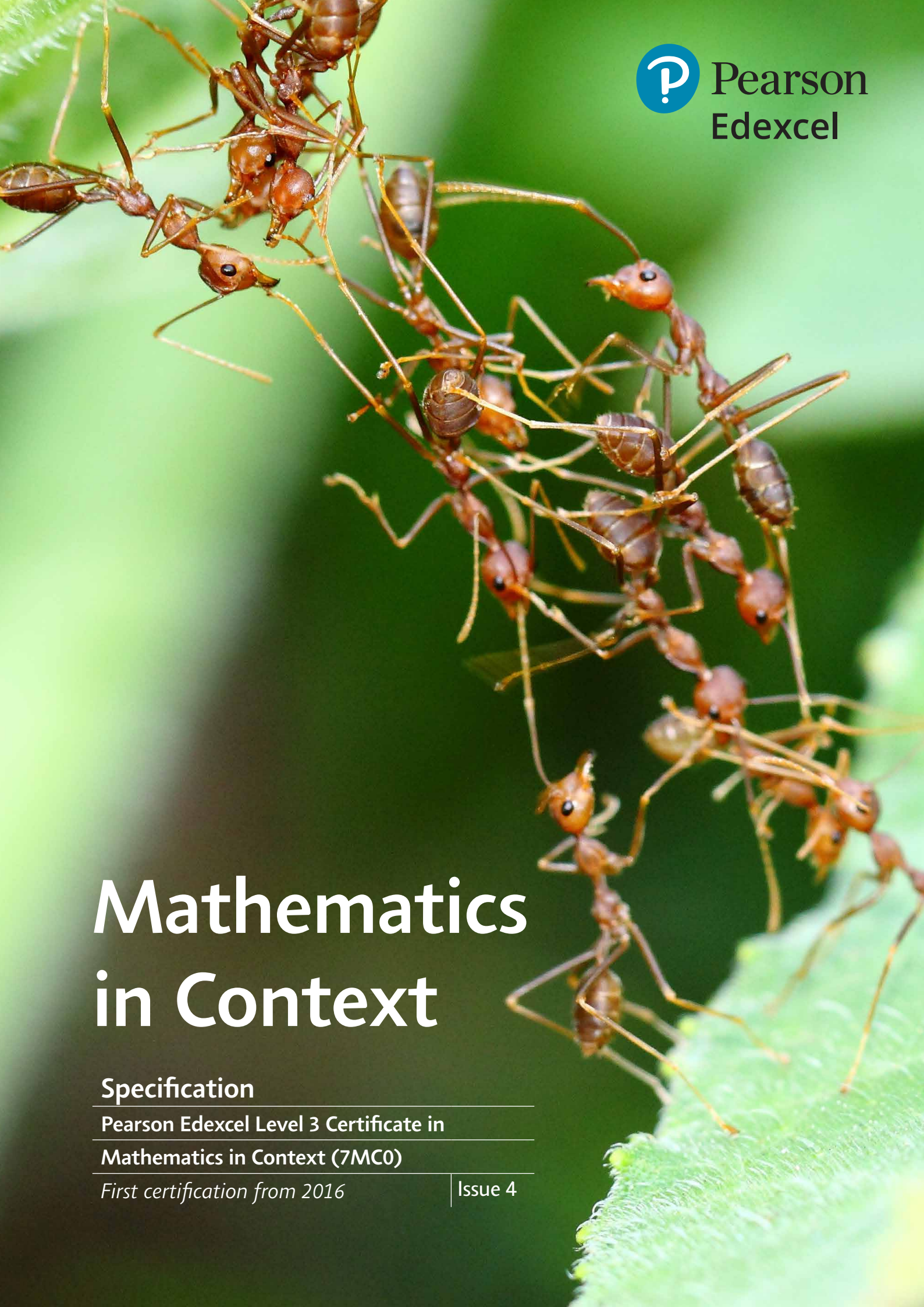

Pearson Edexcel

Mathematics in Context

Specification

Pearson Edexcel Level 3 Certificate in Mathematics in Context (7MC0)

First certification from 2016

Issue 4

About Pearson

We are the world's leading learning company operating in countries all around the world. We provide content, assessment and digital services to learners, educational institutions, employers, governments and other partners globally. We are committed to helping equip learners with the skills they need to enhance their employability prospects and to succeed in the changing world of work. We believe that wherever learning flourishes so do people.

Cover photograph: grass-lifeisgood/getty images

Publication code: GQ000037

Summary of Pearson Edexcel Level 3 Certificate in Mathematics in Context Specification Issue 4 changes

Summary of changes made between previous issue and this current issue	Page number
The following text has been added to the *Qualification at a glance* section, underneath the GLH sentence: The total number of hours a learner is expected to take to complete the qualification to the required standard (TQT) is 180.	1
The *UK Information Manual in Entry and Assessment information* has been replaced with the following text underneath *student entry*: Mathematics in Context (L3 Core Maths) Information Manual.	13
The entire *Awarding and reporting* section has been updated.	16
In the *Prior learning* section, 'grade C' has been changed to 'grade 4'.	18

Earlier issues show previous changes.

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Introduction

The Pearson Edexcel Level 3 Certificate in Mathematics in Context is designed for use in schools and colleges.

Purpose of the specification

This specification sets out:

- the objectives of the qualification
- any other qualifications that a student must have completed before taking the qualification
- any prior knowledge and skills that the student is required to have before taking the qualification
- any other requirements that a student must have satisfied before they will be assessed or before the qualification will be awarded
- the knowledge and understanding that will be assessed as part of the qualification
- the method of assessment and any associated requirements relating to it
- the criteria against which a student's level of attainment will be measured (such as assessment criteria).

Rationale

The Pearson Edexcel Level 3 Certificate in Mathematics in Context meets the following purposes, which fulfil those defined by the Department for Education (DfE) in their *Core Maths qualifications: Technical guidance* document, published in July 2014.

The purposes of this qualification are to:

- consolidate and build on students' mathematical understanding, and develop further mathematical understanding and skills in the application of mathematics to authentic problems
- build a broader base of mathematical understanding and skills in order to support the mathematical content in other Level 3 qualifications, for example GCE A Level Biology, Business Studies, Economics, Computing, Geography, Psychology, BTEC Applied Science, Business, Health and Social Care, IT
- provide evidence of students' achievements against demanding and fulfilling content, to give them the confidence that the mathematical skills, knowledge and understanding they will acquire during the course of their study are as good as that of the highest-performing jurisdictions in the world
- prepare students for the range of varied contexts that they are likely to encounter in vocational and academic study, future employment and life.

Qualification aims and objectives

The aims and objectives of the Pearson Edexcel Level 3 Certificate in Mathematics in Context are to enable students to:

- develop competence in the selection and use of mathematical methods and techniques
- develop confidence in representing and analysing authentic situations mathematically, and in applying mathematics to address related questions and issues
- build skills in mathematical thinking, reasoning and communication.

The context for the development of this qualification

All our qualifications are designed to meet our World Class Qualification principles[1] and our ambition to put the student at the heart of everything we do.

We have developed and designed this qualification by:

- reviewing other curricula and qualifications to ensure that it is comparable with those taken in high-performing jurisdictions overseas
- consulting with key stakeholders on content and assessment, including subject associations, higher education academics, teachers and employers to ensure that the qualification is suitable in a UK context.

Additionally, the qualification has been developed to meet criteria stipulated by the DfE in their *Core Maths qualifications: Technical guidance* document, published in July 2014.

[1] Pearson's World Class Qualification principles ensure that our qualifications are:

- **demanding**, through internationally benchmarked standards, encouraging deep learning and measuring higher-order skills
- **rigorous**, through setting and maintaining standards over time, developing reliable and valid assessment tasks and processes, and generating confidence in end users of the knowledge, skills and competencies of certified students
- **inclusive**, through conceptualising learning as continuous, recognising that students develop at different rates and have different learning needs, and focusing on progression
- **empowering**, through promoting the development of transferable skills, see *Appendix 1*.

Contents

Qualification at a glance

The Pearson Edexcel Level 3 Certificate in Mathematics in Context consists of two externally examined papers.

The total number of guided learning hours (GLH) for this qualification is 180.

The total number of hours a learner is expected to take to complete the qualification to the required standard (TQT) is 180.

The qualification is graded and certificated on a five-grade scale from A (the highest) to E (the lowest).

Students must complete both papers in May/June in any single year.

Paper 1: Comprehension	***Paper code: 7MC0/01**
• Externally assessed • Availability: May/June • First assessment: 2016	**40% of the total qualification**
Overview of content This paper will examine the following content areas: • applications of statistics • probability • linear programming • sequences and growth.	
Overview of assessment • Written examination paper with two sections, A and B, and a source booklet. • The source booklet will detail two real-life contexts. These contexts will be assessed in the written paper, which requires students to comprehend, interpret and analyse the content in order to answer the questions. One context will be assessed in Section A and the other context will be assessed in Section B. Students will need to refer to the source booklet when answering the questions. • The source booklet will be available for centres to download from our website (qualifications.pearson.com) no later than 15 April for the examinations in May/June of that year. A 'clean' copy will be provided in the examination. Students must not bring their copy into the examination. • A calculator is allowed. • Assessment duration is 1 hour and 40 minutes. • The paper consists of 60 marks. • A formulae sheet is given at the front of the source booklet and in *Appendix 3.*	

Paper 2: Applications	***Paper code: 7MC0/02**
• Externally assessed • Availability: May/June • First assessment: 2016	**60% of the total qualification**

Overview of content

This paper will examine the following content areas:

- applications of statistics
- probability
- linear programming
- sequences and growth.

Overview of assessment

- Written examination paper with two sections, A and B, and a source booklet.
- The source booklet will detail one themed task in Section A – this will be the same as one of the contexts provided in Paper 1. Students will need to refer to the source booklet when answering the question. Section B will contain three tasks, each of which has a separate theme. The four themes will be assessed in the written paper, which requires students to apply their problem-solving skills in order to answer the questions.
- A calculator is allowed.
- The assessment duration is 1 hour and 40 minutes.
- The paper consists of 80 marks.
- A formulae sheet is given at the front of the source booklet and in Appendix 3.

*See *Appendix 2: Codes* for a description of this code and all other codes relevant to this qualification.

Knowledge, skills and understanding

Overview

The content areas covered in this qualification (across both papers) are:

- applications of statistics
- probability
- linear programming
- sequences and growth.

Each of these content areas can be assessed in either Paper 1 or Paper 2 or in both Papers 1 and 2. Students should be prepared in all four content areas for both papers.

Content

The content of this qualification is drawn from a range of GCSE content areas predominantly: statistics, probability, algebra and ratio, proportion and rates of change, together with 20% of content drawn from beyond and above GCSE content.

1 Applications of statistics

Statistics is the study of the collection, organisation, analysis, interpretation and presentation of data. It plays an increasingly important role in life, study and employment in a wide variety of contexts. It is important to be comfortable and confident in dealing with real data. It is used in areas of study such as actuarial science, biology, business and economics, IT and psychology.

Students should be able to:

A1 infer properties of populations or distributions from a sample, while knowing the limitations of sampling

A2 interpret and construct tables and line graphs for time series data; calculate, interpret and use moving averages

A3 construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and use them appropriately

A4 interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation, including box plots

A5 interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency, including quartiles, inter-quartile range, calculate and use variance and standard deviation

A6 recognise correlation and know that it does not indicate causation

A7 apply and interpret explanatory (independent) and response (dependent) variables, interpolate and extrapolate apparent trends while knowing the dangers of doing so

A8 draw estimated lines of best fit and make predictions; use and interpret the product moment correlation coefficient, recognising its limitations

A9 use, apply and interpret linear regression; calculate the equation of a linear regression line using the method of least squares (candidates may be asked to draw this regression line on a scatter diagram)

A10 use, apply and interpret Spearman's rank; calculate Spearman's rank correlation coefficient and use it as a measure of agreement or for comparisons of the degree of correlation (tied ranks may be tested in the examination papers).

2 Probability

Probability is used to determine a numerical value for the chance or risk of events happening. Probability theory has made significant contributions to almost all branches of science and engineering over the last 100 years. Probability is used in areas of study such as finance, science, artificial intelligence, business, computer science and philosophy.

Students should be able to:

P1 understand and demonstrate that empirical unbiased samples tend towards theoretical probability distributions, as sample size increases

P2 enumerate sets and combinations of sets systematically using tree diagrams

P3 calculate the probability of independent and dependent combined events, including sampling with and without replacement, using tree diagrams and other representations, Venn diagrams, sum and product laws

P4 calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams

P5 understand, use and interpret probability notation, its application to Venn diagrams, exclusive and complementary events, independence of two events and conditional probability

P6 understand, interpret and use appropriately the following formulae: $P(A') = 1 - P(A)$; $P(A \cup B) = P(A) + P(B) - P(A \cap B)$; $P(A \cap B) = P(A)P(B|A)$; $P(B|A) = P(B)$ and $P(A|B) = P(A)$; $P(A \cap B) = P(A)P(B)$

P7 understand and interpret risk as the probability of something happening multiplied by the resulting cost or benefit if it does; comparison of levels of risk; application of risk to real-life contexts such as finance, insurance and trading.

3 Linear programming

This is a problem-solving approach to achieve the best outcome (such as maximum profit or lowest cost) through consideration of conditions that can be modelled by linear relationships.

Linear programming can be applied to a variety of contexts in business and industry. It is used most extensively in business and economics but is also utilised for some engineering problems. Linear programming models are used in industries such as transportation, energy, telecommunications and manufacturing. Linear programming has proved useful in modelling diverse types of problems in planning, routing, scheduling, task assignment and design.

Students should be able to:

LP1 translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution

LP2 plot graphs of equations that correspond to straight line graphs in the coordinate plane; use the form $y = mx + c$ to identify parallel lines; find the equation of the line through two given points, or through one point with a given gradient

LP3 recognise, sketch and interpret graphs of linear functions

LP4 solve algebraically linear equations in one unknown with the unknown on both sides of the equation

LP5 solve two simultaneous equations in two variables (linear/linear) algebraically; find approximate solutions using a graph

LP6 solve linear inequalities in one variable, representing the solution on a number line using set notation

LP7 solve linear inequalities in two variables, representing the solution on a graph

LP8 use algebra to support and construct arguments

LP9 formulate problems as linear programs with up to three variables

LP10 solve and interpret two-variable problems graphically, using ruler and vertex methods

LP11 consider problems where solutions must have integer values.

4 Sequences and growth

A mathematical understanding of sequences, growth and decay can be applied to a variety of real-life contexts and problem-solving tasks, including financial mathematics, population growth, epidemics, earthquakes and radioactive decay.

Students should be able to:

SG1 set up, solve and interpret the answers to growth and decay problems, including compound interest

SG2 calculate simple interest and compound interest; use and interpret graphical representation of simple and compound interest

SG3 recognise, sketch and interpret graphs of quadratic functions, reciprocal functions, polynomial functions of the form $y = x^n$ and exponential functions $y = k^x$ for positive values of k

SG4 interpret the gradient at a point on a curve as the instantaneous rate of change and apply the concepts of average and instantaneous rates of change (gradients of chords and tangents) in numerical and graphical contexts

SG5 calculate with roots, and with integer and fractional indices

SG6 recognise and interpret linear and quadratic sequences; deduce expressions to calculate the nth term of linear and quadratic sequences

SG7 recognise, use and interpret sequences, including those given by a formula for the nth term, those generated by a simple relation of the form $x_{n+1} = \mathrm{f}(x_n)$, Fibonacci sequences and the golden ratio

SG8 understand and use sigma notation

SG9 recognise, use and interpret arithmetic series, including the general term of an arithmetic series and the sum to n terms of an arithmetic series

SG10 recognise, use and interpret geometric series, including the general term of a geometric series, the sum to n terms of a geometric series and the sum to infinity of a convergent geometric series including the use of $|r| < 1$.

Assessment

Assessment summary

Summary of table of assessment

Students must complete both papers in May/June in any single year.

Paper 1: Comprehension	***Paper code: 7MC0/01**
• Externally assessed • Availability: May/June • First assessment: 2016	**40% of the total qualification**
Overview of content This paper will examine the following content areas: • applications of statistics • probability • linear programming • sequences and growth.	
Overview of assessment • Written examination paper with two sections, A and B, and a source booklet. • The source booklet will detail two real-life contexts. These contexts will be assessed in the written paper, which requires students to comprehend, interpret and analyse the content in order to answer the questions. One context will be assessed in Section A and the other context will be assessed in Section B. Students will need to refer to the source booklet when answering the questions. • The source booklet will be available for centres to download from our website (qualifications.pearson.com) no later than 15 April for the examinations in May/June of that year. A 'clean' copy will be provided in the examination. Students must not bring their copy into the examination. • A calculator is allowed. • Assessment duration is 1 hour and 40 minutes. • The paper consists of 60 marks. • A formulae sheet is given at the front of the source booklet and in *Appendix 3.*	

Paper 2: Applications	***Paper code: 7MC0/02**
• Externally assessed • Availability: May/June • First assessment: 2016	**60% of the total qualification**

Overview of content

This paper will examine the following content areas:

- applications of statistics
- probability
- linear programming
- sequences and growth.

Overview of assessment

- Written examination paper with two sections, A and B, and a source booklet.
- The source booklet will detail one themed task in Section A – this will be the same as one of the contexts provided in Paper 1. Students will need to refer to the source booklet when answering the question. Section B will contain three tasks, each of which has a separate theme. The four themes will be assessed in the written paper, which requires students to apply their problem-solving skills in order to answer the questions.
- A calculator is allowed.
- The assessment duration is 1 hour and 40 minutes.
- The paper consists of 80 marks.
- A formulae sheet is given at the front of the source booklet and in *Appendix 3*.

The sample assessment materials can be found in the *Pearson Edexcel Level 3 Certificate in Mathematics in Context Sample Assessment Materials* document.

*See *Appendix 2: Codes* for a description of this code and all other codes relevant to this qualification.

Assessment Objectives and weightings

Students must:		% for the qualification
AO1	**Use a range of mathematical methods and techniques, including using contemporary calculator technology and knowledge and use of a spreadsheet, to find solutions to mathematical and non-mathematical problems.** Students should be able to: • make decisions about which methods and techniques are best used to understand and address specific problems • use techniques correctly to generate answers and solutions • interpret and explain answers and solutions in the context of the problem.	25–29
AO2	**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.** Students should be able to: • address authentic issues and questions by applying mathematical approaches with purpose to generate solutions, insights and answers • evaluate the relevance of solutions in the context of the situation, establish how they can be used and communicate findings accurately and meaningfully.	30–40
AO3	**Generate and apply mathematical solutions to non-routine questions and problems taking creative approaches where appropriate, and test and evaluate answers and conclusions.** Students should be able to: • make judgements about strategies and methods to achieve a solution • interpret new situations in terms of mathematical and quantitative characteristics • explain mathematical reasoning and conclusions to others and justify specific approaches taken to the problem. Interpret conclusions on the basis of mathematical understanding and explain limitations to answers and conclusions.	30–40
	Total	**100%**

Breakdown of Assessment Objectives

Paper	AO1	AO2	AO3	Total for all Assessment Objectives
Paper 1: Comprehension	10–16%	10–16%	10–16%	40%
Paper 2: Applications	9–18%	18–29%	18–29%	60%
Total for this qualification	**25–29%**	**30–40%**	**30–40%**	**100%**

Entry and assessment information

Student entry

Details of how to enter students for the examinations for this qualification can be found in our *Mathematics in Context (L3 Core Maths) Information Manual.* A copy is made available to all examinations officers and is available on our website at: https://qualifications.pearson.com/en/support/support-for-you/exam-officers-administrators/entries-information-manual.html.

Forbidden combinations and discount code

Students should be advised that, if they take two qualifications with the same discount code, schools and colleges to which they wish to progress are likely to take the view that they have achieved only one of them. The same view may be taken if students take two Level 3 qualifications that have different discount codes but significant overlap of content. Students or their advisers who have any doubts about their subject combinations should check with the institution to which they wish to progress before embarking on their programmes.

Access arrangements, reasonable adjustments, special consideration and malpractice

Access arrangements

Access arrangements are agreed before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

The intention behind an access arrangement is to meet the particular needs of an individual student with a disability without affecting the integrity of the assessment. Access arrangements are the principal way in which awarding organisations comply with the duty under the Equality Act 2010 to make 'reasonable adjustments'.

Access arrangements should always be processed at the start of the course. Students will then know what is available and can arrange to have the access arrangement(s) in place for assessment.

Reasonable adjustments

The Equality Act 2010 requires an awarding organisation to make reasonable adjustments where a person with a disability would be at a substantial disadvantage in undertaking an assessment. The awarding organisation is required to take reasonable steps to overcome that disadvantage.

A reasonable adjustment for a particular person may be unique to that individual and, therefore, might not be in the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, these include:

- the needs of the student with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the student with the disability and other students.

An adjustment will not be approved if it involves unreasonable costs to the awarding organisation, affects timeframes or affects the security or integrity of the assessment. This is because the adjustment is not 'reasonable'.

Special consideration

Special consideration is a post-examination adjustment to a student's mark or grade to reflect temporary injury, illness or other indisposition at the time of the examination/assessment, which has had, or is reasonably likely to have had, a material effect on a candidate's ability to take an assessment or demonstrate their level of attainment in an assessment.

Further information

For further information about how to apply for access arrangements and special consideration please see our policy document *Access Arrangements, Reasonable Adjustments and Special Consideration*, on our website at: https://qualifications.pearson.com/en/support/support-topics/exams/special-requirements.html.

For general information about access arrangements, reasonable adjustments and special consideration please go to the JCQ website: www.jcq.org.uk.

Candidate malpractice

Candidate malpractice refers to any act by a candidate that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

Candidate malpractice in examinations **must** be reported to Pearson using a *JCQ M1 Form* (available at www.jcq.org.uk/exams-office/malpractice). The form can be emailed to pqsmalpractice@pearson.com. Please provide as much information and supporting documentation as possible. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

Staff/centre malpractice

Staff and centre malpractice includes both deliberate malpractice and maladministration of our qualifications. As with candidate malpractice, staff and centre malpractice is any act that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

All cases of suspected staff malpractice and maladministration **must** be reported immediately, before any investigation is undertaken by the centre, to Pearson on a *JCQ M2(a) Form* (available at www.jcq.org.uk/exams-office/malpractice). The form, supporting documentation and as much information as possible can be emailed to pqsmalpractice@pearson.com. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice itself constitutes malpractice.

More-detailed guidance on malpractice can be found in the latest version of the document *JCQ General and Vocational Qualifications Suspected Malpractice in Examinations and Assessments,* available at www.jcq.org.uk/exams-office/malpractice.

Equality Act 2010 and Pearson equality policy

Equality and fairness are central to our work. Our equality policy requires all students to have equal opportunity to access our qualifications and assessments, and our qualifications to be awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Teachers can find details on how to make adjustments for students with protected characteristics in the policy document *Access Arrangements, Reasonable Adjustments and Special Consideration*, on our website at: https://qualifications.pearson.com/en/support/support-topics/exams/special-requirements.html.

Synoptic assessment

Synoptic assessment requires students to identify and use effectively, in an integrated way an appropriate selection of skills, techniques, concepts, theories, and knowledge from across the four content areas.

Synoptic assessment enables students to demonstrate their ability to comprehend, interpret and analyse mathematical content and to apply their problem-solving skills across the full range of the four content areas.

In this qualification, synoptic assessment is found in both Paper 1 and Paper 2.

Awarding and reporting

This qualification will be graded, awarded and certificated to comply with the requirements of Ofqual's General Conditions of Recognition.

The raw marks for paper 2 in this qualification will be scaled by Pearson to represent the relative weighting of 40% for paper 1 and 60% for paper 2.

Paper	Weighting	Raw marks	Scaling factor	Scaling mark
1	40%	60	1.000	60
2	60%	80	1.125	90

This qualification will be graded and certificated on a five-grade scale A, B, C, D and E using the total subject mark where grade A is the highest grade.

Students whose level of achievement is below the minimum judged by Pearson to be of sufficient standard to be recorded on a certificate will receive an unclassified U result.

Language of assessment

Assessment of this qualification will be available in English. All student work must be in English.

Grade descriptors

The grade descriptors for this qualification can be found in *Appendix 5: Grade descriptors*.

Other information

Student recruitment

Pearson follows the JCQ policy concerning recruitment to our qualifications in that:

- they must be available to anyone who is capable of reaching the required standard
- they must be free from barriers that restrict access and progression
- equal opportunities exist for all students.

Prior learning

This qualification builds on the content, knowledge and skills set out in the statutory guidance *National curriculum in England: mathematics programmes of study* (DfE, July 2014).

Students beginning this Level 3 qualification are likely to have followed the current Key Stage 4 programme of study in mathematics. Although not a prerequisite for this qualification, it is recommended that, at the start of the course, students should have obtained at least grade 4 in GCSE mathematics or an equivalent Level 2 qualification.

Progression

This qualification is designed to encourage and support post-16 students who have already achieved at least grade 4 in GCSE mathematics or an equivalent Level 2 qualification to retain, develop and enhance their mathematical skills.

This qualification provides the mathematical skills to support students progressing to higher education to study subjects that 'use' mathematics including, for example, biology, business, geography, health and social care, nursing and psychology. Students planning to study more mathematically-based subjects, including mathematics, statistics and physics, will find that A Level mathematics is likely to be a requirement.

Pearson strongly advises those students who are planning to progress to higher education to check with universities to confirm if individual courses require A Level mathematics.

Appendices

Appendix 1: Transferable skills

The need for transferable skills

In recent years, higher education institutions and employers have consistently flagged the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as 'the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning.'[1]

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, we identified the National Research Council's (NRC) framework as the most evidence-based and robust skills framework. We adapted the framework slightly to include the Program for International Student Assessment (PISA) ICT Literacy and Collaborative Problem Solving (CPS) Skills.

The adapted National Research Council's framework of skills involves:[2]

Cognitive skills

- **Non-routine problem solving** – expert thinking, metacognition, creativity.
- **Systems thinking** – decision making and reasoning.
- **Critical thinking** – definitions of critical thinking are broad and usually involve general cognitive skills such as analysing, synthesising and reasoning skills.
- **ICT literacy** – access, manage, integrate, evaluate, construct and communicate[3].

Interpersonal skills

- **Communication** – active listening, oral communication, written communication, assertive communication and non-verbal communication.
- **Relationship-building skills** – teamwork, trust, intercultural sensitivity, service orientation, self-presentation, social influence, conflict resolution and negotiation.
- **Collaborative problem solving** – establishing and maintaining shared understanding, taking appropriate action, establishing and maintaining team organisation.

[1] OECD (2012), Better Skills, Better Jobs, Better Lives (2012):http://skills.oecd.org/documents/OECDSkillsStrategyFINALENG.pdf

[2] Koenig, J. A. (2011) Assessing 21st Century Skills: Summary of a Workshop, National Research Council

[3] PISA (2011) The PISA Framework for Assessment of ICT Literacy, PISA

Intrapersonal skills

- **Adaptability** – ability and willingness to cope with the uncertain, handling work stress, adapting to different personalities, communication styles and cultures, and physical adaptability to various indoor and outdoor work environments.
- **Self-management and self-development** – ability to work remotely in virtual teams, work autonomously, be self-motivating and self-monitoring, willing and able to acquire new information and skills related to work.

Transferable skills enable young people to face the demands of further and higher education, as well as the demands of the workplace, and are important in the teaching and learning of this qualification. We will provide teaching and learning materials, developed with stakeholders, to support our qualifications.

Appendix 2: Codes

Type of code	Use of code	Code number
Discount codes	Every qualification is assigned to a discount code indicating the subject area to which it belongs. This code may change. Please go to our website (qualifications.pearson.com) for details of any changes.	2350
National Qualifications Framework (NQF) codes	Each qualification title is allocated an Ofqual National Qualifications Framework (NQF) code. The NQF code is known as a Qualification Number (QN). This is the code that features in the DfE Section 96 and on the LARA as being eligible for 16–18 and 19+ funding and is to be used for all qualification funding purposes. The QN is the number that will appear on the student's final certification documentation.	The QN for the qualification in this publication is: 601/4857/3
Subject codes	The subject code is used by centres to enter students for a qualification. Centres will need to use the entry codes only when claiming students' qualifications.	7MC0
Paper codes	These codes are provided for reference purposes. Students do not need to be entered for individual papers.	Paper 1: 7MC0/01 Paper 2: 7MC0/02

Appendix 3: Formulae sheet

This formulae sheet will be provided at the front of both source booklets.

Mean of a frequency distribution $= \dfrac{\sum fx}{\sum f}$

Mean of a grouped frequency distribution $= \dfrac{\sum fx}{\sum f}$, where x is the mid-interval value

Variance $= \dfrac{\sum (x-\bar{x})^2}{n}$

Standard deviation (set of numbers) $\sqrt{\left[\dfrac{\sum x^2}{n} - \left(\dfrac{\sum x}{n}\right)^2\right]}$

or $\sqrt{\left[\dfrac{\sum (x-\bar{x})^2}{n}\right]}$

where $\bar{x}$ is the mean of the set of values

Standard deviation (discrete frequency distribution) $\sqrt{\left[\dfrac{\sum fx^2}{\sum f} - \left(\dfrac{\sum fx}{\sum f}\right)^2\right]}$

or $\sqrt{\left[\dfrac{\sum f(x-\bar{x})^2}{\sum f}\right]}$

Spearman's rank correlation coefficient $1 - \dfrac{6\sum d^2}{n(n^2-1)}$

The product moment correlation coefficient is

$$r = \frac{S_{xy}}{\sqrt{S_{xx}S_{yy}}} = \frac{\sum x_i y_i - \frac{\left(\sum x_i\right)\left(\sum y_i\right)}{n}}{\sqrt{\left(\sum x_i^2 - \frac{\left(\sum x_i\right)^2}{n}\right)\left(\sum y_i^2 - \frac{\left(\sum y_i\right)^2}{n}\right)}}$$

The regression coefficient of y on x is $b = \frac{S_{xy}}{S_{xx}}$

Least squares regression line of y on x is $y = a + bx$ where $a = \overline{y} - b\overline{x}$

Arithmetic series

$$u_n = a + (n-1)d$$

$$S_n = \frac{1}{2}n\left(a + l\right) = \frac{1}{2}n\left[2a + \left(n-1\right)d\right]$$

Geometric series

$$u_n = ar^{n-1}$$

$$S_n = \frac{a\left(1 - r^n\right)}{1 - r}$$

$$S_\infty = \frac{a}{1-r} \text{ for } \left|r\right| < 1$$

Appendix 4: Technology skills identified for indirect assessment and developed through teaching and learning

It is expected that scientific calculators, including statistical functions, and spreadsheets will be used in the teaching and learning of this qualification.

Question papers will assess the following student abilities:

a) Use a scientific calculator

b) Know and understand how to use a spreadsheet including the following:

- enter data and formulae
- formulae based on the four operations e.g. =A2*(B6+B7)
- other standard formulae:

  =sum(A2:A10)

  =power(A2,3)

  =average(A2:A10)

  =median(A2:A10)

  =count(A2:A10)

- interpret graphs generated from spreadsheet data.

Appendix 5: Grade descriptors

The papers are assessed using a marks-based scheme. For each paper grade, boundaries based on students' performance will be set by us.

The following criteria are used in the setting and awarding of both papers.

Grade E

Students solve mathematical and non-mathematical problems by selecting and applying some mathematical methods and techniques to familiar situations. They can interpret and outline solutions, making some reference to the context of the problem. They select methods and techniques to understand and address specific problems although better alternatives may exist. They use some techniques, including using contemporary calculator technology and knowledge and use of spreadsheets, to generate correct answers and solutions to mathematical and non-mathematical problems.

Students use some mathematical and statistical approaches to represent and analyse relatively well-defined unfamiliar situations. They identify and understand some quantifiable information and some related assumptions to enable mathematical and statistical representations and techniques to be applied to situations. They derive some new information to draw limited conclusions about the situation. They generate basic solutions to situations using limited insight to address authentic issues and questions, and produce a limited evaluation of solutions in the context of situations, communicating their main findings in outline.

Students obtain mathematical solutions to straightforward, non-routine questions, demonstrating limited creativity in their approach. They carry out limited testing and evaluation of answers and conclusions.

Students make limited judgements about strategies and methods used to achieve a solution. They demonstrate some ability to interpret new situations in terms of mathematical and quantitative characteristics.

Students give a partial explanation of mathematical reasoning to reach a valid conclusion, including a restricted justification for the approach taken. They outline the limitations to answers and conclusions.

Grade A

Students solve mathematical and non-mathematical problems by using skills of discrimination to select and apply a wide range of mathematical methods and techniques to both familiar and unfamiliar situations. They can interpret and give a thorough explanation of a solution in the context of the problem. They select the most appropriate methods and techniques, including using contemporary calculator technology and knowledge and use of spreadsheets, to understand and address specific problems.

Students use the most appropriate techniques to generate correct answers and solutions to mathematical and non-mathematical problems. They interpret and explain clearly and in detail, answers and solutions in the context of mathematical and non-mathematical problems.

Students use appropriate mathematical and statistical approaches effectively to represent and analyse relatively well-defined situations, including complex and unfamiliar situations. They identify and understand all necessary quantifiable information and related assumptions to enable mathematical and statistical representations and techniques to be applied to situations.

Students derive sufficient new information to draw full conclusions about the situation. They generate full solutions to situations, using insight to address authentic issues and questions. They fully evaluate solutions in the context of situations, communicating their main findings in detail.

Students obtain mathematical solutions to non-routine questions, demonstrating creativity in their approach. They carry out appropriate testing and evaluation of answers and conclusions.

Students justify their judgements about strategies and methods used to achieve a solution. They demonstrate with clarity an ability to interpret new situations in terms of mathematical and quantitative characteristics.

Students give a clear, detailed explanation of mathematical reasoning to reach a valid conclusion, including a full justification for the approach taken. They explain in detail the limitations to answers and conclusions.

DB140623 GQ000037_L3_CERT_MATHS_CONTXT_ISS4.DOC.1-42/0

For information about Pearson Qualifications, including Pearson Edexcel, BTEC and LCCI qualifications visit qualifications.pearson.com

Pearson Education Limited. Registered in England and Wales No. 872828
Registered Office: 80 Strand, London WC2R 0RL

VAT Reg No GB 278 537121

Pearson
Edexcel