**Pearson Functional Skills Mathematics Entry Level 3**

**Scheme of Work overview**

**Subject content Level GLH**

**Using numbers and the number system – whole numbers,**

**fractions and decimals**

1. E3.1 Count, read, write, order and compare numbers up to 1000 E3 2

2. E3.2 Add and subtract using three-digit whole numbers E3 3

3. E3.3 Divide three-digit whole numbers by single- and double- E3 3

digit whole numbers and express remainders

4. E3.4 Multiply two-digit whole numbers by single- and double- E3 3

digit whole numbers

5. E3.5 Approximate by rounding numbers less than 1000 to the E3 3

nearest 10 or 100 and use this rounded answer to check results

6. E3.6 Recognise and continue linear sequences of numbers up E3 1

to 100

7. E3.7 Read, write and understand thirds, quarters, fifths and E3 3

tenths, including equivalent forms

8. E3.8 Read, write and use decimals up to two decimal places E3 2

9. E3.9 Recognise and continue sequences that involve decimals E3 2

**Using common measures, shape and space**

10. E3.10 Calculate with money using decimal notation and express E3 3

money correctly in writing in pounds and pence

11. E3.11 Round amounts of money to the nearest £1 or 10p E3 1

12. E3.12 Read, measure and record time using am and pm E3 1

13. E3.13 Read time from analogue and 24-hour digital clocks in E3 1

hours and minutes

14. E3.14 Use and compare measures of length, capacity, weight E3 3

and temperature using metric or imperial units to the nearest

labelled or unlabelled division

15. E3.15 Compare metric measures of length, including E3 2

millimetres, centimetres, metres and kilometres

**Subject content Level GLH**

16. E3.16 Compare measures of weight, including grams and E3 2

kilograms

17. E3.17 Compare measures of capacity, including millilitres and E3 2

litres

18. E3.18 Use a suitable instrument to measure mass and length E3 1

19. E3.19 Sort 2-D and 3-D shapes using properties, including lines E3 2

of symmetry, length, right angles, angles, including in rectangles

and triangles

20. E3.20 Using appropriate positional vocabulary to describe E3 1

position and direction, including eight compass points and full/

half/quarter turns

**Handling information and data**

21. E3.21 Extract information from lists, tables, diagrams and charts E3 3

and create frequency tables

22. E3.22 Interpret information to make comparisons and record E3 3

changes, from different formats, including bar charts and simple

line graphs

23. E3.23 Organise and represent information in appropriate ways, E3 4

including tables, diagrams, simple line graphs and bar charts

**Revision** E3 2

**Assessment**  E3 2

Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**1** Count, read, write, order and compare numbers up to 1000

**6** Recognise and continue linear sequences of numbers up to 100

Prior knowledge

* Count reliably up to 100 items
* Read, write, order and compare numbers up to 200
* Recognise and sequence odd and even numbers up to 100

Keywords

digit, units, tens, hundreds, thousands, order, difference, compare, most, least, fewest, greatest, smallest, odd, even

Objectives

The learner should be able to:

* count reliably up to 1000 items
* understand that the position of a digit signifies its value
* know what each digit in a three-digit number represents, including the use of a zero as a placeholder
* know how to count on and back starting from any two-digit or three-digit number up to 1000
* recognise the numerals 0–1000
* recognise odd and even numbers
* read numbers up to 1000, including zero
* write numbers up to 1000, including zero
* order and compare numbers up to 1000, including zero
* recognise numbers written in different fonts and styles.

Possible success criteria

* Write three-digit numbers as sums of hundreds, tens and units, e.g. 547 = 500 + 40 + 7.
* Match numbers in figures to numbers in words.
* Given a number in words, write it in digits.
* Extend number sequences.
* Order jumbled number sequences.
* Read numbers in everyday documents and contexts, e.g. signs, notices, adverts, posters.
* Fill in missing numbers in a sequence and on a number line (whole, odd and even numbers).

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the amount of money in four people’s bank accounts (£375, £352, £373, £357).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Order the four amounts of money.

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Identify the person with the most/least money in their account.

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Name the person who has the most/least money in their account.

Common misconceptions

* Learners may lack understanding that the position of a numeral gives it a particular value.
* Learners may lack understanding of the place value of numbers; such difficulties will be especially apparent when ordering numbers such as 212 and 221.
* Learners may struggle with mathematical vocabulary.

Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**2** Add and subtract using three-digit whole numbers

**5** Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results

Prior knowledge

* Recognise and interpret +, −, ×, ÷ and = appropriately
* Add and subtract 2-digit numbers
* Approximate by rounding to the nearest 10, and use rounded answer to check results

Keywords

digit, units, tens, add, plus, sum of, total, equals, is equal to, is the same as, difference, take away, subtract, less than

Objectives

The learner should be able to:

* understand that there are different strategies for adding and subtracting
* add and subtract three-digit whole numbers
* know how to align numbers in column addition and subtraction
* understand place value for units, tens, hundreds and thousands
* understand that subtraction is the inverse of addition
* understand that numbers can be rounded to different degrees of accuracy, e.g. nearest 10, nearest 100
* understand that there are different methods of checking results, e.g. using inverse, using a calculator, approximation by rounding, adding in a different order.

Possible success criteria

* Be aware of different words used for addition and subtraction.
* Use different strategies for mental addition and subtraction.
* Use different strategies for checking results.
* Apply different strategies to add numbers, e.g. breaking down and recombining, looking for pairs which make 10, starting with the largest number and counting on in tens or ones, identifying near doubles.
* Apply mental strategies and written methods to solve problems with whole numbers.
* Round numbers to the nearest 10 or 100 to make approximate calculations.
* Use and interpret +, − and = in practical situations to solve problems.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the amount of money in a person’s bank account (£500) and the amount of a bill that needs to be paid (£346).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Select the amount to be paid and subtract this from the total amount in the bank account (500 − 346 = ?).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Obtain the amount remaining in the bank account (500 − 346 = 154; Check: 500 − 350 = 150).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the amount remaining in the bank account. (State £154 remaining in bank account.)

Common misconceptions

* Learners may not understand the place value of the digits in a calculation.
* Learners may begin adding with the left-hand column first.
* Learners may not realise they will have to add a ‘carried’ number when a number totals more than ten or one hundred.
* Learners may find it difficult to add when a zero is involved. They may not record a zero in the answer.
* Learners may be unaware that addition is associative, e.g. 5 + 1 = 6 and 1 + 5 = 6. If they understand this concept, they will find it much easier to recall the addition facts.
* Learners may believe that they have to add in the order in which the question was asked.
* Learners may be unsure of number order and therefore make mistakes. They may count their starting number, e.g. when finding the number pair 7 + ? = 11, they say ‘7, 8, 9, 10, 11’ and therefore believe the missing number to be 5.
* Learners who lack understanding of place value will continue to make mistakes with column subtraction. Such errors are often dismissed as careless mistakes, when in fact the learner has a weakness in their understanding.
* Learners who lack understanding of exchanging will think subtractions involving zeros cannot be done.
* Misconceptions may occur when inaccurate language is used, e.g. with the calculation 20 − 12, when talking about 20 − 10 learners may refer to this as 2 − 1.
* Learners may begin subtracting with the left-hand column first.
* With tens and units and other formal vertical subtraction calculations, learners may take the smaller unit number from the larger, regardless of whether it is part of the larger or smaller number, e.g. 945 − 237 = 712.
* Learners may not understand the commutative rule and so may believe it is possible to change any addition or subtraction question around, e.g. 8 + 5 = 13 so 8 − 13 = 5.
* Learners may not understand the concept of ‘finding a difference’. They can count on or back but are unsure which method to choose.
* Learners may not understand vocabulary relating to subtraction.

Sensible approximation of an answer by a learner will help them to resolve problems caused by misconceptions.

Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**4** Multiply two-digit whole numbers by single- and double-digit whole numbers

**5** Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results

Prior knowledge

* Recognise and interpret +, −, ×, ÷ and = appropriately
* Multiply whole numbers in the range 0 × 0 to 12 × 12 (times tables)
* Approximate by rounding to the nearest 10, and use rounded answer to check results

Keywords

digit, units, tens, multiple, multiplied by, times, lots of, doubles

Objectives

The learner should be able to:

* multiply two-digit whole numbers by single-digit whole numbers
* multiply two-digit whole numbers by double-digit whole numbers
* understand place value for units, tens and hundreds
* understand that there are different strategies for multiplying
* understand and use the vocabulary of multiplication
* understand that multiplication is repeated addition
* understand that multiplication is commutative, e.g. 12 × 6 = 6 × 12
* understand that numbers less than 1000 can be rounded to different degrees of accuracy, e.g. nearest 10 or nearest 100.

Possible success criteria

* Write repeated addition sums as multiplication and vice versa.
* Use different strategies for multiplying and mental multiplication.
* Use multiplication vocabulary.
* Extend sequences using different multiples.
* Identify patterns for multiples and establish the ‘rules’.
* Round numbers to the nearest 10 and 100 to make approximate calculations.
* Change whole pounds to pence.
* Change whole metres to centimetres.
* Change centimetres to millimetres.
* Use and interpret × and = in practical situations to solve problems.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the number of boxes of rulers a school buys (36). Find the number of rulers in a box (24).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Calculate the total number of rulers (36 × 24 =?).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Find the total number of rulers (36 × 24 = 864; Check: 40 × 20 = 800).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the school has enough rulers for 800 pupils. (Yes, the school has 864 rulers.)

Common misconceptions

* Learners may make place value errors in written multiplication calculations.
* Learners may see multiplication tables as a test of memory, not linked to times tables facts.
* Learners may have limited understanding of ‘adding zero’ when multiplying a number by 10 or 100. This will cause difficulties when working with decimal numbers and fractions.
* Learners may not understand that ×10 and then ×10 again is the same as ×100, or why 6 × 100 and 60 × 10 give the same answer.
* Learners may have limited understanding of multiplication facts and patterns.
* Learners may be confused because spoken numbers (e.g. sixty, seventy, eighty etc.) follow a regular pattern linked to the single digit numbers. However, ten, twenty and thirty do not relate directly to their corresponding single-digit number.

Sensible approximation of an answer by a learner will help them to resolve problems caused by misconceptions.Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**3** Divide three-digit whole numbers by single- and double-digit whole numbers and express remainders

**5** Approximate by rounding numbers less than 1000 to the nearest 10 or 100 and use this rounded answer to check results

Prior knowledge

* Recognise and interpret +, −, ×, ÷ and = appropriately
* Divide two-digit whole numbers by single-digit whole numbers and express remainders
* Approximate by rounding to the nearest 10, and use rounded answer to check results

Keywords

digit, units, tens, division, divided by, share, group, split, halve

Objectives

The learner should be able to:

* divide three-digit whole number by single-digit numbers and express remainders
* divide three-digit whole numbers by double-digit whole numbers and express remainders
* understand and use the vocabulary of division
* understand that there are different strategies for division
* understand that division is repeated subtraction
* understand that division is the inverse of multiplication
* understand that division is not commutative, e.g. 6 ÷ 3 is not the same as 3 ÷ 6
* understand the concept of a remainder, and understand that remainders need to be interpreted in a functional context
* understand that numbers can be rounded to different degrees of accuracy, e.g. nearest 10, nearest 100
* understand place value for units, tens and hundreds.

Possible success criteria

* Use division vocabulary.
* Write repeated subtraction sums as division and vice versa.
* Use different strategies for division and mental division.
* Round numbers to the nearest 10 and nearest 100 to make approximate calculations.
* Interpret remainders in the context of problems.
* Use and interpret ÷ and = in practical situations to solve problems.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the number of roses a florist buys (200 roses). Identify the number of roses needed for each bunch (12).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Calculate the number of bunches that can be made (200 ÷ 12 = ?).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Find the number of bunches that can be made (200 ÷ 12 = 16 with 8 remaining; Check: 16 × 12 = 92).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the number of bunches and the number of roses remaining (16 bunches can be made with 8 roses remaining).

Common misconceptions

* Learners may lack understanding that division is grouping/sharing, i.e. they may lack knowledge of multiplication tables and not fully understand the concept of grouping or ‘chunking’.
* Learners may not understand the concept of ‘inverse’.
* Learners may misunderstand the concept of making a number 10 times smaller; instead, they may prefer to ‘knock off a zero’ and use the same method when a number ends in a different digit.
* Learners may not understand that ÷10 and then ÷10 again is the same as ÷100.
* Learners may confuse the words ‘halving’ and ‘doubling’ and lack understanding that the two operations are linked as they are often taught separately.
* When dealing with remainders, learners may have little understanding of how to represent a remainder as a fraction or a decimal.
* Learners may not understand what the remainder actually represents and ignore the context of the question – should it be rounded up or down?

Sensible approximation of an answer by a learner will help them to resolve problems caused by misconceptions.

Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**7** Read, write and understand thirds, quarters, fifths and tenths, including equivalent forms

Prior knowledge

* Recognise simple fractions (halves, quarters and tenths) of whole numbers and shapes

Keywords

thirds, quarters, fifths, tenths, whole numbers, shapes

Objectives

The learner should be able to:

* know the words thirds, quarters, fifths and tenths and the symbols 1/3, 1/4, 1/5, 1/10
* understand that the bottom number (denominator) indicates the number of equal parts in the whole
* understand that a unit fraction is one part of a whole divided into equal parts
* understand that a non-unit fraction is several equal parts of a whole, indicated by the top number (numerator)
* understand that in unit fractions, the larger the denominator the smaller the fraction; understand that this is not true with non-unit fractions
* understand the connection between third of and share (or divide) into three equal parts
* understand the connection between quarter of and share (or divide) into four equal parts
* understand the connection between fifth of and share (or divide) into five equal parts
* understand the connection between tenth of and share (or divide) into ten equal parts
* know common equivalent fractions, e.g. equivalent to quarters, thirds, fifths, tenths
* understand that equivalent fractions look different but have the same value
* understand that when the top and bottom number of a fraction are the same, this is equivalent to 1.

Possible success criteria

* Match shaded fractions of shapes to fractions.
* Match fractions to words and symbols.
* Read fractions used in everyday material, e.g. newspapers, adverts, catalogues.
* Understand fractions used in sale signs and special offers.
* Estimate equal portions of food to share.
* Give examples of the use of fractions, e.g. measures (one third of a pizza, a fifth of the class are females), time (quarter of an hour), everyday (quarter turn on a tap).

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Find the number of rooms in a hotel (84 rooms) and identify the fraction of rooms not booked (1/3).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Calculate the number of rooms not booked (84 ÷ 3 =?).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Find the number of rooms not booked (84 ÷ 3 = 28).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the number of rooms not booked. (28 rooms are not booked.)

Common misconceptions

* Learners may consider a fraction as a part of a whole ‘one’ (e.g. a strip or a circle) and do not understand that it can be applied to a group of objects, a number or a measurement greater than 1.
* Learners may lack understanding that fractions can be ‘equivalent’ (e.g. the same size but split into a different number of equal parts).

Specification references

**Using numbers and the number system – whole numbers, fractions and decimals**

**8** Read, write and use decimals up to two decimal places

**9** Recognise and continue sequences that involve decimals

Prior knowledge

* Read, write and use decimals to one decimal place

Keywords

digit, units, tens, hundreds, order, difference, compare, most, least, fewest, greatest, smallest, odd, even

Objectives

The learner should be able to:

* understand that the decimal point separates the pounds and pence, or m and cm
* understand the use of a zero as a placeholder, e.g. £1.05 is £1 and 5p
* understand the use of a leading zero, e.g. 0.5 m = 50 cm
* recognise .5 as a half, e.g. 2.5 m = 2½ m
* use a calculator to calculate using whole numbers and decimals to 1dp, to solve problems in context, and to check calculations.

Possible success criteria

* Use a metre rule to show how decimal parts of metres (1dp) are written.
* Use a zero as a placeholder.
* Use a leading zero.
* Read sums of money written in decimal notation, e.g. price tags, price lists, adverts, newspapers.
* Write amounts in pence using decimal notation, e.g. £0.45.
* Select coins to match decimal notation.
* Know how to key in and interpret the displayed digits on a calculator.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the heights of four children (1.23 m, 1.35 m, 1.2 m, 1.02 m).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Put the heights in order of size (1.02 m, 1.2 m, 1.23 m, 1.35 m).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Select the shortest/tallest height (1.02 m/1.35 m).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* State the height of the shortest/tallest person. (The shortest child is 1.02 m./The tallest child is 1.35 m.)

Common misconceptions

* Learners may lack understanding of the place value of decimal fractions, i.e. they may not understand that digits after the decimal point represent parts of a whole.
* Learners may believe numbers with more digits are larger. e.g. 123.45 is larger than 132.5.
* Learners may have difficulties understanding zero because it represents, for some learners, something that does not exist. Numbers which represent quantities less than zero (e.g. 0.12) may also be interpreted as representing the non-existent.
* Learners may be unable to relate fractions to decimals.

Specification references

**Using common measures, shape and space**

**10** Calculate with money using decimal notation and express money correctly in writing in pounds and pence

**11** Round amounts of money to the nearest £1 or 10p

Prior knowledge

* Make money calculations for multiple items using pence up to one pound and in whole pounds and write with the correct symbol (£ or p)

Keywords

pounds, pence, coin, note

Objectives

The learner should be able to:

* add and subtract sums of money using decimal notation
* understand that the same strategies used with numbers can be applied in practical situations using money, e.g. shopping, household bills, orders, pay slips, cost of a small job or work, weekly budget
* make approximate calculations by rounding sums of money to the nearest £ or 10p.

Possible success criteria

* Be able to align decimal points and figures in column addition and subtraction.
* Be able to enter sums of money in a calculator.
* Use a range of written and mental strategies, i.e. addition, subtraction, multiplication and division, to calculate everyday monetary costs.
* Round sums of money to the nearest 10p and make approximate calculations.
* Recognise when to round up to the nearest £, e.g. £1.99 is approximately £2.
* Use approximate calculations to estimate the cost of shopping.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Find the cost of an item (£2.98). Find the value of a voucher (45p).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Deduct the value of the voucher from the cost of the item (2.98 − 0.45 =?).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Find the total amount that needs to be paid (2.98 − 0.45 = 2.53; Check: 3.00 − 0.50 = 2.50).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* State the total amount of money that needs to be paid in pounds and pence. (£2.53 needs to be paid.)

Common misconceptions

* Learners may not understand that the position of a numeral gives it a particular value.
* Learners may be confused by the use of different units of money, e.g. £ or p.
* Learners may find it difficult to identify the operation(s) to be used. This is often due to a misunderstanding of vocabulary, e.g. Find total, more than, +, difference, less than, −, etc.
* Learners may not know what a problem is asking them to do.

Specification references

**Using common measures, shape and space**

**12** Read, measure and record time using am and pm

**13** Read time from analogue and 24-hour digital clocks in hours and minutes

Prior knowledge

* Read and record time in common date formats
* Read time displayed on analogue clocks in hours, half hours and quarter hours
* Understand hours from a 24-hour digital clock
* Know the number of hours in a day and weeks in a year; be able to name and sequence

Keywords

year, month, week, day, hour, minute, date, analogue clock, digital clock, timetable, o’clock, 12-hour clock, 24-hour clock

Objectives

The learner should be able to:

* read time in the 12-hour and 24-hour clock
* measure time in the 12-hour and 24-hour clock
* know the relationship between units of time, e.g. 1 hour = 60 minutes
* add and subtract time in hours and minutes
* convert units of time, e.g. 70 minutes = 1 hour 10 minutes
* record time in the 12-hour and 24-hour clock
* understand and use am and pm
* know that midnight is 00.00 or 0000 and 12.00 or 1200 is midday
* know the units of time, i.e. year, month, week, day, hour, minute.

Possible success criteria

* Match 12-hour and 24-hour clock times.
* Read the time on different analogue clocks using o’clock.
* Read the time on different 24-hour digital clocks.
* Match times in words to different clocks.
* Identify the uses of different time e.g., minutes (sporting events, cooking times, journey times, programmes times), hours (journey times, work times).
* Use TV/cinema/theatre listings to find out the start and finish times of programmes/events on a given day.
* Calculate the length of a programme/performance.
* Use bus/train timetables to find different departure and arrival times.
* Calculate a journey time from a timetable.
* Complete a work time sheet/time planner.
* Use watches and clocks to read and record times of different activities.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the departure and arrival times of a bus journey from a timetable (departs 8:55 am; arrives 11:47 am).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Calculate the journey time. (Select 8:55 and 11:47; show working 5 + 60 + 60 + 47.)

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Indicate the journey time. (5 + 60 + 60 + 47 = 172 minutes or 2 hours 52 minutes; Check: Round 8:55 to 9 o’clock and 11:47 to 12 o’clock = 3 hours.)

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the journey time. (The length of the journey is 2 hours 52 minutes.)

Common misconceptions

* Learners may be confused by the terms am and pm.
* Learners may find it difficult to use a calculator to calculate time.

Specification references

**Using common measures, shape and space**

**14** Use and compare measures of length, capacity, weight and temperature using metric or imperial units to the nearest labelled or unlabelled division

**15** Compare metric measures of length, including millimetres, centimetres, metres and kilometres

**18** Use a suitable instrument to measure mass and length

Prior knowledge

* Use metric measures of length, including millimetres, centimetres, metres and kilometres.
* Read and use simple scales to the nearest labelled division.

Keywords

size, length, width, height, metric units, imperial units, millimetres, centimetres, metres, kilometres

Objectives

The learner should be able to:

* understand and use vocabulary related to measures of length, width and height
* know the standard metric units of length, including abbreviations (km, m, cm, mm) and be able to relate the measurements to familiar things
* know the standard imperial units of length, including abbreviations (ins, ft, yards, miles) and be able to relate the measurements to familiar things
* understand scales of length to the nearest labelled or unlabelled division
* understand mm, cm, m and km divisions on simple scales
* obtain measurements of different items using a suitable measuring instrument
* compare measurements of length in one metric measurement to another, e.g. mm and cm, cm and m
* know how to use a ruler to draw and measure lines.

Possible success criteria

* Know vocabulary related to measures of length, width and height.
* Know that 10 mm = 1 cm, 1000 mm = 1 m, 1000 m = 1 km.
* Suggest appropriate units to measure, e.g. a nail, height of a door, tennis court, distance to London.
* Know the units used for measuring longer distances, e.g. kilometres, miles.
* Understand a distance on a road sign when travelling by bus or car.
* Read scales to the nearest labelled or unlabelled division.
* Provide distances to nearby places, e.g. towns and cities. Rank them in order.
* Know how to use a simple scale to estimate distance on a road map.
* Estimate, measure and record lengths in different units, for different items, using different measuring instruments.
* Draw and measure lines of different lengths using a marked ruler.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Find five measurements of rugs (2.25 m, 2.6 m, 1.2 m, 2.75 m, 2.15 m).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Order the five measurements (1.2 m, 2.15 m, 2.25 m, 2.6 m, 2.75 m).

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Select a rug which is at least 2.1 m long but no longer than 2.2 m (2.15 m).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the length of the rug chosen. (The length of the rug is 2.15 m).

Common misconceptions

* Learners may lack understanding of the vocabulary for length, width and height.
* Learners may be confused by different units of measurement.

Specification references

**Using common measures, shape and space**

**14** Use and compare measures of length, capacity, weight and temperature using metric or imperial units to the nearest labelled or unlabelled division

**16** Compare measures of weight, including grams and kilograms

**17** Compare measures of capacity, including millilitres and litres

**18** Use a suitable instrument to measure mass and length

Prior knowledge

* Use measures of weight, including grams and kilograms
* Use measures of capacity, including millilitres and litres
* Read and compare positive temperatures
* Read and use simple scales to the nearest labelled division

Keywords

weight, capacity, grams, kilograms, millilitres, litres, thermometer, scales, Celsius

Objectives

The learner should be able to:

* understand and use vocabulary related to weight
* know the standard metric units of weight, including abbreviations (kg, g) and be able to relate the measurements to familiar things
* know the standard imperial units of length, including abbreviations (lbs, oz) and be able to relate the measurements to familiar things
* understand scales of weight to the nearest labelled or unlabelled division
* understand g and kg divisions on simple scales
* obtain weights of different items using a suitable measuring instrument
* compare weights in one metric measurement to another, e.g. g, kg
* understand and use vocabulary related to capacity
* know the standard metric units of capacity, including abbreviations (ml, cl, l) and be able to relate the measurements to familiar things
* know the standard imperial units of capacity, including abbreviations (fl oz, pt, gal) and be able to relate the measurements to familiar things
* understand scales of capacity to the nearest labelled or unlabelled division
* obtain capacity of different items using a suitable measuring instrument.

Possible success criteria

* Be aware of vocabulary used to measure weight and capacity.
* Know that 1000 g = 1 kg and 1000 ml = 1 litre.
* Know metric units of weight and capacity.
* Know imperial units of weights and capacity.
* Know which instrument is appropriate for measuring differing weights and capacities.
* Understand that temperature can be measured on different scales, but that Celsius is the standard scale in the UK.
* Read scales to the nearest labelled or unlabelled division.
* Estimate, measure and record weight, capacity and temperature in different units, for different items/situations, using different measuring instruments.
* Be aware that temperature units could be in Celsius or Fahrenheit.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Identify the units of measurement on a given scale (weighing scales, measuring jug, thermometer).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Read the scale accurately to the nearest labelled or unlabelled division.

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Indicate the weight, capacity or temperature.

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the weight, capacity or temperature.

Common misconceptions

* Learners may lack understanding of the vocabulary for weight, capacity and temperature.
* Learners may be confused by different units of measurement.

Specification references

**Using common measures, shape and space**

**19** Sort 2-D and 3-D shapes using properties, including lines of symmetry, length, right angles, angles, including in rectangles and triangles

Prior knowledge

* Recognise and name 2-D and 3-D shapes, including pentagons, hexagons, cylinders, cuboids, pyramids and spheres
* Describe the properties of common 2-D and 3-D shapes, including numbers of sides, corners, edges, faces, angles and base

Keywords

2-D, 3-D, faces, rectangle, square, circle, triangle, pentagon, hexagon, cylinder, cube, cuboid, pyramid, sphere, side, corner, edge, face, angle, right angle, base, equal, symmetry, length, degree, parallel, tessellation

Objectives

The learner should be able to:

* identify regular 2-D and 3-D shapes
* know the properties of regular 2-D shapes
* know the properties of regular 3-D shapes
* know that angles are measured in degrees
* know that a right angle is 90° or a quarter turn
* understand the meaning of parallel and recognise parallel lines
* identify which regular shapes tessellate, i.e. fit together without a gap
* identify the lines of symmetry in shapes and images.

Possible success criteria

* Sort 2-D shapes using properties, e.g. number of angles/right angles, lines of symmetry, number of equal sides, number of parallel lines.
* Sort 3-D shapes using properties, e.g. number of faces, number of corners.
* Draw a floor plan to show a room layout.
* Plan a tiling pattern using any shape or combination of shapes for a wall or floor.
* Stack 3-D shapes of the same size on a shelf, e.g. cans (cylinders), boxes (cuboids).
* Sketch the lines of symmetry in shapes and images.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the two shapes required to form a tessellating pattern (hexagon and square).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Plan the tessellation using the two given shapes.

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Draw the tessellating pattern.

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the two shapes can tessellate.

Common misconceptions

* Learners may be confused by the change of vocabulary between 2-D and 3-D, e.g. when sides become faces.
* Learners may believe parallel lines need to be the same length.
* Learners may think that all polygons have the same number of lines of symmetry as they do number of sides/angles.

Specification references

**Using common measures, shape and space**

**20** Use appropriate positional vocabulary to describe position and direction, including eight compass points and full/half/quarter turns

Prior knowledge

* Use appropriate positional vocabulary to describe position and direction, including between, inside, outside, middle, below, on top, forwards and backwards

Keywords

position, direction, compass points, full/half/quarter turns

Objectives

The learner should be able to:

* understand everyday positional vocabulary to describe position and direction.

Possible success criteria

* Describe position using positional vocabulary, e.g. full/half/quarter turns.
* Provide directions using positional vocabulary, e.g. eight compass points.
* Follow spoken instructions or directions using positional vocabulary.
* Follow written instructions or directions using positional vocabulary.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Use a given map to provide written instructions to get to a stated destination.

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Use positional vocabulary to give directions.

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Use positional vocabulary to give directions explaining the route to follow to arrive at the stated destination.

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the direction of travel using one of the eight compass points.

Common misconceptions

* Learners may lack understanding of positional vocabulary.
* Learners may confuse left and right.

Specification references

**Handling information and data**

**21** Extract information from lists, tables, diagrams and charts and create frequency tables

**22** Interpret information, to make comparisons and record changes, from different formats, including bar charts and simple line graphs

Prior knowledge

* Extract information from lists, tables, diagrams and bar charts
* Make numerical comparisons from bar charts

Keywords

lists, tables, diagrams, pictograms, bar charts, line graphs, frequency tables, title, label, key, scale, row, column, list, numerical, alphabetical

Objectives

The learner should be able to:

* understand that a title, label and key provide information
* know how to read the scale on an axis
* know how to use a simple scale such as 1 cm to 1 m
* know how to obtain information from a pictogram, pie chart, bar chart or single line graph
* understand that comparisons can be made based on the height or length of the bars, or the number of pictures.

Possible success criteria

* Obtain information from tables in price lists, catalogues, brochures and websites.
* Obtain numerical information from given charts.
* Obtain information from given diagrams or drawings in a practical context, e.g. floor plan.
* Use a frequency table to record data in different categories.
* Understand diagrams, e.g. floor plans, dimensions with use of the title, labels and key.
* Understand information given in charts (e.g. in newspapers, magazines, catalogues, websites, etc.) and obtain key facts.
* Understand information given in simple line graphs, such as sales figures, temperature etc.
* Understand information given in charts with use of the title, labels and key.
* Make numerical comparisons, using scales on bar charts.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* From a line graph for changing temperature from degrees Celsius (°C) to degrees Fahrenheit (°F), find 35°C in degrees Fahrenheit (°F).

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Start at 35°C on the vertical axis, move straight across to the line and go directly down to the horizontal axis.

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Indicate the value on the horizontal axis (95°F).

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm 35°C = 95°F.

Common misconceptions

* Learners may lack understanding of the vocabulary used for handling information and data.
* Learners may find it confusing when information is not ordered logically.
* Learners may find it difficult to interpret a scale to extract and interpret information.
* Learners may find it difficult to choose a scale to use for a block diagram/graph.

Specification references

**Handling information and data**

**23** Organise and represent information in appropriate ways, including tables, diagrams, simple line graphs and bar charts

Prior knowledge

* Sort and classify objects using two criteria
* Take information from one format and represent the information in another format, including use of bar charts

Keywords

sort, represent, group, tally chart, frequency table, title, axis, scale, key, tables, diagrams, line graphs, bar charts

Objectives

The learner should be able to:

* sort, classify and record collected data
* know how to present data in tables, diagrams, simple line graphs and bar charts
* understand the different elements in tables, charts and diagrams, e.g. title, axis, scale, key
* know how to use a simple scale to represent data, e.g. 1 cm = 1 m
* label tables, charts, graphs and diagrams.

Possible success criteria

* Choose suitable categories for collection of different types of data.
* Classify data appropriately.
* Record collected data in a suitable format.
* Translate data in a tally chart into a frequency table.
* Produce a timetable or plan.
* Produce a simple room plan showing the location of main features.
* Display collected data relevant to work, training or leisure interests in a suitable format.

Opportunities for solving mathematical problems and decision making

Entry Level 3 learners are expected to be able to:

* use given mathematical information, including numbers, symbols, simple diagrams and charts
* recognise, understand and use simple mathematical terms appropriate to Entry Level 3
* use the methods given above to produce, check and present results that make sense to an appropriate level of accuracy
* present results with appropriate and reasoned explanation using numbers, measures, simple diagrams, charts and symbols appropriate to Entry Level 3.

The context for simple problems at this level should be familiar to all learners.

Examples of opportunities

Learners are required to extract information given in relevant real-world contexts, e.g.

* Obtain the number of different trees in a park from a tally chart.

Learners are required to select and perform appropriate calculations in order to find the correct answer to a problem.

Learners will need to identify and extract key information to decide on the process to use.

Learners will need to use facts and terminology accurately.

E.g.

* Draw a bar chart to show the number of different trees in the park. (Give the chart a suitable title, label the horizontal and vertical axes, and choose an appropriate scale.)

Learners are required to obtain and present results and check their own working to an appropriate level of accuracy necessary for the specific task.

Learners are required to present results within the parameters specified in the question.

E.g.

* Draw the required bars for the different types of tree.

Learners are required to show working or produce results in order to gain marks. This working rationalises the answer they present.

Learners are expected to interpret their results and provide a decision.

E.g.

* Confirm the number of a specific type of tree or compare the number of two different types of tree,

Common misconceptions

* Learners may lack understanding of the vocabulary relating to sorting and classifying.
* Learners may find it difficult to choose and use a suitable scale.