to identify relevant equally likely outcomes in appropriate contexts.	Includes understanding when outcomes are not equally likely.		
	u2	Be able to count equally likely outcomes in appropriate contexts and hence estimate a probability.	Includes listing and use of tree diagrams to find number of outcomes.		Formal understanding of factorials, permutations and combinations.
	u3	Be able to estimate probability from long-run relative frequency.			
	u4	Be able to interpret two-way tables and use them to calculate or estimate probability.			
	u5	Understand the difference between dependent and independent events and be able to calculate probability in simple cases.	Contexts include games of chance and risk of suffering from diseases.		
	u6	Be able to work with a tree diagram when calculating or estimating a probability, including conditional probability.	Learners can choose to work with either frequencies or probabilities in tree diagrams.	Given that	Notation P(A), P(A|B) etc.
Risk	u7	Understand risk given as a probability or as 1 in *n* or as a description such as “once in *n* years”.	Includes moving between these forms.		
	u8	Be able to interpret a risk assessment, understanding that it involves measures of both likelihood and impact.			

2d. Content of Statistical Problem Solving (Component 02)

Component objectives

Learners should:

- have the confidence to work on a problem where the method of solution is not obvious
- learn the skills they need to use real data in problem solving
- use statistical models to address problems from a variety of contexts
- decide on a model that is appropriate to the problem
- determine parameters for a model
- use the mathematical techniques that they are likely to meet when working with a variety of statistical models
- present their results in a form that is relevant to the original problem
- decide whether their results are reasonable
- interpret their results in terms of the original problem
- understand that uncertainty is often a feature of statistical problem solving.

Assumed knowledge

Learners are expected to know the content of Introduction to Quantitative Reasoning.

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROBLEM ANALYSIS					
Strategies for problem solving	SPSs1	Be able to formulate a problem in a way that lends itself to statistical approaches.	There is no exclusive list of problems; they may be drawn from a variety of contexts.		
	s2	Consider different statistical approaches to a problem.	Learners will be expected to make and identify approximations and simplifications that allow them to tackle a problem.		
Selecting a model	s3	Be able to select an appropriate standard distribution as a model.	e.g. The Normal distribution or the uniform distribution.		
	s4	Recognise where a standard statistical procedure may be used.	e.g. Drawing a line of best fit or using a hypothesis test.		
	s5	Be aware of any modelling assumptions involved in using a distribution or procedure that has been selected.			
Inputs	s6	Be able to identify what inputs a model requires.	This includes identifying and selecting suitable parameters, and collecting relevant data.		
	s7	Be able to design a procedure for collecting the necessary input data for a model.			
	s8	Understand the sources of variability in data and their implications in the context of a model and its inputs.	Natural variability, experimental error or sampling error.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROBLEM ANALYSIS					
Inference	SPSh1	Understand the process of hypothesis testing, including using the associated vocabulary.	• null hypothesis, alternative hypothesis • significance level, p-value • 1-tail test, 2-tail test • critical value • critical region • acceptance region, rejection region.	H_0, H_1	
	h2	Be aware that large data sets can be representative of underlying populations and can be used to draw conclusions.	Recognising when a large data set is representative of the whole population. e.g. Using visual displays, summary values.		
DATA COLLECTION					
Sampling	SPSs9	Know and be able to use suitable sampling methods in appropriate contexts.	Sampling methods include: • opportunity sampling • simple random sampling • stratified sampling • quota sampling • cluster sampling • self-selected sampling.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
DATA COLLECTION					
Information sources	SPSe1	Be able to call on factual general knowledge.			
	e2	Be able to make reasonable estimates of quantities met in everyday life without additional information.	Quantities such as the following: • estimates of adult height, weight and other body measurements • the time an adult would take to perform an everyday task.		
	SPSs10	Be able to find and use relevant information from a variety of sources.	When familiarising themselves with the pre-release data learners should use a variety of information sources. Examples include: • the internet • maps • books • people.		
	s11	Be able to evaluate critically information in public statements such as news reports and political comments.	e.g. Conclusions drawn from data, statements involving percentages.		
	s12	Be able to understand accounts of statistical work done by others and comment on its quality.			

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROCESS AND PRESENTATION					
Raw data	SPSs13	Be able to select suitable techniques for processing raw data.	Typically these data will have been obtained from a sample.		
	s14	Be able to clean data including dealing with missing data and outliers.	An outlier is an item which is inconsistent with the rest of the data. The term is sometimes applied to data which are: • at least 2 standard deviations from the mean • at least 1.5 × inter-quartile range beyond the nearer quartile.		
Graphs, charts and summary measures	s15	Be able to select suitable data displays and summary measures to show the main features of raw data.	e.g. Standard statistical diagrams, cartesian graphs. e.g. Mean, standard deviation, median, inter-quartile range. e.g. Index numbers derived from data. (Learners will be given sufficient guidance.)		
	s16	Be able to use data displays to check whether distributions being used are realistic.	e.g. A histogram, frequency chart or Normal probability plot to check a distribution is approximately Normal.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROCESS AND PRESENTATION					
Parameters and inputs	SPSs17	Use standard statistical notation for samples.		Sum, $\sum$ Sample size, n Mean, $\overline{x} = \frac{\sum x}{n}$ Deviation, $x - \overline{x}$ Standard deviation, s	
	s18	Be able to use sample data to estimate the parameters of a distribution or the inputs for a procedure or model.	Includes variance and standard deviation.	Variance, s^2	
	s19	Be able to use the statistical functions of a calculator to find the mean and standard deviation.	Most calculators have two forms of standard deviation; either is acceptable.		Large sets of raw data.
	s20	Understand the use of a datum level as a base for measurement or calculation.		Datum level.	
	s21	Know how the mean and standard deviation are affected by linear transformations.	$y_i = a + bx_i \Rightarrow \overline{y} = a + b\overline{x}, s_y = bs_x$ Use in change of units and origin for measurement.		Negative values of b. Proof.
Calculations	s22	Be able to substitute input values into a model or procedure.			

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROCESS AND PRESENTATION					
The Normal distribution	SPSu1	Be able to use the Normal distribution as a model and recognise when it is likely to be appropriate to do so.			
	u2	Be able to standardise a value from a Normal distribution with a given mean and standard deviation.	Standardised scores.	$X \sim N(\mu, \sigma^2)$ *z*-value	Proof that the standardised value has a Normal distribution.
	u3	Use the Normal distribution to estimate population proportions in the context of a problem.	Using software, calculator functions or statistical tables.		
The χ^2 test	SPSh3	Be able to apply the χ^2 hypothesis test to data in a contingency table.	Including calculating the contributions of individual cells to the test statistic. The null hypothesis is that the classifications used for the rows and columns are independent. Tables of critical values will be provided.		Yates's correction.
	h4	Be able to interpret the results of a χ^2 test.	This may involve considering the individual contributions to the test statistic.		

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
PROCESS AND PRESENTATION					
Bivariate data	SPSb1	Know the vocabulary associated with bivariate data.	Association, correlation, line of best fit, dependent variable, independent variable.		
Spearman's rank correlation	b2	Know how to calculate Spearman's rank correlation coefficient and carry out hypothesis tests using it.	The null hypothesis is that there is no association between the variables. Both 1-tail and 2-tail tests will be tested. Tables of critical values will be provided.	Sample value, r_s	
Product moment correlation	b3	Be able to use suitable technology to find Pearson's product moment correlation coefficient and to interpret the correlation coefficient.	Learners may be asked to calculate it using calculator functions for a small data set.		Calculation of the product moment correlation coefficient using a formula.

Specification	Ref.	Competence Statements	Notes	Notation	Exclusions
REPORTING/INTERPRETATION					
Interpretation	SPSs23	Be able to interpret the proposed solution in terms of the original problem.	Recognise the uncertainty of the outcome.		
	s24	Be able to interpret the result of a hypothesis test in terms of the original problem.			
Checking	s25	Recognise when the proposed solution is unreasonable.			
	s26	Be able to identify and comment on possible sources of bias or error which may have affected the solution to a problem.	e.g. make reference to the sampling or experiment.		
Evaluation	s27	Recognise when the approach taken needs to be refined or replaced.			
	s28	Be able to propose a refined or new approach.			
	s29	Recognise that a “good enough” solution to a problem can save time and money compared to a more accurate solution.			
	s30	Recognise when additional data collection would enable a better solution to a problem.			
Communication	s31	Be able to communicate the solution to someone who understands the problem.			

2e. Prior knowledge, learning and progression

OCR's Level 3 Certificate in Core Maths B (MEI) qualification is designed to be useful for all learners in their everyday lives; it can be considered a 'mathematical literacy' course.

OCR's Level 3 Certificate in Core Maths B (MEI) qualification places emphasis on mathematical and statistical problem solving and is designed to support learners on academic, mixed and vocational programmes of study; to prepare them for higher education, employment, and their everyday lives as citizens. It is intended for:

- learners taking Level 3 courses, for whom GCE Mathematics is not appropriate
- learners who need support with mathematics for Level 3 or HE courses: for example, in business, biology, chemistry, computing, economics, geography, ICT, psychology, sociology or health and social care
- learners who need to continue with some mathematics because they intend at some stage to enter a teacher training or health professional training course
- learners who do not intend to continue their education and will be moving on to do apprenticeships or straight into employment.

It is expected that learners have achieved a GCSE (9–1) in Mathematics and are familiar with the GCSE (9–1) content which is in plain text in the subject content and assessment objectives.

The underlined and bold content from the GCSE Mathematics subject content and assessment objectives for GCSE (9–1) Mathematics for teaching from 2015, which are needed in this qualification have been specified in the content.

2f. Synoptic learning

Learners use mathematical and statistical skills and understanding to solve authentic problems throughout the course for Core Maths B. The nature of such problem solving is that learners need to decide what mathematical skills and understanding to use in order to address the problem. This requires a strong understanding and familiarity with the mathematics they have learnt and the ability to bring together mathematical knowledge which has been learnt at different times. Some problems can be solved more than one way. Learners should be encouraged to compare different possible solutions in order to strengthen their synoptic understanding of the course content and their ability to choose effective methods for addressing problems.

The two components can be taught alongside one another or learners can start on the Introduction to Quantitative Reasoning first; the knowledge, understanding and skills from that component continue to be used in Statistical Problem Solving which requires learners to develop their understanding further to allow analysis and interpretation of a greater variety of problems.

3 Assessment of OCR Level 3 Certificate in Core Maths B (MEI)

3a. Forms of assessment

Scheme of assessment

Level 3 Certificate in Core Maths B (MEI) is a linear qualification with 100% external assessment comprising two timed written examination papers.

Paper 1

- 50% of the marks for the qualification covering the content of Introduction to Quantitative Reasoning.
- All questions are compulsory.
- One paper with six to nine questions set in a variety of contexts.

Paper 2

- 50% of the marks for the qualification covering the content of Statistical Problem Solving.
- All questions are compulsory.
- Section A: 3 to 4 questions, total 30 marks.
- Section B: 3 to 4 questions, total 30 marks.
- The questions in Section B will assume that learners are familiar with the pre-release data.

Learners must take both of the papers in the same series.

At the time of setting, each examination paper will be designed so that 45–55% of the marks are available to E grade learners, 70–80% to C grade and 100% to A grade. Learners are not expected to gain all the marks available to them in order to achieve the grade; in timed written examinations, their performance is likely to fall below the performance they are capable of when given the sort of time they will have when solving and reflecting on authentic problems in future life and study.

Appropriate and efficient use of technology

The use of calculators (scientific or graphical) will be assessed. Candidates will be expected to decide when it is appropriate to use a calculator. Calculations in authentic contexts are sometimes too complicated to be done without the use of a calculator. Some questions may ask learners to work without a calculator; in such cases no credit will be given for answers with insufficient working. Questions may include printouts from spreadsheets which learners will need to complete or interpret.

Mathematical Formulae and Statistical Tables

All formulae which learners are required to know are either detailed in the specification content or should be known from GCSE.

Any other formulae required will be given in the assessment.

A booklet (ST1) containing Mathematical Formulae and Statistical Tables is available for the use of learners in H869/02, Statistical Problem Solving examination.

Details of the mathematical notation that will be used in question papers are contained in Appendix 5c.

3b. Assessment Objectives (AO)

There are three assessment objectives in OCR Level 3 Certificate in Core Maths B (MEI) and these are detailed in the table below. Learners are expected to demonstrate their ability to:

	Assessment Objective
AO1	**Use and apply standard techniques** • recall, select and use mathematical techniques accurately • use and interpret notation correctly • carry out routine procedures including tasks requiring multi-step solutions.
AO2	**Solve problems in authentic contexts** • structure a solution to a problem where the method is not obvious • identify the important variables/features in a situation • use and develop mathematical models of authentic situations • understand that these models may be more or less effective depending on how the situation has been simplified.
AO3	**Reason, interpret and communicate mathematically** • interpret results in the context of the given problem • evaluate methods used and results obtained • make deductions, inferences and draw conclusions from quantitative information • interpret and communicate information accurately • explain mathematical reasoning and conclusions • assess the validity of an argument and evaluate a given way of presenting information.

3c. Total qualification time

Total qualification time (TQT) is the total amount of time, in hours, expected to be spent by a learner to achieve a qualification. It includes both guided learning hours and hours spent in preparation, study, and assessment. The total qualification time for Core Maths B is 180 hours. The total guided learning time is 180 hours.

3d. Qualification availability outside of England

This qualification is available in England. For Wales and Northern Ireland please check the Qualifications in Wales Portal (QIW) or the Northern Ireland Department of Education Performance Measures / Northern Ireland Entitlement Framework Qualifications Accreditation Number (NIEFQAN) list to see current availability.

3e. Language

This qualification is available in English only. All assessment materials are available in English only and all candidate work must be in English.

3f. Assessment availability

There will be one examination series available each year in May/June to **all** learners. Learners must take both components in the same series. This qualification will be certificated from the June 2016 examination series onwards.

AO weightings in Level 3 Certificate in Core Maths B (MEI)

The relationship between the assessment objectives and the components is shown in the following table:

Component	% of Level 3 Certificate in Core Maths B (MEI)			
	AO1	AO2	AO3	Total
Introduction to Quantitative Reasoning (H869/01)	12.5–14.5%	17.5–22.5%	15–17.5%	50%
Statistical Problem Solving (H869/02)	12.5–14.5%	17.5–22.5%	15–17.5%	50%
	25–29%	35–45%	30–35%	100%

3g. Retaking the qualification

Learners can retake the qualification. They must retake both components of the qualification.

3h. Assessment of extended responses

The assessment materials for this qualification provide learners with the opportunity to demonstrate their ability to construct and develop a sustained and coherent line of reasoning and marks for extended responses are integrated into the marking criteria.

When solving problems using mathematics and statistics in future life, work and study, learners will sometimes be expected to work on a problem with little or no guidance about a suitable method of solution. It is a feature of this qualification that learners are expected to work on such problems during the course and some of the questions in examinations will require them to structure an approach and communicate a solution to a problem without guidance on how to proceed. They will need to be able to select the relevant information and to make use of their own knowledge in order to do so. Learners will sometimes be required to make and use assumptions in order to proceed, using the experience, knowledge and understanding gained during the course. When marking such questions, some credit will be given to learners who have used and communicated a reasonable approach, even if this is incomplete or an error is made.

More marks are available in the Introduction to Quantitative Reasoning paper than in the Statistical Problem Solving paper, because learners need additional time to interpret contexts and formulate their strategies in the Statistical Problem Solving paper. This also requires a higher level of synoptic thinking. Each paper counts for 50% of the final weighted mark.

3i. Synoptic assessment

- Synoptic assessment allows learners to demonstrate their understanding of different aspects of mathematics.
- Synoptic assessment involves the explicit drawing together of knowledge, skills and understanding from different aspects of the course. The emphasis of synoptic assessment is to encourage the understanding of mathematics as a discipline and as a way of addressing a variety of authentic problems.
- Synoptic assessment allows learners to demonstrate the understanding they have acquired from the course as a whole and their ability to integrate and apply that understanding. This level of understanding is needed for successful use of the knowledge and skills from this course in future life, work and study.
- Learners are required to know and understand the content of the whole course in the Statistical Problem Solving paper and make use of their GCSE knowledge in both papers.
- In both the examination papers, learners will be required to integrate and apply their understanding in order to address authentic problems which require both breadth and depth of understanding in order to reach a satisfactory solution.
- Learners will be expected to reflect on and interpret solutions, drawing on their understanding of different aspects of the course.

3j. Calculating qualification results

A learner's overall qualification grade for the Level 3 Certificate in Core Maths B (MEI) will be calculated by adding together their marks for the first component and their weighted marks for the second component to give their total weighted mark. This total weighted mark will then be compared to the qualification level grade boundaries for the relevant exam series to determine the learner's overall qualification grade.

4 Admin: what you need to know

The information in this section is designed to give an overview of the processes involved in administering this qualification so that you can speak to your exams officer. All of the following processes require you to submit something to OCR by a specific deadline.

More information about the processes and deadlines involved at each stage of the assessment cycle can be found in the Administration area of the OCR website. OCR's *Admin overview* is available on the OCR website at http://www.ocr.org.uk/administration.

4a. Pre-assessment

Estimated entries

Estimated entries are your best projection of the number of learners who will be entered for a qualification in a particular series. Estimated entries should be submitted to OCR by the specified deadline.

They are free and do not commit your centre in any way.

Final entries

Final entries provide OCR with detailed data for each learner, showing each assessment to be taken. It is essential that you use the correct entry code, considering the relevant entry rules.

Final entries must be submitted to OCR by the published deadlines or late entry fees will apply.

All learners taking the Level 3 Certificate in Core Maths B (MEI) must be entered for H869.

Entry code	Title	Component code	Component title	Assessment type
H869	Level 3 Certificate in Core Maths B (MEI)	01	Introduction to Quantitative Reasoning	External Assessment
		02	Statistical Problem Solving	External Assessment

Entry exclusions

Learners cannot be entered for H869 Level 3 Certificate in Core Maths B (MEI) in the same examination series as H868 Level 3 Certification in Core Maths A (MEI).

Collecting evidence of student performance to ensure resilience in the qualifications system

Regulators have published guidance on collecting evidence of student performance as part of long-term contingency arrangements to improve the resilience of the qualifications system. You should review and consider this guidance when delivering this qualification to students at your centre.

For more detailed information on collecting evidence of student performance please visit our website at: https://www.ocr.org.uk/administration/general-qualifications/assessment/

4b. Access arrangements and special consideration

Reasonable adjustments and access arrangements allow learners with special educational needs, disabilities or temporary injuries to access the assessment and show what they know and can do, without changing the demands of the assessment. Applications for these should be made before the examination series. Detailed information about eligibility for access arrangements can be found in the JCQ *Access Arrangements and Reasonable Adjustments*.

Special consideration is a post-assessment adjustment to marks or grades to reflect temporary injury, illness or other indisposition at the time the assessment was taken.

Detailed information about eligibility for special consideration can be found in the JCQ *A guide to the special consideration process*.

4c. External assessment arrangements

Regulations governing examination arrangements are contained in the JCQ publication *Instructions for conducting examinations*.

Learners are permitted to use a scientific or graphical calculator for components 01 and 02. Calculators are subject to the rules in the document *Instructions for Conducting Examinations* published annually by JCQ (**www.jcq.org.uk**).

Head of Centre Annual Declaration

The Head of Centre is required to provide a declaration to the JCQ as part of the annual NCN update, conducted in the autumn term, to confirm that the centre is meeting all of the requirements detailed in the specification.

Any failure by a centre to provide the Head of Centre Annual Declaration will result in your centre status being suspended and could lead to the withdrawal of our approval for you to operate as a centre.

Private candidates

Private candidates may enter for OCR assessments.

A private candidate is someone who pursues a course of study independently but takes an examination or assessment at an approved examination centre. A private candidate may be a part-time student, someone taking a distance learning course, or someone being tutored privately. They must be based in the UK.

Private candidates need to contact OCR approved centres to establish whether they are prepared to host them as a private candidate. The centre may charge for this facility and OCR recommends that the arrangement is made early in the course.

Further guidance for private candidates may be found on the OCR website: **http://www.ocr.org.uk**

4d. Results and certificates

Grade scale

Level 3 Certificate in Core Maths B (MEI) is awarded on a scale A, B, C, D and E. Grades are indicated on certificates.

However, results for learners who fail to achieve the minimum grade for the qualification will be recorded as *unclassified* (U) and this is not certificated.

Results

Results are released to centres and learners for information and to allow any queries to be resolved before certificates are issued.

Centres will have access to the following results information for each learner:

- the grade for the qualification
- the raw mark for each component
- the total weighted mark for the qualification.

The following supporting information will be available:

- weighted mark grade boundaries for the qualification.

Until certificates are issued, results are deemed to be provisional and may be subject to amendment. A learner's final results will be recorded on an OCR certificate.

The qualification title will be shown as 'OCR Level 3 Certificate in Core Maths B (MEI)'.

4e. Post-results services

A number of post-results services are available:

- **Review of results** – If you are not happy with the outcome of a learner's results, centres may request a review of marking.
- **Missing and incomplete results** – This service should be used if an individual subject result for a learner is missing, or the learner has been omitted entirely from the results supplied.
- **Access to scripts** – Centres can request access to marked scripts.

4f. Malpractice

Any breach of the regulations for the conduct of examinations and coursework may constitute malpractice (which includes maladministration) and must be reported to OCR as soon as it is detected.

Detailed information on malpractice can be found in the JCQ publication, *Suspected Malpractice in Examinations and Assessments*: *Policies and Procedures.*

5 Appendices

5a. Overlap with other qualifications

Component H869/01 – Introduction to Quantitative Reasoning is the same as Component H868/01 in Level 3 Certificate in Core Maths A (MEI).

5b. Avoidance of bias

Level 3 qualifications have been reviewed in order to identify any feature which could disadvantage learners who share a protected Characteristic as defined by the Equality Act 2010. All reasonable steps have been taken to minimise any such disadvantage.

5c. Mathematical Notation

1 Miscellaneous Symbols	
$=$	is equal to
$\neq$	is not equal to
$\approx$	is approximately equal to
$\propto$	is proportional to
$<$	is less than
$\leqslant$	is less than or equal to, is not greater than
$>$	is greater than
$\geqslant$	is greater than or equal to, is not less than
∞	infinity
2 Operations	
$a + b$	a plus b
$a - b$	a minus b
$a \times b$, ab, $a.b$	a multiplied by b
$a \div b$, $\frac{a}{b}$, a/b	a divided by b
$\sqrt{a}$	the positive square root of a
$\sum_{i=1}^{n} a_i$	$a_1 + a_2 + a_3 + \ldots + a_n$

3 Probability and Statistics	
$x_1, x_2, \ldots$	observations
$f_1, f_2, \ldots$	frequencies with which the observations $x_1, x_2, \ldots$ occur
$N(\mu, \sigma^2)$	Normal distribution with mean μ and variance σ^2
μ	population mean
σ^2	population variance
σ	population standard deviation
$\bar{x}$	sample mean
$s^2, \hat{\sigma}^2$	unbiased estimate of population variance from a sample
ϕ	probability density function of the standardised Normal variable with distribution N(0,1)
Φ	corresponding cumulative distribution function
ρ	product moment correlation coefficient for a population
r	product moment correlation coefficient for a sample

5d. Technical terms

The term 'authentic' is included in the Core Maths Technical Guidance document published by the DfE in July 2014.

"Core Maths qualifications should consolidate and build on students' mathematical understanding and develop further mathematical understanding and skills in the application of maths to authentic problems, thereby offering progression from GCSE mathematics."

Representing and analysing 'authentic' situations is described in that document.

"Use a variety of mathematical and statistical approaches to represent and analyse relatively well-defined situations, including complex and unfamiliar situations. This includes identifying and understanding quantifiable information and related assumptions in that situation, using mathematical and statistical representations and techniques appropriately, and deriving new information to draw meaningful conclusions about the situation.

Situations and problems should be drawn from physical/technical/scientific and human/behavioural/social domains and reflect a range of contexts including professional and academic settings."

Summary of updates

Date	Version	Section	Title of section	Change
May 2018	1.1	Front cover	Disclaimer	Addition of disclaimer
July 2019	2.0	Throughout	Multiple	Change of qualification code and title to H869 Core Maths B (MEI)
March 2020	2.1	1.d 4.e	How do I find out more information? Post-results services	Inclusion of Teacher Support Centre Enquiry about results changed to Review of results.
February 2021	2.2	Cover		Update to specification covers to meet digital accessibility standards
April 2023	2.3	3.c 5.d	Total qualification time Guided learning hours (GLH)	Insertion of new section Deletion of section
January 2024	2.4	3d, 3e 4a Checklist	Qualification availability, Language Pre-assessment	Inclusion of disclaimer regarding language and availability Update to include resilience guidance Inclusion of Teach Cambridge

YOUR CHECKLIST

Our aim is to provide you with all the information and support you need to deliver our specifications.

- ☐ Bookmark OCR website for all the latest information and news on Level 3 Certificate Core Maths B (MEI)
- ☐ Sign up for Teach Cambridge: our personalised and secure website that provides teachers with access to all planning, teaching and assessment support materials
- ☐ Be among the first to hear about support materials and resourcesas they become available – register for Level 3 Certificate Core Maths B (MEI)
- ☐ Find out about our professional development
- ☐ View our range of skills guides for use across subjects and qualifications
- ☐ Discover our new online past paper service
- ☐ Learn more about Active Results
- ☐ Visit our Online Support Centre

Download high-quality, exciting and innovative Level 3 Certificate in Core Maths B (MEI) resources from ocr.org.uk/coremaths

Resources and support for our Level 3 Certificate in Core Maths B (MEI) qualification, developed through collaboration between our Maths Subject Advisors, teachers and other subject experts, are available from our website. You can also contact our Maths Subject Advisors who can give you specialist advice, guidance and support.

Contact the team at:

01223 553998

maths@ocr.org.uk

@OCR_Maths

To stay up to date with all the relevant news about our qualifications, register for email updates at **ocr.org.uk/updates**

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