Edexcel Functional Skills Mathematics, Levels 1 & 2

Your complete delivery guide

Inside you'll find:

- **Planning, teaching and assessment guide**
  – with guidance and mapping charts showing ease of delivery within KS3 and GCSE.

- **Guide to the Specification and Sample and Assessment Materials 2010**
  – with callouts from the examiner providing you with insights and teaching tips.

- **Information on our new resources** – for teaching and revision.

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Edexcel Functional Skills

Mathematics, Levels 1 & 2
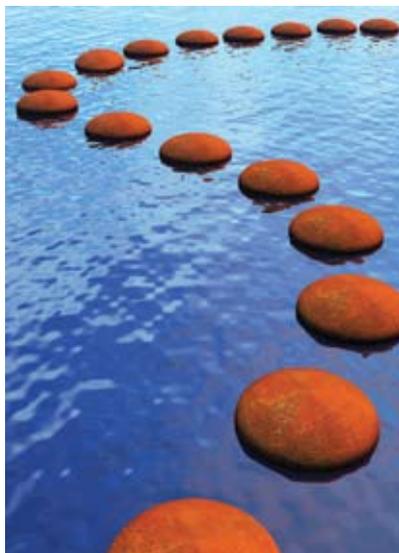
Welcome to your complete delivery guide

We are delighted to introduce you to the Edexcel Functional Skills Mathematics, Levels 1 & 2, Specification and Sample Assessment Materials. These have been developed from our extensive pilot and are designed to meet the needs of all candidates taking Functional Skills Mathematics, Levels 1 & 2, from September 2010.

Preparing to teach Functional Skills Mathematics from September 2010

In this guide you will find an overview of the new specifications, assessments and range of resources.

To help you implement Functional Skills Mathematics we have provided support for:

- **Planning:** making it easy to see where Functional Skills Mathematics are taught within GCSE and KS3, as well as planning for Functional Skills Mathematics as a stand-alone qualification
- **Teaching:** including a guide through the specification from experienced Functional Skills Mathematics examiners, teaching tips, and information about our resources
- **Assessment:** with guidance from our experienced examiners and insights into lessons learned from our extensive pilot, so you can be informed and help your students achieve their best.

Our ongoing free support will be available on our website **www.edexcel.com/fsmathematics**.

To view the accredited Specification and Sample Assessment Materials, please visit **www.edexcel.com/fs** and select **Mathematics (Levels 1 & 2)** from the subjects listed on the homepage.

We hope that you and your learners will benefit from our work with our pilot centres to develop engaging qualifications with clear, well-written papers that are accessible to all.

Contents

Introducing Functional Skills Mathematics from Edexcel

The Functional Skills Mathematics qualifications are designed to give learners the skills to operate confidently, effectively and independently in education, work and everyday life. They have been created in response to employers' perceptions that many learners are not achieving a sufficiently firm grounding in the basics.

There are sound reasons for choosing Edexcel if you want to be sure of giving your learners the best chance of success. Our papers are clear and well structured and, whether you are a teacher, a tutor, an employer or a training provider, you'll find that Edexcel offers the kind of practical support you need for seamless delivery.

You'll benefit from our experience

We've invested in the largest national functional skills pilot (250,000 entries from over 1,300 centres). You can rely on our experience and expertise to help you achieve the best results. We offer the full range of accredited functional skills qualifications for mathematics.

Clear, straightforward specifications for easier delivery

Each of our specifications has a simple structure and is easy to understand. Each will tell you clearly what you need to teach, making delivery that much easier. Turn to page 21 for guidance from our examiners on the key content of the specification.

A full range of support to meet your needs

We have worked closely with teachers, tutors and training providers over the course of our pilot to understand exactly what support they need. We've developed and tested teaching and learning resources, planning materials and assessment practice as well as a range of other support alongside the qualification. Turn to pages 18–20 to see the range of support available.

There's plenty of opportunity for assessment

We know that you'll want to fit functional skills around your other programmes of learning – that's why we're offering eight times throughout the teaching year when the tests can be taken. We know it's important to offer the flexibility to enter your students for assessment when they are ready. Sample papers can be found at **www.edexcel.com/fs** to help familiarise your learners with the assessment. You can also refer to our examiner guidance to the assessment from page 29 of this guide.

Clear, accessible papers for improved achievement

Lastly – and most importantly of all – our papers are clear, well written and highly accessible to all. Our aim is to give every learner the best chance of attaining a functional skills qualification.

Functional Skills Mathematics assessment at a glance

Functional Skills Mathematics, Levels 1 & 2, aims to ensure that each individual is able to solve problems in real-life, functional contexts and develop skills in:

- representing situations using mathematics
- analysing calculations and solving problems
- interpreting the mathematics to explain situations.

For each level, realistic contexts have been designed so that learners develop the functional skills they need. Candidates must pass the assessment at their chosen level in order to achieve the award for Functional Skills Mathematics. The qualification will be awarded as a pass or fail. There are unlimited re-sit opportunities for those who do not achieve the level required at the first attempt.

A summary of the assessment structure is shown in the table below:

Assessment structure – Levels 1 & 2

	Level 1	Level 2
Assessment	One external assessment. Eight assessment opportunities each year.	One external assessment. Eight assessment opportunities each year.
Sections	Three sections in each assessment. Each section has a theme.	Three sections in each assessment. Each section has a theme.
Assessment duration	1 hour 30 minutes.	1 hour 30 minutes.
Marks	16 marks per section. 48 marks in total.	16 marks per section. 48 marks in total.
Additional information	Calculators are allowed.	Calculators are allowed.

Teaching Functional Skills Mathematics within Key Stage 3 and GCSE

Teaching Functional Skills Mathematics within Key Stage 3

Functional Skills Mathematics, Levels 1 & 2, map to the KS3 Programme of Study.

Reasons for taking Functional Skills Mathematics at Key Stage 3 might include:

- providing a focus for learning essential skills, within a functional context
- securing essential skills as a foundation for success at GCSE
- introducing the skills and processes of examinations before GCSE work begins, along with experience of an external examination prior to GCSE
- the attainment of a recognised qualification in the core subject of mathematics, with points equivalent to half a GCSE.

The acquisition of functional skills at KS3 can also draw together some key skills across the whole curriculum, with themes that prepare learners for GCSE and also relate to Personal, Learning and Thinking skills (PLTS). These themes in mathematics are designed to create opportunities for learners to develop as self-managers, creative thinkers, reflective learners, problem-solvers, team workers, independent learners, and effective communicators. Many of these underpin the three elements that go together to define functionality: representing, analysing, interpreting. Please visit **www. edexcel. com/migrationdocuments/GCSE2010/Mathematics_Assessment_Guidance.pdf**, pages 1–12, for guidance and accompanying activities for embedding functional skills alongside PLTS in mathematics at KS3.

Teaching Functional Skills Mathematics within GCSE

Functional Skills Mathematics, Levels 1 & 2, map to the KS4 Programme of Study and to the 2010 GCSE specifications, where there is the option for learners to sit a separate Functional Skills Mathematics assessment. It gives you a real opportunity to prepare learners for the additional qualification within the same classroom at the same time, and for each learner to gain a nationally recognised qualification.

Edexcel Functional Skills Mathematics and GCSE

We've been using the extensive experience gained through our pilot to develop Functional Skills Mathematics alongside our new GCSEs in a way that is easy and straightforward to teach. The coverage and range of Functional Skills Mathematics, Levels 1 & 2, are delivered within both our linear and modular GCSE Mathematics specifications (see pages 6–15).

Further information on the synthesis between Functional Skills Mathematics, Levels 1 & 2, can be found at: **http://www.edexcel.com/quals/gcse/gcse10/synthesis**.

It's worth an additional half GCSE in SCAAT points

Functional Skills Mathematics, like its predecessors ALAN and Key Skills, is worth the equivalent of half a GCSE in SCAAT points. So whether you teach it within GCSE or as an additional curriculum offering, it gains valuable recognition for attainment within your school.

How Level 1 Functional Skills Mathematics maps within GCSE

Functional skills requirements are integrated within GCSE Mathematics. The tables that follow show the relationship between Functional Skills Mathematics, Levels 1 & 2, and Edexcel GCSE Mathematics.

Edexcel Functional Skills Mathematics Level 1		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
Understand and use whole numbers	• Understand place value • Write a number in words and in figures • Put whole numbers in order • Use of the terms odd, even, multiple, factor	**N a** Add, subtract, multiply and divide any number **N b** Order rational numbers **N c** Use concepts and vocabulary	1F 2F 3F 2F 2F	• Write numbers in words • Write numbers from words • Order integers • Recognise even and odd numbers • Identify factors, multiples
Understand negative numbers in practical contexts	• Recognise but not calculate, e.g. identify the warmest and coldest from a set of temperatures • Use temperatures	**N b** Order rational numbers	2F	• Order integers • Understand and use positive and negative integers, both as positions and translations on a number line
Add, subtract, multiply and divide whole numbers using a range of strategies	• Add, subtract, multiply and divide positive and negative whole numbers	**N a** Add, subtract, multiply and divide any number	1F 2F 3F	• Add, subtract, multiply and divide whole numbers • Derive and use positive integer complements to 100 • Recall all multiplication facts to 10 × 10, and use them to derive quickly the corresponding division facts • Multiply or divide any number by powers of 10
Understand and use equivalences between common fractions, decimals and percentages	• Understand equivalent fractions • Convert between fractions, decimals and percentages • Shade a fraction on a grid • Order common fractions	**N b** Order rational numbers **N h** Understand equivalent fractions, simplifying a fraction by cancelling all common factors **N j** Use decimal notation and recognise that each terminating decimal is a fraction **N l** Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions	2F 1F 2F 1F 2F 1F 2F	• Find equivalent fractions • Write a fraction in its simplest form • Convert between mixed numbers and improper fractions • Compare fractions • Understand place value • Identify the value of digits in decimals • Write terminating decimals as fractions • Recall the fraction-to-decimal conversion of familiar simple fractions • Convert between fractions and decimals and percentages • Order integers, decimals and fractions
Add and subtract decimals up to two decimal places	• Add decimals • Subtract decimals • Addition and subtraction with money	**N a** Add, subtract, multiply and divide any number **N j** Use decimal notation and recognise that each terminating decimal is a fraction	1F 2F 3F 1F 2F	• Add, subtract, multiply and divide decimals • Add and subtract mentally numbers with up to two decimal places • Understand place value • Identify the value of digits in decimals

Edexcel Functional Skills Mathematics Level 1		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	**Exemplification**	**Content descriptor**	**Spec B Unit**	**Concepts and skills**
Solve simple problems involving ratio, where one number is a multiple of the other	• Share an amount in a ratio (1:*n*) • Use ratios to find quantities, e.g. simple map scale, parts in a mixture • Simple proportion eg scaling up/down	**N p** Use ratio notation, including reduction to its simplest form and its various links to fraction notation **N t** Divide a quantity in a given ratio	1F 2F 1F 2F	• Use ratios • Write ratios in their simplest form • Divide a quantity in a given ratio • Solve a ratio problem in context
Use simple formulae expressed in words for one- or two-step operations	• Substitute numbers into a formula in words	**A f** Substitute numbers into a formula **N g** Understand and use number operations	2F 3F 1F 2F	• Use formulae from mathematics and other subjects expressed initially in words • Substitute numbers into a linear formula • Use brackets and the hierarchy of operations • Solve word problems

Solve problems requiring calculation, with common measures including money, time, length, weight, capacity and temperature	• Use addition, subtraction, multiplication and division in context	**GM o** Interpret scales on a range of measuring instruments	1F
			2F
				• Indicate given values on a scale
				• Interpret scales on a range of measuring instruments
				  – seconds, minutes, hours, days, weeks, months and years
				  – mm, cm, m, km, *ml*, *cl*, *l*, mg, g, kg, tonnes, °C
				• Use correct notation for time, 12- and 24-hour clock
				• Work out time intervals
				• Know that measurements using real numbers depend on the choice of unit

Convert units of measure in the same system	• Convert between metric measures (length, weight, capacity) • Convert between hours, minutes and seconds	**GM p** Convert measurements from one unit to another	2F 3F	• Convert between units of measure within one system • Convert metric units to metric units (Metric equivalents should be known)
Work out areas and perimeters in practical situations	• Find area and perimeter of rectangles and squares • Find areas and perimeters of compound shapes made from rectangles by counting squares	**GM x** Calculate perimeters and areas of shapes made from rectangles	2F	• Measure shapes to find perimeters and areas • Find the area and perimeter of a rectangle • Calculate area and perimeter of compound shapes
Construct geometric diagrams, models and shapes	• Measure angles in 2D shapes • Measure lengths • Draw 2D shapes using a ruler and protractor	**GM t** Measure and draw lines and angles **GM u** Draw 2D shapes using ruler and protractor	2F 3F	• Measure and draw lines to the nearest mm • Measure and draw angles to the nearest degree • Make accurate drawing of 2D shapes using a ruler and protractor • Make an accurate scale drawing from a diagram

How Level 1 Functional Skills Mathematics maps within GCSE

Edexcel Functional Skills Mathematics Level 1		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
Extract and **interpret** information from tables, diagrams, charts and graphs	Namely: • Tally charts • Pie charts • Pictograms • Bar charts • Line graphs • Conversion graphs • Mileage charts	**SP e Extract** data from printed tables and lists **SP i Interpret** a wide range of graphs and diagrams and draw conclusions	1F	• Extract data from lists and tables • From pictograms, bar charts, line graphs – read off frequency values – calculate total population – find greatest and least values • From simple pie charts – work out amounts for each category – calculate the total population – find greatest and least values • Recognise simple patterns, characteristics relationships in bar charts, line graphs. • Interpret – dual bar charts – pie charts – line graphs
Collect and **record** discrete data and **organise** and **represent** information in different ways	• Design a data collection sheet • Identify information from a table • Calculate with information from a table	**SP d** Design data-collection sheets, distinguishing between different types of data **SP g** Produce charts and diagrams for various data types	1F	Design and use data-collection sheets for grouped, discrete and continuous data • Collect data using various methods • Sort, classify and tabulate data and discrete or continuous quantitative data • Group discrete and continuous data into class intervals of equal width Produce: • Pictograms, bar charts, pie charts, dual bar charts • Frequency diagrams for grouped discrete data • Line graphs
Find mean and range	• Mean of discrete data • Range of discrete data	**SP h** Calculate, mean, range **SP l** Compare distributions and make inferences	1F	• Compare the mean and range of two distributions • Use dual bar charts to compare distributions
Use data to assess the likelihood	• Put events in order of likelihood on a probability scale • Justify decisions based on the probability scale • Explain results from the context of statistical diagrams and calculations	**SP m** Understand and use the vocabulary of probability and probability scale	1F	• Distinguish between events which are; impossible, unlikely, equal chance, likely, and certain to occur • Mark events and/or probabilities on a probability scale of 0 to 1

Functional elements in Edexcel GCSE Mathematics

GCSE Mathematics will assess functional elements of mathematics, as required by the Key Stage 4 Programme of Study for Mathematics. This will be 30–40% in Foundation Tier papers.

Grade descriptions: Grade F

- Candidates use some mathematical techniques, terminology, diagrams and symbols from the Foundation Tier consistently, appropriately and accurately.
- Candidates use some different representations effectively and can select information from them.
- They complete straightforward calculations competently with and without a calculator.
- They use simple fractions and percentages, simple formulae and some geometric properties, including symmetry.
- Candidates work mathematically in everyday and meaningful contexts.
- They make use of diagrams and symbols to communicate mathematical ideas.
- Sometimes, they check the accuracy and reasonableness of their results.
- Candidates test simple hypotheses and conjectures based on evidence.
- Candidates are able to use data to look for patterns and relationships.
- They state a generalisation arising from a set of results and identify counter-examples.
- They solve simple problems, some of which are non-routine.

Functional Skills Mathematics process skills

Edexcel Functional Skills qualification in Mathematics Level 1 assesses three interrelated process skills. The assessment weighting for each will be 30–40%:

Assessment weighting: 30–40%	Assessment weighting: 30–40%	Assessment weighting: 30–40%
Representing – selecting the mathematics and information to model a situation	**Analysing** – processing and using mathematics	**Interpreting** – interpreting and communicating the results of the analysis
• Candidates recognise that a situation has aspects that can be represented using mathematics. • Candidates make an initial model of a situation using suitable forms of representation. • Candidates decide on the methods, operations and tools, including ICT, to use in a situation. • Candidates select the mathematical information to use.	• Candidates use appropriate mathematical procedures. • Candidates examine patterns and relationships. • Candidates change values and assumptions or adjust relationships to see the effects on answers in models. • Candidates find results and solutions.	• Candidates interpret results and solutions. • Candidates draw conclusions in the light of situations. • Candidates consider the appropriateness and accuracy of results and conclusions. • Candidates choose appropriate language and forms of presentation to communicate results and solutions.

How Level 2 Functional Skills Mathematics maps within GCSE

Functional skills requirements are integrated within GCSE Mathematics. The tables that follow show the relationship between Functional Skills Mathematics Level 2 and Edexcel GCSE Mathematics.

Edexcel Functional Skills Mathematics Level 2		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
• Understand and use positive and negative numbers of any size in practical contexts	• E.g. Temperature changes • Put numbers in order • Addition and subtraction • Use the terms odd, even, multiple, factor	**N a** Add and subtract any number **N b** Order rational number **N c** Use concepts and vocabulary	1F 1H 2F 2H 3F 3H 2F 2H 2F 2H	• Add, subtract,(multiply and divide) whole numbers, negative numbers and integers • Order integers, decimals and fractions • Recognise even and odd numbers • Identify factors, multiples
• Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places	• Add, subtract, multiply and divide numbers up to two decimal places • Estimate answers to calculations • Includes negative numbers	**N a** Add, subtract, multiply and divide any number **N u** Approximate to specified or appropriate degrees of accuracy including a given power of ten, number of decimal places and significant figures	1F 1H 2F 2H 3F 3H 1F 1H 2F 2H	• Add, subtract, multiply and divide whole numbers and decimals • Add and subtract mentally numbers with up to two decimal places • Recall all multiplication facts to 10 × 10, and use them to derive quickly the corresponding division facts • Multiply and divide any number by powers of 10 • Solve a problem involving division by a decimal (up to two decimal places) • Round numbers to a given power of 10 • Round to the nearest integer and to a given number of significant figures or decimal places • Estimate answers to calculations, including use of rounding
• Understand, use and calculate ratio and proportion, including problems involving scale	• Write a ratio in its simplest form (*a:b*) • Scale quantities up or down • Calculations with ratios as one unit to another unit scale • Use map scales in diagrams • Simple direct and inverse proportion • Writing fractions as ratios	**N p** Use ratio notation, including reduction to its simplest form and its various links to fraction notation **N t** Divide a quantity in a given ratio **GM m** Use and interpret maps and scale drawings **N n** Direct and indirect proportion	1F 1H 2F 2H 1F 1H 2F 2H 3F 3H 3H	• Use ratios • Write ratios in their simplest (integer) form • Divide a quantity in a given ratio • Solve a ratio problem in context Use and interpret maps and scale drawings • Read and construct scale drawings • Draw lines and shapes to scale • Estimate lengths using a scale diagram • Calculate an unknown quantity from quantities that vary in direct or inverse proportion

How Level 2 Functional Skills Mathematics maps within GCSE

Edexcel Functional Skills Mathematics Level 2		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
• Understand and use equivalences between fractions, decimals and percentages	• Simplifying fractions • Finding fractions of a quantity • Improper and mixed numbers • Percentages of a quantity • Convert between fractions, decimals and percentages • Order fractions, decimals and percentages • Writing one number as a fraction of another	**N h** Understand equivalent fractions, simplifying a fraction by cancelling common factors **N j** Use decimal notation and recognise that each terminating decimal is a fraction **N l** Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions **N m** Use percentages **N o** Interpret fractions, decimals and percentages as operators	1F 1H 2F 2H 1F 1H 2F 2H 1F 1H 2F 1F 1H 3F 3H 1F 1H 2F 2H 3F 3H	• Find equivalent fractions • Write a fraction in its simplest form • Convert between mixed numbers and improper fractions • Compare fractions • Understand place value • Identify the value of digits in decimals • Order fractions, decimals and percentages • Convert between fractions, decimals and percentages • Calculate a fraction of a given quantity • Find a percentage of a quantity • Use decimals to find quantities • Use a multiplier to increase or decrease • Use percentage to solve problems
Understand and use simple formulae and equations involving one- or two-step operations	• Substitute numbers into a formula • Derive a formula in words • Changing the subject of a formula • Inverse operations • Formulae may include brackets	**A f** Derive a formula, substitute numbers in a formula and change the subject of a formula **N q** Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations **A d** Set up and solve simple equations	2F 3F 2H 3H 2F 3F 2H 3H 3F 3H	• Use formulae from mathematics and other subjects expressed initially in words and then using letters and symbols • Substitute numbers into a linear formula or simple formulae using indices • Use inverse operations • Set up simple equations • Rearrange simple equations • Solve simple equations • Derive a formula in words • Change the subject of a formula • Use brackets and the hierarchy of operations
Recognise and use 2D representations of 3D objects	• Sketch 3D solids • Nets • Plans, elevations • Draw 3D shapes on isometric grids	**GM k** Use 2-D representations of 3-D shapes	2F 3F 2H	• Use 2-D representations of 3-D shapes • Use isometric grids • Draw nets and show how they fold to make a 3-D solid • Understand and draw front and side elevations and plans of shapes made from simple solids • Given the front and side elevations and the plan of a solid, draw a sketch of the 3-D solid

How Level 2 Functional Skills Mathematics maps within GCSE

Edexcel Functional Skills Mathematics Level 2		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
Find area, perimeter and volume of common shapes	• Perimeter and area of triangles and rectangles • Circumference and areas of circles • Volume of cuboids and cylinders • Formulae will be given • Composite shapes may be used	**GM x** Calculate the perimeter and area of shapes made from triangles and rectangles **GM z** Find the circumference and area of a circle **GM aa** Calculate the volume of right prisms and shapes made from cubes and cuboids	2F 2H 3F 3H 2F 3F 2H 3H	• Find the perimeter of rectangles and/or triangles • Find the area of rectangles and/or triangles • Calculate perimeters of shapes made from triangles and rectangles • Calculate areas of shapes made from triangles and rectangles • Find the area of a shape on a grid • Calculate volumes of right prisms and shapes made from cubes and cuboids • Find circumferences of circles, and areas enclosed by circles • Find the volume of a cylinder • Use volume to solve problems • Find the volume of a cube and cuboid, and shapes made from cubes and cuboids.

Use, convert and calculate using metric and, where appropriate, imperial measures	• Including time, length, weight, capacity and temperature
	
	• Conversion graphs
	
	• Speed
	
	• Convert between metric units
	
	• Convert between imperial units
	
	• Convert between metric and imperial units
		GM p Convert measurements from one unit to another
		
		GM o Interpret scales on a range of measuring instruments
		
		GM s Understand and use compound measures
		
		A r Construct linear functions from real-life problems and plot their corresponding graphs
			1F 1H
			2F 2H
			3F 3H
			
			1F
			2F
			1H
			2H
			
			2F
			2H
			
			2F
			2H
				• Convert metric units to metric units (NB: Metric equivalents should be known)
				
				• Convert imperial units to imperial units (NB: Conversion between imperial units will be given)
				
				• Convert between metric and imperial measures
				
				• Know rough metric equivalents of pounds, feet, miles, pints and gallons:
				
				  Metric Imperial
				  1 kg = 2.2 pounds, 1 l = 1¾ pints ,
				  4.5 l = 1 gallon
				  8 km = 5 miles, 30 cm = 1 foot
				
				• Interpret scales on a range of measuring instruments
				
				• Use correct notation for time, 12- and 24-hour clock
				
				• Work out time intervals
				
				• Understand and use compound measures, including speed
				
				• Draw straight line graphs for real life graphs including conversion graphs, ready reckoner graphs

Collect and represent discrete and continuous data, using ICT where appropriate	• Collecting data • Tally charts • Frequency tables • Pie charts • Bar charts • Line graphs • Frequency tables • Grouped frequency tables • Scatter graphs	**SP a** Understand and use statistical problem-solving process/ handling data cycle **SP d** Design data-collection sheets distinguishing between different types of data **SP e** Extract data from printed tables and lists **SP g** Produce charts and diagrams for various data types	1F 1H 1F 1H 1F 1H 1F 1H	• Specify the problem and plan; formulate questions in terms of data needed, and consider what inferences can be drawn from the data • Interpret and discuss the data • Design and use data-collection sheets for grouped, discrete and continuous data • Sort, classify and tabulate data • Group discrete and continuous data into class intervals of equal width • Extract data from lists and tables • Produce: bar charts, pie charts, line graphs, scatter graphs and dual bar charts

Edexcel Functional Skills Mathematics Level 2		Link to Edexcel GCSE Mathematics Specification		
Coverage and range	Exemplification	Content descriptor	Spec B Unit	Concepts and skills
• Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate	• Mean, median, mode and range for discrete data • Modal class for grouped data • Positive and negative correlation and line of best fit	**SP h** Calculate median, mean, range, mode and modal class **SP i** Interpret a wide range of graphs and diagrams and draw conclusions **SP j** Look at data to find patterns and exceptions **SP k** Recognise correlation and draw and/ or use lines of best fit by eye, understanding what these represent **SP u** Use calculators efficiently and effectively, including statistical functions **A s** Discuss, plot and interpret graphs (which may be non-linear) modelling real situations	1F 1H 1F 1H 1F 1H 1F 1H 1F 1H 1F 1H 2F 2H 3F 3H	• Calculate mean, mode, median, range, modal class • Interpret: dual bar charts, pie charts and scatter graphs • From pictograms, bar charts, dual bar charts and line graphs read off frequency values, calculate total population and find greatest and least values • From pie charts, work out amounts for each category, calculate the total population and find greatest and least values • Recognise simple patterns, characteristics,relationships in bar charts, dual bar charts and line graphs • Draw lines of best fit by eye • Distinguish between positive, negative and zero correlation using lines of best fit • Understand that correlation does not imply causality • Calculate the mean of a small data set, using the appropriate key on a scientific calculator • Interpret line graphs for real-life situations – Ready-reckoner graphs, conversion graphs. fuel bills, e.g. gas and electric • Select an appropriate method to draw graphs from given data (which may give rise to curved lines) and interpret the results • Look at data to find patterns and exceptions
Use statistical methods to investigate situations	• Comparison of two groups using measure of average and range • Use line of best fit • Compare proportions in a pie chart	**SP l** Compare distributions and make inferences **SP k** Recognise correlation and draw and/or use lines of best fit by eye, understanding what these represent	1F 1H 1F 1H	• Compare the mean and range of two distributions • Understand that the frequency represented by corresponding sectors in two pie charts is dependent on the total populations represented by each of the pie charts • Use dual bar charts to compare distributions • Recognise the advantages and disadvantages between measures of average • Use a line of best fit to predict values of a variable given the values of another variable • Explain an isolated point on a scatter graph
Use probability to express the likelihood of an outcome	• Calculate theoretical probabilities • Compare probabilities • Put events in order of likelihood on a probability scale • Single events only • List outcomes of events	**SP m** Understand and use the vocabulary of probability and probability scale **SP n** Understand and use estimates or measures of probability from theoretical models (including equally likely outcomes), or from relative frequency **SP o** List all outcomes for single events (and for two successive events) in a systematic way and derive relative probabilities	1F 1H 1F 1H 1F 1H	• Distinguish between events which are: impossible, unlikely, equal chance, likely, and certain to occur • Mark events and/or probabilities on a probability scale of 0 to 1 • Write probabilities in words or fractions, decimals and percentages • Find the probability of an event happening using theoretical probability • Find the probability of an event happening using relative frequency • Estimate the number of times an event will occur, given the probability and the number of trials • List all outcomes for single events systematically • Use and draw sample space diagrams

Functional elements in GCSE Edexcel Mathematics

GCSE Mathematics will assess functional elements of mathematics, as required by the Key Stage 4 Programme of Study for Mathematics. This will be 20-30% in Higher Tier papers and 30-40% in Foundation Tier papers.

Grade descriptions: Grade C

- Candidates use a range of mathematical techniques, terminology, diagrams and symbols consistently, appropriately and accurately.
- Candidates are able to use different representations effectively and they recognise some equivalent representations e.g. numerical, graphical and algebraic representations of linear functions; percentages, fractions and decimals.
- Their numerical skills are sound and they use a calculator accurately.
- They apply ideas of proportionality to numerical problems and use geometric properties of angles, lines and shapes.

- Candidates identify relevant information, select appropriate representations and apply appropriate methods and knowledge.
- They are able to move from one representation to another, in order to make sense of a situation.
- Candidates use different methods of mathematical communication.
- Candidates tackle problems that bring aspects of mathematics together.
- They identify evidence that supports or refutes conjectures and hypotheses.
- They understand the limitations of evidence and sampling, and the difference between a mathematical argument and conclusions based on experimental evidence.
- They identify strategies to solve problems involving a limited number of variables.
- They communicate their chosen strategy, making changes as necessary.
- They construct a mathematical argument and identify inconsistencies in a given argument or exceptions to a generalisation.

Functional Skills Mathematics process skills

Edexcel Functional Skills qualification in Mathematics Level 2 assesses three interrelated process skills. The assessment weighting for each will be 30–40%:

Assessment weighting: 30–40%	Assessment weighting: 30–40%	Assessment weighting: 30–40%
Representing – selecting the mathematics and information to model a situation	**Analysing** – processing and using mathematics	**Interpreting** – interpreting and communicating the results of the analysis
• Candidates recognise that a situation has aspects that can be represented using mathematics. • Candidates make an initial model of a situation using suitable forms of representation. • Candidates decide on the methods, operations and tools, including ICT, to use in a situation. • Candidates select the mathematical information to use.	• Candidates use appropriate mathematical procedures. • Candidates examine patterns and relationships. • Candidates change values and assumptions or adjust relationships to see the effects on answers in models. • Candidates find results and solutions.	• Candidates interpret results and solutions. • Candidates draw conclusions in the light of situations. • Candidates consider the appropriateness and accuracy of results and conclusions. • Candidates choose appropriate language and forms of presentation to communicate results and solutions.

Teaching Functional Skills Mathematics within different pathways

Functional Skills Mathematics has become an important part of the school curriculum, with a number of pathways and options. Whatever route you decide to take, Edexcel can offer you support and guidance to ensure that your learners are engaged, motivated and able to achieve their best.

GCSE and Key Stage 3

Functional Skills Mathematics at Levels 1 and 2 maps to both KS3 and GCSE mathematics (see pages 5–15). If you elect to add Functional Skills Mathematics as a stand-alone qualification, your learners could earn points equivalent to an additional half a GCSE each.

BTEC

Our suite of exclusive qualifications provides opportunities for teaching and learning functional mathematics skills in a more vocational context. Research has shown that for many learners these vocational contexts are a successful platform for the applied teaching and learning of mathematics. These skills will be fully embedded in the specifications and support material for BTEC from September 2010. We have also sign-posted functional skills learning within our new BTEC specifications. This will boost the capabilities of learners working towards achieving a Foundation Learning programme of study.

Diploma

All candidates studying for the Diploma must achieve Functional Skills English, Mathematics and ICT to be awarded the full Diploma. Diplomas require learners to achieve functional skills at:

- Level 1 for the Diploma (Foundation) at Level 1
- Level 2 for the Diplomas (Higher and Advanced) at Levels 2 and 3.

Apprenticeship

All those enrolled on Apprenticeships will need to have or to achieve Functional Skills Mathematics to at least Level 1. Gaining Level 1 before leaving school will give them a head start.

Foundation Learning

This is a new framework for Entry and Level 1 qualifications. It can incorporate our exclusive-to-Edexcel vocational BTECs and stand-alone functional skills qualifications.

As a stand-alone qualification

Functional Skills Mathematics qualifications at Entry Level 1, 2, 3 and Levels 1 and 2 can be offered as stand-alone qualifications for Key Stage 3, 4 and post-16 learners. There are a number of reasons why Functional Skills Mathematics as a stand-alone could be an advantage both to your learners and to your centre.

- **Points:** A stand-alone Functional Skills Mathematics qualification at Level 2 is worth 23 points. This is equivalent to half a GCSE. The table below illustrates the performance points awarded by the DfE for Functional Skills Mathematics in addition to those awarded for any GCSE, Diploma or ALAN qualification.

Level:	Entry 1	Entry 2	Entry 3	Level 1	Level 2
Points:	5	5	7	12.5	23

- **Employer recognition for your learners:** Functional Skills Mathematics is becoming recognised by employers as evidence of the problem-solving and communication skills needed to perform effectively in the workplace.
- **Gateway to other qualifications:** Anyone who wants to go on to study for a Diploma or an Apprenticeship after passing their GCSE in Mathematics will need to sit the Functional Skills Mathematics qualification.
- **ALAN:** functional skills is set to replace ALAN and Key Skills, so you will need to be prepared for this change.

Published resources from Edexcel

Written by an experienced team including senior examiners, our resources build on learning from the pilot and are tailored to the new Edexcel Functional Skills Mathematics specification, so you know you are covering everything you need to.

	Level 1	Level 2
Student Books		
Teacher Guides		
ActiveTeach		

- **Comprehensive coverage** of the specification with a real focus on both process skills and practice.
- **Flexible resources** fit in with the way you want to teach – including KS3 and KS4 – and they come in an easy-to-use format, too.
- **Student Books** for both Level 1 and Level 2 come packed with sources and graphics to bring maths into the real world.
- **Teacher Guides** for both Level 1 and Level 2 contain resources including teaching notes, worksheets and practice assessment papers,

alongside information on teaching the course at KS3 and GCSE. They come with a CD-ROM containing additional resources as well as all the Teacher Guide material in digital format.

- **ActiveTeach CD-Roms** provide a wide range of resources and come enriched with BBC Active video clips that show maths in the real world and bring topics to life. Includes our ResultsPlus tool to check learners' maths skills and develop their problem solving ability. Audio of the Student Book questions help students to access the text.

Please visit **pearsonschools.co.uk/edexcelmathsfs** for further information.

Edexcel will also endorse resources from other publishers which meet the requirements of the specification. You will find details of other endorsed resources on our website as they become available.

Our own resources for Functional Skills Mathematics

Sample pages from the Student Books

Maths topic-based chapters build confidence with functional questions and link to other learning such as GCSE

Process skills made explicit: **R**epresenting, **A**nalysing, **I**nterpreting

Clearly stated objectives

3 Ratio and proportion

We're on the way

Have a go

1 Shelley plans a party for 60 children.

She wants to make a fruit punch out of orange juice and raspberry juice in the ratio 5:3.

She plans to make enough for each child to drink two glasses. Each glass contains roughly one fifth of a litre.

How many litre cartons of orange juice does she need to buy

2 Screen wash concentrate for cars is sold in 2-litre bottles.

The instructions state:

In winter months, mix 3 parts of the concentrate with 5 parts of water.

Samil's car has an empty screen wash container. The capacity of the container is 8 litres.

How many bottles of screen wash concentrate does Samil need to buy to fill the container in his car?

3 A youth worker plans to conduct a survey across three community groups. He decides to survey 30 people.

He wants to select people at random from each group. He also wants the number of members he surveys from each group to be in the same proportion as the group size.

Here is some information about the groups:

Ashford group	40 people
Bexhill Youth group	24 people
Baslow Road group	60 people

Advise the youth worker on how many people to survey from each group.

We're on the way

In this section you will:
- find proportional relationships in questions
- use ratios to scale quantities up or down
- calculate missing values in proportional relationships
- state any assumptions made in order to justify your answers

Take a look: Calories

Declan is on a diet and is counting calories.
Declan eats beef lasagne at a restaurant.
He does not know how many calories are in the lasagne.
He has a ready-made beef lasagne at home.

Here is some of the information on the box.
Individual serving 320 g
Contains 180 calories per 100 g

MICROChef BEEF LASAGNE

Declan assumes that the lasagne at the restaurant contains a third more calories per 100 g than the ready meal.
He estimates that he ate $1\frac{1}{2}$ times the weight of the ready meal.

Use the information to estimate how many calories the beef lasagne at the restaurant contained.

Here's a possible solution:

$\frac{4}{3} \times 180$ calories = 240 calories

'A third more' means $\frac{1}{3}$ times

Work out the estimated number of calories per 100 g in the restaurant lasagne

$1.5 \times 320 g = 480 g$

Work out the estimated weight of the restaurant lasagne

$480 g \div 100 \times 240$ calories = 1153 calories

Work out the estimated number of calories in the restaurant lasagne

The restaurant lasagne contains approximately 1150 calories.

Careful progression from less to more complex tasks, building to exam style questions

Colour bars indicate difficulty of questions

3 Ratio and proportion

Exam ready

Take a look: Missed appointments

The Randall Dental Practice is concerned about the number of missed appointments.

On 1 January 2010 they started to charge patients for missing their appointments.

The data they have gathered on the number of missed appointments is displayed in the bar charts below.

Number of missed appointments in 2009
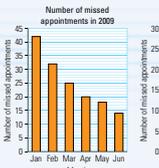
Number of missed appointments in 2010
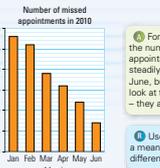
For both years the number of missed appointments declines steadily from January to June, but remember to look at the vertical scales – they are different!

Use proportions as a means of comparing different behaviour

Use the bar charts to describe the impact of the decision to start charging patients for missed appointments. Show all of your working.

Here's a possible solution:

	January	June
2009	42	14
2010	28	7

$\frac{14}{42} = \frac{1}{3}$ $\frac{7}{28} = \frac{1}{4}$

For both years, read off the values for January and June

Work out proportional relationships between the corresponding monthly values

The number of missed appointments in 2010 was consistently less than in 2009. The number of appointments missed in 2010 declined more sharply than in 2009 (a decrease of 75% in 2010 compared with 67% in 2009).

Interpret proportions to make conclusions and decide if you want to use fractions or percentages

Therefore, charging for missed appointments seems to have had a positive impact.

Have a go

1 Bhavna knows that when she drives long distances on the motorway she can drive for 400 miles on one full tank of petrol. When she drives short distances around town, she can drive for 200 miles on a full tank.

A full tank of petrol costs £80. This week she thinks that she will drive roughly 100 miles around town and 100 miles on the motorway.

Use this information to estimate how much her petrol will cost this week.

2 Mike wants to complete his Duke of Edinburgh Award. As part of the award he must lead a mountain walking team.

He has worked out that when he walks 70 strides, he covers 100 m of ground. A stride is two normal steps.

Mike is using a map with a scale of 1:25 000.

How many strides must he walk to cover a map length of 2.2 cm?

3 Mabel, her daughter Jane and her three-year-old grandson Tom may have a flu injection.

Mabel finds this chart on the Internet.

Influenza-like illness rate per 100 000 population in the UK by age band
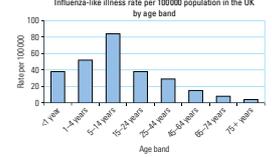
Jane and Mabel decide that if the risk of contracting flu is more than 1 in 5000 for any particular age bracket, then it is a good idea to be immunised.

Use the information in the chart to decide who is to be immunised.

Supportive worked examples

Support you can count on from Edexcel

We will give you access to a range of free practical and relevant resources to help you to deliver Functional Skills Mathematics easily. From lesson plans and schemes of work to practice papers and student exemplar material – you'll be fully equipped to get off to a flying start from September 2010.

Training events

We will be running a series of face-to-face and online training events to fully prepare you for delivering functional skills. For further information see **www.edexcel.com/fs**

Free Results*Plus* analysis service – to help you deliver ongoing improvement

Results*Plus* is the most comprehensive online results analysis service available and can be used to improve your students' performance. To view a demo of the service, please visit **www.edexcel.com/resultsplus**

Initial assessment

We're developing a tool to help you determine up front each individual learner's capability, so you can register your learners at the right level. Free of charge and only available from Edexcel, online initial assessment is planned for September 2010. Find out more at **www.edexcel.com/fs**

Expert people on hand – to ensure all your questions are answered quickly

Our free 'Ask the Expert' service for specific functional skills queries enables you to get your questions answered by one of our team of senior examiners, via our email service. Please visit **www.edexcel.com/asktheexpert** for further information.

Our National Managers and Regional Account Managers can provide you with face-to-face support and consultation. Visit **www.edexcel.com/regionaloffices** to find out who to contact.

For general enquiries, please call our customer services team on **0844 576 0026** or email **functionalskills@edexcel.com**

Subscribe to our free Functional Skills newsletters

To keep up-to-date with the latest developments, you can join our Functional Skills Development Group (commitment-free). We will periodically send you e-newsletters and other information you'll find useful. Please email **fsdevelopment@edexcel.com** to subscribe.

Mathematics Emporium

This is our mathematics forum, an email and website service. You can keep up-to-date with developments in mathematics, email in for expert advice or information, and receive electronic materials via **mathsemporium@edexcel.com**; for free access to past papers, mark schemes, grade boundaries and much more, go to **www.edexcelmaths.com**

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Specification

Functional Skills
Mathematics, Levels 1 & 2

Ofqual

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Rewarding Learning

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Structure of qualifications

Edexcel Functional Skills qualification in Mathematics at Level 1

Mathematics Level 1	Cash-in code: FSM01
• Externally assessed • Availability: please see the Edexcel website for details • First assessment: November 2010	**100% of the total qualification**
Overview of content • Representing using mathematics • Analysing situations mathematically • Interpreting solutions to problems using mathematics • Coverage of mathematical content in number, geometry and statistics	
Overview of assessment • Three themes in each assessment • Examination time will be 1 hour and 30 minutes • The total number of marks available is 48	

The Examiner explains

The assessment will be available eight times a year, giving flexibility to enter candidates when they are ready.

Support

Our published resources make the process skills explicit to help teaching and learning.

The Examiner explains

Each theme will include several questions set in a single context.

What's new

Each theme will have a total of 16 marks.

What's new

The examination time has been increased from 1 hour and 15 minutes.

Coverage and range

A learner should be able to:

- understand and use whole numbers and understand negative numbers in practical contexts
- add, subtract, multiply and divide whole numbers using a range of strategies
- understand and use equivalences between common fractions, decimals and percentages
- add and subtract decimals up to two decimal places
- solve simple problems involving ratio, where one number is a multiple of the other
- use simple formulae expressed in words for one- or two-step operations
- solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature
- convert units of measure in the same system
- work out areas and perimeters in practical situations
- construct geometric diagrams, models and shapes
- extract and interpret information from tables, diagrams, charts and graphs
- collect and record discrete data and organise and represent information in different ways
- find mean and range
- use data to assess the likelihood of an outcome.

The Examiner explains

For example: *identify the warmest and coldest from a set of temperatures.*

This includes negative numbers.

This includes sharing an amount in a ratio (1:*n*) and using ratios to find amounts, e.g. *parts in a mixture.*

Convert between metric measures (length, weight, capacity) and between hours, minutes and seconds.

Find the area and perimeter of rectangles and squares. Find the perimeter of compound shapes made up of rectangles by counting squares. Find the volume of cuboids by counting cubes.

This includes tally charts, pie charts, pictograms, bar charts, line graphs and conversion graphs.

Find mean and range of discrete data.

Support

Our published resources are structured by maths topic to build confidence and link to other learning.

Assessment structure at Level 1

Assessment	One external assessment.
Tasks	Three sections in each assessment.
	Each section has a theme.
Assessment duration	1 hour 30 minutes.
Marks	16 marks per section.
	48 marks in total.
Additional information	Calculators are allowed.
	All coverage and range will be assessed over one year.

Lessons from the pilot

Tasks will all have the same number of marks so candidates know what to expect.

Sampling of coverage and range

Coverage and range of the qualification will be sampled over one year of external assessment series.

Edexcel Functional Skills qualification in Mathematics at Level 2

Mathematics Level 2	Cash-in code: FSM02
• Externally assessed • Availability: please see the Edexcel website for details • First assessment: November 2010	**100% of the total qualification**
Overview of content	
• Representing using mathematics • Analysing situations mathematically • Interpreting solutions to problems using mathematics • Coverage of mathematical content in number, algebra, geometry and statistics	
Overview of assessment	
• Three themes in each assessment • Examination time will be 1 hour and 30 minutes • The total number of marks available is 48	

The Examiner explains

The assessment will be available eight times a year giving flexibility to enter candidates when they are ready.

Support

Our published resources make the process skills explicit to help teaching and learning.

The Examiner explains

Each theme will include several questions set in a single context.

What's new

The examination time has been increased from 1 hour and 15 minutes.

What's new

Each theme will have a total of 16 marks.

The Examiner explains

This includes working out estimates for calculations.

This can include deriving or changing the subject of a formula. Formulae may include brackets.

This includes rectangles, triangles and circles, and the volume of cuboids and cylinders. Composite shapes may also be used.

This includes conversion between metric and imperial.

This includes data collection, tally charts, frequency tables, pie charts, bar charts, line graphs, grouped frequency tables and scatter graphs.

This includes mean mode and median for discrete data; modal class for grouped data; positive and negative correlation, and line of best fit.

For example: *comparing two groups using statistical measures.*

Coverage and range

A learner should be able to:

- understand and use positive and negative numbers of any size in practical contexts
- carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
- understand, use and calculate ratio and proportion, including problems involving scale
- understand and use equivalences between fractions, decimals and percentages
- understand and use simple formulae and equations involving one or two operations
- recognise and use 2-D representations of 3-D objects
- find area, perimeter and volume of common shapes
- use, convert and calculate using metric and, where appropriate, imperial measures
- collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
- use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using information and communication technology (ICT) where appropriate
- use statistical methods to investigate situations
- use probability to assess the likelihood of an outcome.

Support

Our published resources are structured by maths topic to build confidence and link to other learning.

Assessment structure at Level 2

Assessment	One external assessment.
Tasks	Three sections in each assessment. Each section has a theme.
Assessment duration	1 hour 30 minutes.
Marks	16 marks per section. 48 marks in total.
Additional information	Calculators are allowed. All coverage and range will be assessed over one year.

Lessons from the pilot

Tasks will all have the same number of marks so candidates know what to expect.

Sampling of coverage and range

Coverage and range of the qualification will be sampled though external assessment series.

Write your name here

Surname		Other names

**Edexcel
Functional Skills**

Centre Number

Candidate Number

Mathematics
Level 1

Sample Assessment Material
Time: 1 hour 30 minutes

Paper Reference
FSM01/01

You must have:
Pen, calculator, HB pencil, eraser, ruler graduated in centimetres and millimetres, protractor, pair of compasses.

Total Marks

The Examiner explains

Candidates are expected to bring this equipment with them.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 48.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- **Where you see this sign you should show clearly how you get your answers as marks will be awarded for your working out.**

Advice

- Read each question carefully before you start to answer it.
- Show all stages in the calculations.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

The Examiner explains

Each paper opens with a clear familiar layout including:
- instructions candidates must follow
- information about the marks to show how much time to spend on each question
- supportive advice on technique.
All candidates should read this page carefully before they start.

Turn over ▶

Support

Our published resources provide plenty of practice of assessment style questions plus a complete practice paper with mark scheme.

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5

Edexcel Functional Skills Qualification in
Mathematics at Levels 1 and 2   Sample Assessment Materials   © Edexcel Limited 2010

SECTION A: Mid-shire Council

Answer all questions in this section.

Write your answers in the spaces provided.

1   Mid-shire Council is planning a charity meal.
     The meal will have a first course, a second course and a third course.
     People will choose what they want for each course.

First course: Soup **or** Salad.

Second course: Curry **or** Pasta Bake.

Third course: Cake **or** Ice cream.

The waiting staff need a data collection sheet to record the meal choices of each person.
A record of the meal choices is needed for each table.
There will be **5** people sitting at each table.

| Design a data collection sheet to record the meal choices for one table. | **(3)** |

Use the box below to show clearly your data collection sheet.

The Examiner explains

The Mark Schemes are provided in full in the accredited Sample Assessment Materials from Edexcel. To help you see how they work we have also printed them alongside the questions in this guide.

Question	Evidence	Mark	Notes
Q1	Interprets problem - two features	1 or	Two of: List of menu items, input opportunities (people or courses), headings.
	Three features	2 or	Three of: List of menu items, input opportunities (people or courses), headings.
	All four features	3	All of: List of menu items, input opportunities (people AND courses), headings. (NB: If data collection sheet includes orders for individuals, number of people needs to be correct.)
Total marks for this question		**3**	

(Total for Question 1 = 3 marks)

2 A man has complained to Mid-shire Council.
He thinks that his neighbour's hedge is too high.

If the hedge is too high, the council can order the neighbour to cut the hedge.

Hedge

House

4 m
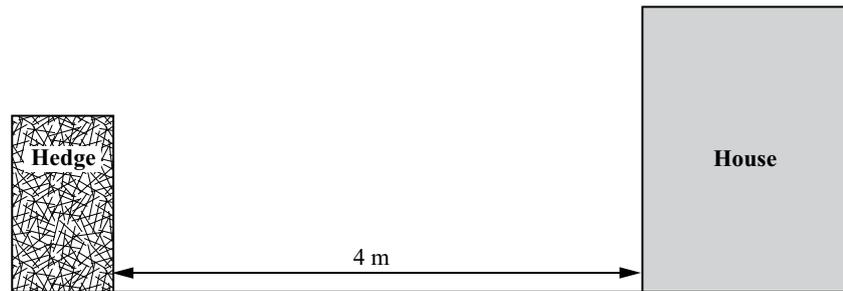
To find the height allowed for a hedge, the council uses the rule below.

| Distance (in metres) between the house and the hedge. | → | Divide by 2 | → | Add 1 metre |
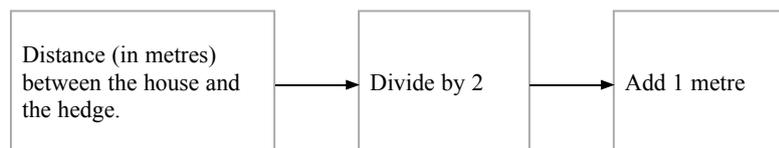
The distance between the house and the hedge is 4 m.

(a) What is the height allowed for the hedge? **(2)**

Use the box below to show your calculations.

Question	Evidence	Mark	Notes
Q2a	Distance between hedge and window	1 or	4 m is used
	Allowed hedge height	2	Correct allowed hedge height 3 m seen

The height of the hedge is 3.5 m.

(b) Should the council order the neighbour to cut the hedge? **(1)**

Use the box below to explain your answer.

Question	Evidence	Mark	Notes
Q2b	Action on hedge	1	The hedge should be lowered/cut or equivalent statement.

Examiner's teaching tip

This symbol indicates that there are marks available for working. Make sure your learners are aware that they must show their working whenever they see this symbol.

Lucy wants to plant a hedge in her garden.

She draws a plan of her garden on a centimetre squared grid.
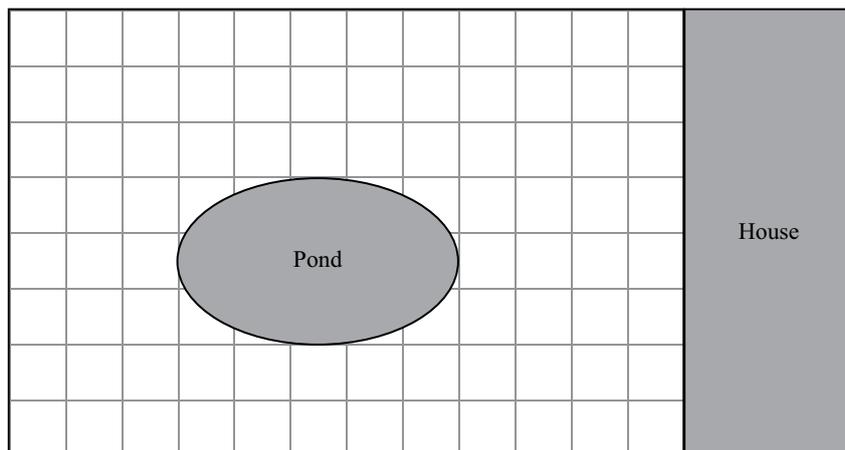
Key: 1 cm on the plan = 1 m in the garden

The hedge will be 1 m wide and 8 m long.
The hedge will be in the shape of a rectangle.
The hedge will run parallel to the house at the bottom of the garden.

(c) Show the hedge on Lucy's plan. **(2)**

Lucy wants to know the height allowed for her hedge.

(d) What is the height allowed for Lucy's hedge? **(2)**

Use the box below to show your calculations.

The Examiner explains

Ft means 'follow through', and indicates that there will be no penalty for correct use of a previous incorrect answer.

Question	Evidence	Mark	Notes
Q2c	Hedge sketch on plan	1 or	Two of: Correct length, correct width, correct position
		2	All three of: Correct length, correct width, correct position
Q2d	Calculation: ft from their (c)	1 or	Ft from their diagram "11" used in formula OR numerical method shown
		2	Ft from their diagram, appropriate method for height of hedge, 6.5 m
Total marks for question		**7**	

(Total for Question 2 = 7 marks)

3 Mid-shire Council spreads grit on the roads when the temperature is low.
The council want to predict how much grit they will need.

The table below shows the predicted number of days at different temperatures for next winter.

Temperature (°C)	Number of days
Above 0°C	44
0 to –5	4
–6 or below	19

Mid-shire Council spreads grit on the roads when the temperature is **0°C or less**.

(a) How many days will the council spread grit on the roads? **(1)**

Question	Evidence	Mark	Notes
Q3a	Interprets from table	1	23 is seen or implied

The council uses a mixture of salt and sand to make the grit.

The mixture is **1** part salt to **4** parts sand.

The council needs 250 tonnes of mixture each day when the temperature is low.

(b) How much salt and how much sand are used to make **250 tonnes** of this mixture? **(2)**

Use the box below to show your calculations and your answer.

Question	Evidence	Mark	Notes
Q3b	Finds ratio	1 or	$\frac{1}{5}$ or $\frac{4}{5}$ oe is seen or implied
	Applies ratio	2	$\frac{1}{5} \times 250$ or $\frac{4}{5} \times 250$ seen or implied (50, 200 seen)

The Examiner explains

oe means 'or equivalent'. Marks will be given for correct answers in equivalent fractions, decimals or percentages.

The council needs 250 tonnes of mixture for **each day** that grit is spread on the roads.

The council must estimate the cost of the grit needed for next winter.

Salt costs £71.95 per tonne.

Sand costs £12.21 per tonne.

(c)   Calculate an estimate for the cost of grit needed for next winter for Mid-shire Council.

(3)

Use the box below to show how you get your answer.

Examiner's teaching tip

Candidates should know the difference between estimating and calculating an estimate. Many will answer this question with an 'educated guess'. The word 'estimate' is used here because the number of days is predicted rather than known. Candidates must do a calculation to get the marks for this question, but note that rounding of the figures for costs is accepted because of the wording (see mark scheme).

Question	Evidence	Mark	Notes
Q3c	Finds total tonnes	1 or	'50' × 23 or '200' × 23 seen or implied. Ft from their (a) and (b)
	Applies price to their answers	2 or	71.95 × '50' × 23 or 12.21 × '200' × 23 **OR**
	Price and total processes can be in either order		72 × '50' × 23 and 12 × '200' × 23 Ft from their (a) and (b) Accept rounded answers for 71.95 and 12.21
	Decision	3	£138000 or better (£138908.50) **OR** accept £140 000 or better Ft from their (a) and (b)
Total marks for question		**6**	

(Total for Question 3 = 6 marks)

SECTION B: Jobs

Answer all questions in this section.

Write your answers in the spaces provided.

4   Barry interviews people for jobs.

He can interview up to **10** people each day.

A computer company wants Barry to interview **62** people.

(a) What is the least number of days that Barry will need for these interviews?   **(2)**

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q4a	Attempts to find out how many days are needed	1 or	62 ÷ 10 or any method, eg how many lots of 10 in 62, 6 days only, 6.
	Considers rounding	2	7 days

Examiner's teaching tip

This is a situation where the context dictates the rounding. Although the answer is 6.2 days, it must be rounded up to 7 to gain full marks.

(b) Show how you can **check** your answer in the box below.   **(1)**

Examiner's teaching tip

An appropriate reverse calculation is expected here.

Question	Evidence	Mark	Notes
Q4b		1	Appropriate reverse calculation oe
	Total marks for question	3	

(Total for Question 4 = 3 marks)

5   Barry has been asked to compare the pay for two jobs.

Able Computer Sales	Beta IT Support
Marketing Manager	**Sales Assistant**
Pay: £25 000 per **year**	Pay: £1750 per **month** + bonus of 20% of monthly pay

Which job pays more?   **(4)**

Examiner's teaching tip

Working is essential in this type of question requiring a decision. Candidates must show working with their answer to gain any marks.

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q5	Attempts salary in same time period	1 or	Attempts to put both in same time period, both in yearly or monthly period (accept weekly if consistent use of weeks in year or weeks in month) 1750 × 12 OR 24000 ÷ 12 seen or implied
	Includes bonus	2 or	Applies bonus, "21000" ×1.2 oe seen, or 1750 ×1.2
	States salary in same time period	3	Final amounts seen, 24000, 25200 **OR** 2000, 2100
	Includes, salary in same time period And B oe	1	Decision correct for their working, company or role stated
Total marks for question		**4**	

(Total for Question 5 = 4 marks)

6 Barry helps people plan which days they work.
He helps Jeba plan her work for three weeks.

Jeba works for two companies, Compulike (C) and Easytype (E).

Jeba is paid £550 for **four** days work at Compulike.

She is paid £110 for **each** day of work at Easytype.

(a) Which company pays Jeba more for her time? **(1)**

Use the box below to explain your answer.

Question	Evidence	Mark	Notes
Q6 (a)	Explanation	1	Compares pay in the same time period, eg 1 day or multiple of 4 days

Barry has a choice of two plans for Jeba. The plans are shown below.

Plan 1

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1		C	E	C	E
Week 2			C	E	
Week 3	C			E	

Plan 2

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1		E		C	E
Week 2	C		C	E	E
Week 3		C	E		

Jeba wants to earn as much money as she can.

(b) Which plan should Jeba choose? Explain your choice.
Calculate her total pay for this plan.

(3)

Use the box below to show your answer and calculations.

Question	Evidence	Mark	Notes
Q6 (b)	Interprets symbolism	1 or	Indication that number of days for each company found, **OR** total for each week seen or implied
	Incorporates pay Decision	2 or 3	500 + ("5" × 110) seen or implied States plan following from their working
	Total marks for question	4	

(Total for Question 6 = 4 marks)

7 Maria is interviewed for a job. She hands in this claim form.

Claim form
Complete all totals.

Reason for claim:	Details:	Total:
Train fare:	**Return ticket**	£ 121.50
Car travel:	30 miles at 27p per mile	£ ....
Travel refreshments:	£4.80 £3.40	£ ....
	Total claim £	

(a) Complete the claim form for Maria.   **(3)**

Use the box below to show any calculations.

Question	Evidence	Mark	Notes
Q7a	Completes table Partial calculation seen or implied	1 or	30 × 27 seen or implied or 8.10 in table (or 137.80) or 8.20
		2 or	8.10 and 8.20 seen in table or ft correct table with .7 error or 137.80
		3	All of 8.10, 8.20, and 137.80 seen in table

This claim form is out of date.

Car travel is now 29p per mile.

(b) How much **extra** should Maria claim for car travel?   (2)

Use the box below to show how you get your answer.

Question	Evidence	Mark	Notes
Q7b	Considers adjustments Complete method shown	1 or	$30(29 - 27)$ or 30×29 then recalculation
	States answer	2	Eg: £0.60 (60p) correct money units.
Total marks for question		**5**	

(Total for Question 7 = 5 marks)

SECTION C: Jan

Answer all questions in this section.

Write your answers in the spaces provided.

8 A theme park has shows and rides.

The table below gives the start time and the length of show for four shows.

show	start times (pm)				length of show (mins)
High Summer		1.15	3.00		45
Timmy Boo	12.00		2.45	4.15	20
The Sea Lion Show	12.15	1.30	3.00	4.40	35
Warrior Show		1.30	3.00		35

Jan wants to take her nephew to see all four shows.

She wants to see each show from start to finish.
She wants to leave the theme park by 5pm.

Show how Jan and her nephew can see all four shows.   **(4)**

Use the box below to show your answer.

> **The Examiner explains**
>
> When displaying information candidates need to start by putting in a table, and deciding what will go in the rows and columns.

Question	Evidence	Mark	Notes
Q8	A schedule of shows	1	At least two shows with no time clashes
	Start times are not sufficient on their own to identify shows	1 or	At least two shows, with times, and exit from shows before 5pm
		2 or	At least three shows, with times, and exit from shows before 5pm
		3	All four shows (no more), with times, and exit from shows before 5pm and no clashes Example: SL: 12.15 – 12.50 W 1.30 – 2.05 H 3 – 3.45 T 4.15 – 4.35
Total marks for question		**4**	

(Total for Question 8 = 4 marks)

9 Jan wants to choose a digital TV package.
   Jan's three options are shown below.

Package	One-off joining fee	Monthly cost
1	£30.00	£24.99
2	£15.00	£15.00 per month for the first 3 months then £29.35 each month
3	None	£36.00

Compare the cost of the three TV packages for one year.
Which package is best for Jan?

(5)

Use the box below to show your calculations and comparisons.

The Examiner explains

Candidates need to show which package is best for Jan, as well as making a clear statement about which one is best. Showing working is essential.

Question	Evidence	Mark	Notes
Q9	Finds correct total per year for one package or approximates	1 or	One of 329.88, 324.51, 432 **OR** Appropriate approximation for two values
	Accept comparison in months if adjustments for one-off payments and P2 made		P1: 30 + (12 × 24.99) **OR** Approximation method: 30 + 25 × 12 = (330) P2: 15 + (15.12 × 3) + (29.35 × 9) **OR** Approximation method: 15 + (15 × 3) + (30 × 9) = 330 P3: 36 × 12 = (432)
	Finds correct total per year for two packages or approximates	2 or	Two of 329.88, 324.51, 432 **OR** Appropriate approximation for all three values
	Totals per year for all packages	3	All Three: 329.88, 324.51, 432
	Compares two packages	1 or	One comparison made. Incorrect figures allowed.
	P2: Cheapest implies comparison	2	Comparisons made across all three options (correct figures) **OR** approximations with appropriate justifications for within package is cheapest.
Total marks for question		**5**	

(Total for Question 9 = 5 marks)

10 Jan wants to reduce her water bill.
She fills in this chart for **one week**.

	Tally
shower	~~IIII~~ I
toilet	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II
washing machine	IIII

Key: ~~IIII~~ = 5

Jan finds the following information on a website.

	Litres used
shower (per shower)	30
toilet flush (per flush)	10
washing machine (per use)	100

Jan uses 40 litres of water **per day** for other things, such as cooking, washing up, drinking, and cleaning her teeth.

(a) How much water does Jan use in **one week**? **(3)**

Use the box below to show how you get your answer.

The Examiner explains

Key information is shown in bold. Here the difference between days and weeks should be noticed.

Question	Evidence	Mark	Notes
Q10a	Interprets tally	1 or	37 or 6 seen or implied.
	Two features used	2 or	370 or 160 or 180 or 400 or 150 seen or implied
	Accounts for all uses	3	950 + 280 =1230 weekly

Jan wants to know if her water bill would be cheaper if she had a water meter.
She assumes she uses the same amount of water each week.
Jan finds out some information about water charges.

With water meter: Fixed charge per year £22
                     plus £1.10 for every 1000 litres of water used.

Without water meter: Fixed charge of £120 per year

(b) Would Jan's water bill be cheaper if she had a water meter?   (4)

Use the space below to show how you get your answer.

Question	Evidence	Mark	Notes
Q10b	Yearly water consumption Their 1230 × [48,52] [59040, 63960]	1	Allow weeks in year from range 48 to 52 Ft from their (a)
	Per 1000 litres Their yearly is allowed	2	Per 1000 litres consumption figure
	Metered water cost 22 + 1.10× [59.04, 63.96]	1 or	Must be a money answer [£86.94, £92.3]
	Decision made	2	A comparison is made or implied. A decision is made.
Total marks for question		**7**	

(Total for Question 10 = 7 marks)

TOTAL FOR PAPER = 48 MARKS

The Examiner explains

Candidates can be awarded marks here following through from their own answer to (a); errors made in (a) are not penalised again here.

Write your name here

Surname		Other names

Edexcel
Functional Skills

Centre Number Candidate Number

Mathematics
Level 2

Sample Assessment Material
Time: 1 hour 30 minutes

Paper Reference
FSM02/01

You must have:
Pen, calculator, HB pencil, eraser, ruler graduated in centimetres and millimetres, protractor, pair of compasses.

Total Marks

The Examiner explains

Candidates are expected to bring this equipment with them.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators may be used.**

Information

- The total mark for this paper is 48.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- **Where you see this sign you should show clearly how you get your answers as marks will be awarded for your working out.**

Advice

- Read each question carefully before you start to answer it.
- Show all stages in the calculations.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

The Examiner explains

Each paper opens with a clear familiar layout including:
- instructions candidates must follow
- information about the marks to show how much time to spend on each question
- supportive advice on technique.
All candidates should read this page carefully before they start.

Turn over ▶

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Our published resources provide plenty of practice of assessment style questions plus a complete practice paper with mark scheme.

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Section A: Jobs

Answer all questions in this section.

Write your answers in the spaces provided.

1 Barry interviews people for jobs.
   Each person he interviews gives him a claim form.
   One person gave him the claim form below.

   Barry checked the claim form and found some errors.
   He put a ring round all the errors on the form.

Claim form		
Complete all sections.		
Reason for claim	**Details**	**Total**
Train fare	**Return ticket**	£ 122.50
Car travel	28 miles at 27p per mile	£ 8.16
Travel refreshments	£4.80 £3.40	£ 7.20
	Total claim	£ 137.36

The cost of car travel is now **29p** per mile.

What should the correct **Total claim** be?   (4)

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q1	Identifies correct calculations	1 or	28×29 or $4.80 + 3.40$ seen
		2	8.12, 8.20 seen
	Complete method shown	1 or	Attempt to find correct total: "8.12" + "8.20" + 122.50
	States answer	2	138.82
Total marks for question		**4**	

(Total for Question 1 = 4 marks)

2 Barry has to organise interviews on one day.

5 people are going to be interviewed for a job.
The 5 people are Ali, Ben, Charlie, Dan and Erica.

Each person will have **3** separate interviews.
Each person will be interviewed once in each of 3 rooms.

Anyone **not** being interviewed will wait in the waiting room.

- Each interview will last **15** minutes.

- There are **5** minutes between each interview.

- The first interviews will start at **9.00 am**.

- All rooms can be used for interviews at the same time.

Room 1	Room 2	Room 3	Waiting room

Draw a chart or table to show the times and rooms for the 5 people being interviewed.

(4)

Use the box below to show your answer clearly.

Question	Evidence	Mark	Notes
Q2	Considers criteria for at least one person Assume 5 min if intervals are 20 min	1 or	Two of : 9.00 am start: (15 min interval: 5min between each interview):No overlap in rooms
	Intervals: need to see at least 5 consecutive times	2	All of : 9.00 am start: (15 min interval: 5 min between each interview) No overlap in rooms.
	Considers presentation Coordinates two of: time, people, rooms.	1 or	All times given for at least three people or rooms
	Coordinates features time, people, rooms	2	Times and rooms given for all people or people and rooms (correct)
Total marks for question		**4**	

(Total for Question 2 = 4 marks)

3 Barry has been asked to compare the pay for four similar jobs advertised in a news paper.

Able Computer Sales	Beta IT Support
Sales Consultant	***Sales Assistant***
Pay: £23,000 per year	Full time: 30 hours per week Pay: £15 per hour
Compu Systems	Digital Hardware
Sales Agent	***Sales Adviser***
Pay per month will be £1800, plus commission of 1% of monthly sales. Average monthly sales are £22,000.	Salary of £20,000 per year + team bonus of 20% of salary.

Examiner's teaching tip

Working is essential in this type of question requiring a decision. Candidates must show working with their answer to gain any marks.

(a) How much does Beta IT Support pay per year? **(2)**

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q3a	Attempt to convert B	1 or	30 × 15 seen or implied
	Correct conversion using 52 weeks OR 48 weeks	2	21600 OR 23400 seen

(b) Which job pays the most money? **(6)**

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q3b	C and D salary calcs Monthly or yearly or weekly acceptable Accept use of 52 or 48 weeks in a year, if consistently used Accept use of 4 weeks in a month, if consistently used	1 or	Correct method to convert C **OR** D for comparison: C yearly: $1800 + (0.01(\text{oe}) \times 22000)$ $(1800 + \text{"220"}) \times 12$ (oe) C monthly $1800 + (0.01(\text{oe}) \times 22000)$ C weekly (assumes 4 weeks in a month) $1800 \div 4 + (22000 \times 0.01(\text{oe})) \div 4$ C weekly (conversion from year) $1800 + (0.01(\text{oe}) \times 22000)$ $(1800 + \text{"220"}) \times 12$ (oe) $\div 52$ **OR** D yearly: 20000×1.2 (oe) D monthly: 20000×1.2 (oe) $\div 12$ D weekly 20000×1.2 (oe) $\div 52$ OR 20000×1.2 (oe) $\div 48$
		2 or	Correct method to convert C **AND** D for comparison
	£24240/ 24000 per year £2020/£2000 per month £505/£466.15/ per week (52 wks) £461.54/£500 per week (48 wks)	3 or	Correct answer for C OR D Time periods can be different but accuracy required
	£24240/ 24000 per year £2020/£2000 per month £505/£466.15/ per week (52 wks) £461.54/£500 per week (48 wks)	4	Correct answer for C AND D Time periods can be different but accuracy required
	Comparison of all in same time period	1 or	A, B, C, D in same time period in order to compare
	Decision (D)	2	Correct decision (ft) from their working and their (a). Compares jobs in the same time period. Decision stated clearly comparing jobs in same time period.
Total marks for question		**8**	

(Total for Question 3 = 8 marks)

Section B: Mid-Shire Council

Answer all questions in this section.

Write your answers in the spaces provided.

4 A man has complained to Mid-shire Council.
He says that a neighbour's hedge is causing loss of light to his garden.

When the hedge is too high, the council can order the neighbour to cut the hedge.
The council uses this formula to work out the height allowed for a hedge.

$$H = DA \div L$$

H = The height of hedge allowed (m)
D = Direction factor
A = The area of the garden affected by the hedge (m^2)
L = The length of the hedge (m)

The direction factor of the man's garden is 0.55
The area of the man's garden affected by the hedge is 40.5 m^2.
The length of the hedge is 9 m.

The height of the hedge is **3 m**.

Should the council order the neighbour to cut the hedge? **(3)**

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q4	Uses figures correct substitution	1 or	$0.55 \times 40.5 \div 9$
		2	2.475
	Makes decision	1	Makes a correct decision based on the information presented.
Total marks for question		**3**	

(Total for Question 4 = 3 marks)

5 Mid-shire Council runs a service which delivers meals to elderly people.

The council uses five vans to deliver meals.

The vans are the same make and model.

The table below gives information about the value and ages of the five vans.

New	1 year old	2 years old	3 years old	4 years old	5 years old
£16 000	£ 11 500	£9800	£8500	£7400	£6500

The council want to be able to estimate the value of a van using its age.

(a) Draw a graph the council could use to estimate the value of a van. **(3)**

Examiner's teaching tip

Remind your learners to label the axes.
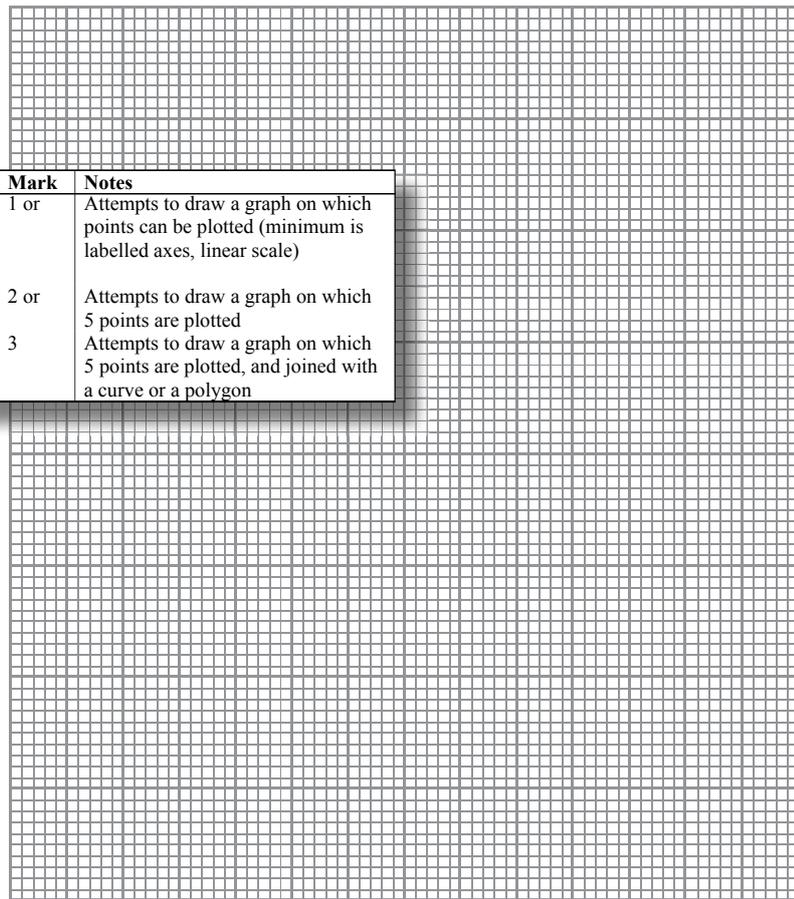
Question	Evidence	Mark	Notes
Q5a	Appropriate graph would be scatter or line graph Accept bar graph	1 or	Attempts to draw a graph on which points can be plotted (minimum is labelled axes, linear scale)
		2 or	Attempts to draw a graph on which 5 points are plotted
	Tolerance of 2 mm when plotting	3	Attempts to draw a graph on which 5 points are plotted, and joined with a curve or a polygon

The council wants to buy another van of the same make and model to deliver meals.

One van is 2.5 years old.

(b) How much should the council expect to pay for the van? (2)

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q5b	Selects method to use	1 or	Reads from their graph or uses table using linear midpoint
	Interprets information	2	Arrives at an appropriate estimate: ft from their graph if not. Answer in the range 8900 - 9200
	Total marks for question	**5**	

The Examiner explains

Candidates can use more than one method to work out their answer. Any appropriate method will be credited.

(Total for Question 5 = 5 marks)

6 The table below shows information about the grit mixture Mid-shire Council used on icy roads last year.

> **Last year's mixture**
>
> Grit mixture: salt to sand in the ratio of 1:2 by weight.
>
> The council used **300** tonnes of this grit mixture **each day** when the roads were icy.
>
> The costs of materials: Salt: £71.95 per tonne.
> Sand: £12.21 per tonne.

(a) What is the cost of last year's mixture for each day it was used? **(2)**

Use the box below to show clearly how you get your answer.

The Examiner explains

This is a short question where just the answer will gain 2 marks.

Question	Evidence	Mark	Notes
Q6a	Attempts to find either amount currently	1 or 2	300 ÷ 3 × 71.95 OR 300÷ 3 × 2× 12.21 seen or implied OR 71.95 + 12.21 + 12.21 × 100 oe £9367 seen or implied

Jenny has to reduce the cost of grit mixture for the council.
She recommends changing to the following mixture.

Jenny's mixture

Grit mixture has a salt content of 25% by weight.

The council will still use 300 tonnes of this grit mixture **each day** the roads are icy.
The cost of materials has **not** changed.

It is predicted that there will be **29** days in 2010/11 when the roads are icy.
Jenny compares the cost of her plan with last year's plan for 29 days.

Jenny says her plan will cost less than last year's plan.

(b) What is the difference in cost for the council if they use Jenny's mixture for 2010/11?

(6)

Use the box below to show clearly how you get your answer.

The Examiner explains

This is a longer question, with the marks divided into sections. The award of marks therefore depends on clear working being shown.

Question	Evidence	Mark	Notes
Q6b	Attempts to find new cost per day OR find amount of salt in comparison to sand	1 or	(300) ÷ 4 × 71.95 OR (300) ÷ 4 × 3 × 12.21 seen or implied OR 71.95 + 3 × 12.21 × 75 oe
		2	Correct cost of either salt OR sand seen for 1 day 5396.25, 2747.25
		3	Correct cost of either salt AND sand seen for 1 day or total cost for 1 day (8143.5, 5396.25, 2747.25
	Attempts to find cost for 29 days	1 or	Their (a) × 29 OR '8143.5'× 29 seen or implied OR Difference between daily rate found (1223.5)
	Cost for 29 days	2 or	Their (a) × 29 AND '8143.5'× 29 seen or implied OR their Difference between daily rate × 29 seen or implied
	Correct total found	3	Correct difference found 35481.50
Total marks for question		**8**	

(Total for Question 6 = 8 marks)

Section C: Garden

Answer all questions in this section.

Write your answers in the spaces provided.

7 Jeba grows plants.
She uses liquid plant food.

> **Concentrated Liquid Plant Food**
>
> Bottle contains: 1500 ml plant food
>
> *Instructions to feed each plant:*
> Mix 15 ml of plant food with 1 litre of water

Jeba uses 15 ml of plant food with 1 litre of water to feed **1** plant.

She has 9 plants growing in the greenhouse.
The plants in the greenhouse need feeding with plant food **once a week**.

She has 11 plants growing in the vegetable plot.
The plants in the vegetable plot need feeding with plant food **twice a week**.

> How many bottles of plant food does Jeba use in 12 weeks?   (4)

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q7	Number of feeds in 1 bottle	1	1500 ÷ 15 oe, 100 feeds per bottle seen, seen or implied
	Number of feeds per set of plants	1 or	12 × 9 OR 12 × 11 × 2 seen or implied OR 9 + (11 × 2) seen or implied OR their total feeds per week × 12
		2 or	12 × 9 AND 12 × 11 × 2 seen or implied OR 9 + (11 × 2) × 12 OR 372 seen
	Total number of bottles	1	4 bottles stated or ft from their total number of feeds ÷ 100
	Total marks for question	**4**	

(Total for Question 7 = 4 marks)

8 Jeba uses food waste to make compost.

Her compost bin is in the shape of a cuboid.
The compost bin has length 65 cm, width 64 cm
and height 120 cm.
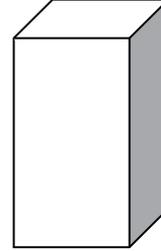
Diagram **NOT** accurately drawn

Volume of a cuboid = length × width × height

Jeba fills the compost bin completely with food waste.

The food waste becomes compost and reduces in volume by 40%.

(a) What is the volume of the compost **after** it has been reduced by 40%? **(3)**

Use the box below to show clearly how you get your answer.

Question	Evidence	Mark	Notes
Q8a	Attempt to find volume	1 or	65 × 64 × 120 seen or implied
	Attempt to reduce volume	2 or	"65 × 64 × 120" × 0.4 (oe)
	Correct reduced volume + unit	3	Answer 199680 cm^2 or 19.968 m^2

Examiner's teaching tip

Estimation or reverse calculation methods are acceptable here.

(b) Show how you can check your answer to (a). Write your check in the box below. **(2)**

Question	Evidence	Mark	Notes
Q8b	Checking procedure selected	1 or	Attempt to estimate OR attempt to reverse calculation or appropriate other method
		2	Correct estimation OR reverse calculation or appropriate other method

Jeba can cover 0.25 m^2 of the vegetable plot with 1 litre of compost.

The vegetable plot is a rectangle which measures 11 m by 7 m.

> 1 litre = 1000 cm^3
>
> 1000 litres = 1m^3

(c) Can Jeba cover all of the vegetable plot with compost from **one** compost bin?　　(4)

Use the box below to show clearly how you get your answer.

Examiner's teaching tip

Conversion between units is a general weakness, with candidates confusing x100 and x1000.

Question	Evidence	Mark	Notes
Q8c	Area of plot	1	11 × 7 seen or implied
	Ft from their (a) throughout	1 or	Their (a) converted to litres 199680 ÷ 1000 (cm) or 0.19968 × 1000 seen or implied
	Finds number of litres of compost		
	Finds number of litres needed for plot	2 or	"77" ÷ 0.25 (oe) or "77" × 4
	Correct decision	3	Correct decision supported by their working
Total marks for question		**9**	

(Total for Question 8 = 9 marks)

9 Jeba wants to grow potatoes.

(Source: www.gardening-tools-direct.co.uk)

Here is some information Jeba finds out about potatoes.

Type of potato	Sowing distances	Total weight of potatoes from each plant in one year
King Edward	• sow 20 cm deep • 37.5 cm between each seed potato in a row • rows 75 cm apart	5 kg

Jeba will plant potatoes in a rectangular plot 6 m wide by 10 m long.
She will use all of the plot for growing potatoes.

Jeba will grow potatoes to sell.
She wants to know the weight of potatoes she can grow in one year.

> What weight of potatoes can Jeba grow in one year? **(3)**

Use the box below to show clearly how you get your answer.

You can use this grid to help you work out your answer.

Question	Evidence	Mark	Notes
Q9	Answer may be shown diagrammatically or use calculations Number of plants attempted May leave gap at ends of plot Allow gap between 30 – 50 cm Allow rows to run along 6 m side or 10 m side of plot	1 or	Finds number of plants in row **OR** number of rows **(No gap, along 6 m side)** 600÷ 37.5, 16 seen or implied (oe) 1000 ÷ 75, 13 seen or implied (oe) **(Gap, along 6 m side)** **"600"** ÷ 37.5,seen or implied (oe). Allow answers [13, 15] "1000" ÷ 75, seen or implied (oe). Allow answers [12, 13] **(No gap, along 10 m side)** 1000÷ 37.5, 26 seen or implied (oe) 600 ÷ 75, 8 seen or implied (oe) **Gap, along 10 m side)** "1000" ÷ 37.5, seen or implied (oe). Allow answers [24, 25] 600 ÷ 75, seen or implied (oe) Allow answers [5, 6]
	Ft from their method	2 or	Their plants in a row × number of rows (ft from 1st mark) Allow answers [120- 208] OR Uses area method 700 × 1000÷ (37.5 × 75),
	Ft from their method	3	Their number of plants × 5
Total marks for question		**3**	

(Total for Question 9 = 3 marks)

TOTAL FOR PAPER = 48 MARKS

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