Ma
LEVELS
3-5

Y5

Optional mathematics tests

Teacher's guide

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QCA
Guarding standards

department for
education and skills
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Contents

Introduction

Since the introduction of optional tests for years 3, 4 and 5 from 1997, there has been much development in the teaching of mathematics. In order to reflect the changes, including the now widespread use of the National Numeracy Strategy framework for teaching, new optional tests have been developed. Although the majority of primary schools use the existing tests and teachers are accustomed to their administration and marking, many have welcomed the idea of a fresh approach to optional testing.

The years 3, 4 and 5 optional tests in mathematics offer schools a means of monitoring and measuring children's progress in the years between the statutory tests in years 2 and 6. They form part of the Government's drive to raise standards at key stage 2. The results will help schools plan for teaching and learning, in order to meet targets for achievement by the end of key stage 2.

This series can be used to track progression reliably not only between years 3, 4 and 5, but also to link it confidently to the end of key stages 1 and 2 tests on either side. During the standardisation phase of development, large numbers of children completed various components of the new tests as well as the 2003 statutory tests in order to establish a statistical link between the optional and statutory tests.

The main changes to the mathematics tests are the inclusion of more questions that require children to use their skills in using and applying mathematics. These include explaining the reason for a solution or choosing an appropriate strategy to attempt a problem.

The balance of marks within the tests will reflect the structure of the national curriculum.

Unlike the statutory tests, these optional materials are not due to be replaced annually and schools will need to store or re-order materials from year to year, as has been the case previously.

This Guide will provide the user with information needed to administer and mark the tests.

Information to cover national curriculum levels and age standardised scores is due to be sent to schools after the test administration period. Teachers can fill in the table on page 48 when this information is available.

The structure and timing of the tests

Each child will sit three tests: two written mathematics tests and a mental mathematics test. It is recommended that:

- one written mathematics test and the mental mathematics test are administered on one day and the other written mathematics test on the following day; and

- at least one written mathematics test is administered before the mental mathematics test.

The tests are suitable for children working within levels 3-5. To assess children working below level 3, use teacher assessment only.

Written tests

Each written test contains 35 marks and has a recommended time limit of 45 minutes.

There are two tests, Test *5A* (calculator not allowed) and Test 5B (calculator allowed). Calculators must be available for Test 5B. The tests contain mainly level 3 and level 4 questions but approximately one-fifth of the questions assess level 5.

Mental mathematics test

The mental mathematics test is a taped test consisting of 20 timed questions with a running time of approximately 20 minutes. The questions are designed to assess mental recall and mental agility. Each question is worth one mark. The test should be administered using the audiotape, although a transcript is provided on pages 13-15 in case the equipment or tape malfunctions on the day of the test. Each question is repeated twice and children are given either 5, 10 or 15 seconds to write their response. The test is similar in style to the mental mathematics test at the end of key stage 2.

Mark schemes and analysing the results

Separate mark schemes for each test are provided on pages 20-36.

Optional grids for test analysis

QCA has produced grids giving national curriculum references for each question, which will allow teachers, if they wish, to analyse the performance of children in their class.

Organisation

Grouping children for the test

Both the mental and written tests can be administered to all children at the appropriate levels together, in small groups or individually. For the written tests, you may give help with reading. Your decision about grouping, therefore, should reflect the needs of children in your class and their ability to work independently.

Assistance

The test does not require the use of staff beyond those normally available in the classroom. However, any informed person, such as a language support teacher, a teaching assistant or special educational needs support staff, may administer it, under the direction of the teacher. These staff should be aware of the guidance in the section 'Assisting with the written tests' on page 10. The teacher, however, remains responsible for the assessments. Parents of children in the class should not administer the tests.

Special arrangements

The tests have been designed to be accessible to the majority of children working within the levels targeted by the tests. Schools are free to make adaptations to the tests, which will improve accessibility for children for whom English is an additional language and for children with special educational needs, provided any adaptations made do not invalidate the assessments. These adaptations should be similar to those made to the materials with which children work in the classroom and should be based on the special arrangements for the end of key stage 2 statutory mathematics tests.

Examples of reasonable adaptations include:

■   use of readers, signers, amanuenses;

■   using tactile shapes and number cards;

■   photocopying onto coloured paper;

■   enhancing the shading on diagrams and/or emboldening lines on diagrams, charts and graphs to increase visual clarity;

■   enlarging diagrams, cutting them out, embossing or mounting them on card or other material according to normal classroom practice;

■   translation of words or phrases in the tests that are likely to prove difficult for children for whom English is an additional language and also for some children who use British Sign Language or other sign-supported communication;

■   using mechanical and technological aids, including computers but not calculators except for Test 5B; and

■   allowance of up to 25 per cent additional time as allowed in the *Assessment and reporting arrangements* for key stage 2.

Special arrangements should not provide an unfair advantage. It is important to ensure that any assistance given does not alter the nature of the test questions, and that any answer given is the child's own.

Children with special educational needs

Support may be given to poor readers in the written mathematics tests by reading words, phrases or sentences that they find difficult. Instructions may also be clarified for them provided this does not give additional information or invalidate the assessment; mathematical vocabulary cannot be changed.

The most appropriate conditions for testing children with special educational needs are likely to be those in which they normally work well. The tests can be administered to small groups of children or, for some children, on an individual basis. Some children may need encouragement to continue working through the rests. As well as offering reassurance to the whole group, you may also need to be active in watching for children who have problems with reading the questions or with writing their responses.

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Children learning English as an additional language

Children who are learning English as an additional language may be given access to the test in any way that is usual for them. If language support is available, the questions may be translated and children may respond in a language other than English. It is not intended that children are provided with a comprehensive written translation of the test. As with all children, you may read the questions aloud in English. You may also give a fuller explanation of the context of the questions, but it is important to ensure that you do not give any additional interpretation of the mathematics or mathematical vocabulary in doing this. It is particularly important when assessing children for whom English is an additional language that sufficient support is given for the children to show their best attainment.

Administering the written tests

Equipment

For each of the written tests, Test *5A* and Test 5B, each child will need:

- a mathematics test booklet, available in multiple copies from QCA Publications;

- a pen or pencil;

- a sharp pencil for mathematical drawing;

- a ruler marked in centimetres and millimetres;

- a protractor (or angle measurer);

- access to mirrors and tracing paper; and

- a rubber (optional).

Although this equipment should be available, it may not necessarily be required to be used on the tests.

For Test 5B, each child will also need:

- a calculator.

Encourage the children to cross out, rather than rub out, incorrect answers and to write their new answer by the side. Rubbing out not only takes time but also loses important information for marking and analysis. If rubbers are not provided, have a rubber available for children who wish to change answers where the changes may be clearer by rubbing out than by crossing out, for example for shapes they have drawn or shaded.

Please note:

Do not supply the children with any other support materials, for example clocks or clock faces, number lines or squares, addition squares, multiplication squares, calculators or any representation of money (toy or real).

Wall displays such as calendars, tables charts, number lines or number squares should be covered or removed. However, it is not necessary to remove wall clocks.

The tests should be carried out under test conditions; they may be held in a classroom, school hall or any other suitable accommodation. The room(s) where the tests are to be administered will need to be prepared appropriately.

Children should be seated in such a way as to prevent copying.

Explain that:

■ each question always has its number in the black shape at the left-hand side;

■ some of the questions have boxes in which to write answers but for others there may be a dotted line or they may be asked to complete a graph or sorting diagram. A pencil icon always indicates the space where the children are required to record their answers;

■ they can use any of the space on the page for working out but they should write their answer in the space indicated by the pencil icon;

■ emphasise that they should read each instruction very carefully and ask for help with reading if necessary; and

■ they should not write in the white boxes in the margins.

To ensure that the testing is carried out in a standard way in all schools, it is important that your introduction does not exceed this information.

Assisting with the written tests

You should:

■ give help with reading words or sentences, where necessary. You may need to be aware of children who do not ask for the help they need to read unfamiliar words.

In a minority of cases, a child may need to have the entire test read out to him or her. Where readers are used, they will need to be familiar with the following information.

You should not:

■ give any help with the mathematics as this will invalidate the assessment;

■ suggest to the children the mathematical operation to use;

■ give clues which help the children to interpret what any question requires them to do, for example you may read out the phrase *fractions that are equivalent* in question 27 in Test 5B, but do not give any clues about its meaning;

■ rephrase the wording of the questions (other than rephrasing words as explained in the following paragraph), since this is part of what is being assessed;

■ prompt the children to confirm or change answers by pointing, frowning, smiling, head shaking or nodding, offering rubbers, or asking leading questions; or

■ suggest different representations from the one provided. For example, do not re-present questions on addition or subtraction vertically when they are presented horizontally in the test booklet.

General instruction words used in the test may be explained or rephrased if they are not familiar to the children, for example the word *complete* in question 7 in Test 5A may be explained since it is not a mathematical term and not part of what is being assessed. Similarly, words which are used in everyday contexts only may be explained or rephrased if they are not familiar, for example *chocolate bar* in question 17 in Test 5A or *sponsored silence* in question 17 in Test 5B.

Teachers of children with special educational needs or of children learning English as an additional language should refer to 'Special arrangements' on pages 5 and 6.

Working through the written tests

Tell the children to write their names and class on the front cover of the booklet.

Ask the children to turn to page 3, which contains instructions. Read through the instructions with the children, ensuring that the children understand them.

Test A

Instructions

You **may not** use a calculator to answer any questions in this test.

Work as quickly and as carefully as you can.

You have 45 minutes for this test.

If you cannot do one of the questions, go on to the next one.

You can come back to it later, if you have time.

If you finish before the end, go back and check your work.

Follow the instructions for each question carefully.

This shows where you need to put the answer.

If you need to do working out, you can use any space on a page

Some questions have an answer box like this:

Show your working. You may get a mark.

For these questions you may get a mark for showing your working.

Test B

Instructions

You **may** use a calculator to answer any questions in this test.

Work as quickly and as carefully as you can.

You have **45 minutes** for this test.

If you cannot do one of the questions, **go on to the next one.**
You can come back to it later, if you have time.

If you finish before the end, **go back and check your work**

Follow the instructions for each question carefully.

This shows where you need to put the answer.

If you need to do working out, you can use any space on a page

Some questions have an answer box like this:

Show your method You may get a mark.

For these questions you may get a mark for showing your method.

Explain that:

- each question always has its number in the black shape at the left-hand side;

- some of the questions have boxes in which to write answers but for others there may be a dotted line or they may be asked to complete a graph or sorting diagram. A pencil icon always indicates the space where the children are required to record their answers;

- they can use any of the space on the page for working out but they should write their answer in the space indicated by the pencil icon;

- emphasise that they should read each instruction very carefully and ask for help with reading if necessary; and

- they should not write in the white boxes in the margins.

To ensure that the testing is carried out in a standard way in all schools, it is important that your introduction does not exceed this information.

Assisting with the written tests

You should:

- give help with reading words or sentences, where necessary. You may need to be aware of children who do not ask for the help they need to read unfamiliar words.

In a minority of cases, a child may need to have the entire test read out to him or her. Where readers are used, they will need to be familiar with the following information.

You should not:

- give any help with the mathematics as this will invalidate the assessment;

- suggest to the children the mathematical operation to use;

- give clues which help the children to interpret what any question requires them to do, for example you may read out the phrase *fractions that are equivalent* in question 27 in Test 5B, but do not give any clues about its meaning;

- rephrase the wording of the questions (other than rephrasing words as explained in the following paragraph), since this is part of what is being assessed;

- prompt the children to confirm or change answers by pointing, frowning, smiling, head shaking or nodding, offering rubbers, or asking leading questions; or

- suggest different representations from the one provided. For example, do not re-present questions on addition or subtraction vertically when they are presented horizontally in the test booklet.

General instruction words use in the test may be explained or rephrased if they are not familiar to the children, for example the word *complete* in question 7 in Test 5 A may be explained since it is not a mathematical term and not part of what is being assessed. Similarly, words which are used in everyday contexts only may be explained or rephrased if they are not familiar, for example *chocolate bar* in question 17 in Test 5A or *sponsored silence* in question 17 in Test 5B.

Teachers of children with special educational needs or of children learning English as an additional language should refer to 'Special arrangements' on pages 5 and 6.

Administering the mental mathematics test

It is recommended that the mental mathematics test is administered after one of the written tests. In these circumstances, allow a break of at least 15 minutes between them.

There is one mental mathematics test. It is a taped test consisting of a practice question and 20 timed questions. The tape has a running time of approximately 20 minutes. It starts with instructions to the children followed by the questions. There will be two opportunities for you to pause the tape. These will be indicated by a bleep. The first pause comes near the beginning of the tape, once the instructions have been given. This will allow clarification of any of the instructions not understood by the children. The second pause is after the practice question. After this second pause, the tape should be allowed to play without interruption.

The mental mathematics test is organised in three sections. Each section includes easy and more difficult questions, arranged so that the easier questions are at the beginning of the section. This means that there are a number of relatively difficult questions early in the test with some relatively easy questions later. Children should be made aware that questions will vary in difficulty.

Equipment

You will need:

■ an audiotape cassette recorder; and

■ an audiotape of the mental mathematics test. Each

child will need:

■ a copy of the Year 5 mental mathematics test answer sheet (photocopiable from the final two pages in the *Teacher's guide* or available in multiple copies from QCA Publications); and

■ a pen or pencil.

Please note:

Children should have only pens or pencils. They should not have rubbers, rulers, calculators or any other mathematical equipment. Access to paper for working out answers is not allowed but the children may jot things down outside the answer box on their answer sheets if this helps them. They should be made aware that they must answer in the allocated time for each question and that recording extensive written working may slow down their responses.

Introducing the mental mathematics test

Ensure that each child has a copy of the mental mathematics test answer
sheet. Tell the children to write their name and class in the box at the top of it.

Ensure the children understand that:

- they must complete the test on their own without copying or discussing questions
  with other children;

- they will be told how long they have to answer each question and that the time
  given will increase from 5 to 10 to 15 seconds as the test progresses through the
  three sections;

- for some of the questions, the information they will need is included in or beside
  the answer box on the children's answer sheet;

- they are not allowed to use a calculator or any other mathematical equipment;

- they should work out the answer to each question in their head but they may jot
  things down outside the answer box if it will help them;

- if they want to change their answer they should put a cross through their first
  answer. They are not allowed to rub out any answers;

- they should answer as many questions as they can. If they find a question too
  difficult, they should put a cross in the answer box and wait for the next question;

- they should not interrupt the test by asking any questions once the test has
  started;

- they should not write in the white boxes in the margins.

Working through the mental mathematics test

When you are ready, start the tape. Instructions will be given to the children. The
tape will indicate with a bleep, where you should stop and answer any questions.

When the bleep is heard, stop the tape and answer any questions that the children
may have, to ensure that the instructions are clearly understood.

Start the tape. The children will be asked a practice question. After a 5-second pause
for the children to write their answer a bleep will sound, indicating that you should
stop the tape again to answer any questions.

After stopping the tape, ensure that the children have correctly placed their answer to
the practice question on the answer sheet and that they are aware of the information
provided to the right of the answer box for some questions.

When they are read) to begin the test, tell the children that you will not be able to
stop the tape again, or answer any questions once the tape has restarted.

Restart the tape and the test will begin. At the end of the test, children will be told to
put down their pens and pencils, and you should switch off the tape and collect in the
answer sheets.

If the equipment or tape malfunctions, the test will need to be read to the children.
Instructions and a copy of the transcript for introducing the mental mathematics test
in such an event follow.

Emergency use of tape transcript

This section contains a transcript for the teacher-read version of the year 5 mental mathematics test. It should be used **only** in the **event of** equipment or tape failure. In such an event, you should follow the instructions below.

1. You must have access to a clock or watch that measures accurately in seconds.

2. Give out the appropriate equipment as stated on page 11 and read through with the children 'Introducing the mental mathematics test' on page 12.

3. Read out the following script, **using exactly these words:**

Listen carefully to the instructions I am going to give you. When I have finished reading them, I will answer any questions. However, you will not be able to ask any questions once the test has begun.

I will start by reading a practice question. Then I am going to ask you 20 questions for the test. On your sheet there is an answer box for each question, where you should write the answer to the question and nothing else. You should work out the answer to each question in your head, but you may jot things down outside the answer box if this helps you. Do not try to write down your calculations because this will waste time and you may miss the next question. For some of the questions, important information is already written down for you on the sheet.

I will read out each question twice. Listen carefully both times. You will then have time to work out your answer. If you cannot work out an answer, put a cross in the answer box. If you make a mistake, cross out the wrong answer and write the correct answer next to it.

There are some easy and some harder questions, so don't be put off if you cannot answer a question.

4. Stop and answer any questions that the children may have.

5. Read out the following:

Here is the practice question to show you what to do.

I will read the question twice, and you will have S seconds to work out the answer and write it in the answer box.

What is double eight'

6. Repeat the question.

What is double eight?

Wait 5 seconds (measured accurately using a clock or watch), then read out the following:

Now put down your pen or pencil.

7. Ensure that the children have correctly placed their answers to the practice question on their answer sheet. Remind the children that, for some questions, information is provided in or beside the answer sheet. When they are read)' to begin the test, tell the children that you will not be able to answer any further questions, or interrupt the test, once you have started reading the questions.

1 3

8. The questions follow. They must be read out exactly as written. Start by saying the question number, then read out each question twice in quick succession before leaving the 5- or 10- or 15-second response time. These timings **must** be **strictly** adhered to.

9. At the end of the test, tell the children to put down their pens or pencils, then collect their answer sheets.

Test questions

'Now *we are ready to start the test. For this group of questions you will have 5 seconds to work out each answer and write it down.'*

1	What is twenty-seven subtract nine?
2	What must be added to eighty-three to make one hundred?
3	How many hundreds are there altogether in two thousand four hundred?
4	What is double sixty-seven?
5	Divide thirty-one point five by ten.

'*For the next group of questions, you will have 10 seconds to work out each answer and write it down.'*

6	I pay three pounds sixty pence for **a** rail ticket. How much change should I get from a five pound note?
7	What is five multiplied by four multiplied by two?
8	How many days are there altogether in June and July?
9	A tin of baked beans weighs four hundred grams. How many grams less than one kilogram is this?
10	Look at the times on your answer sheet. Put a ring around the time which is the same as seventeen-fifteen.
11	What number is one hundred and ninety-nine more than four hundred and twenty-eight.
12	Look at your answer sheet. What percentage of the bar is shaded?
13	The perimeter of a regular octagon is forty centimetres. What is the length of each side?
14	A bottle holds a quarter of a litre. Write this amount in millilitres.
15	Look at your answer sheet. Put a ring around the fraction which is equivalent to two-thirds.

Now turn *over your sheet.'*

For the next group of questions, you will have 15 seconds to work out each answer and write it down.'

16	Add together thirteen, forty-seven and twenty-one.
17	Nineteen marbles are shared between some children. Each child receives six marbles and there is one marble How many children share the marbles? left over.
18	Joe has some pocket money. He spends three-quarters of it. He has fifty pence left. How much pocket money did he have?
19	What is the difference between one thousand nine hundred and ninety-four and four thousand and three?
20	How many edges has a triangular prism?

'Now put down your pen or pencil. The test is finished.'

Marking the tests

You should mark the test in accordance with the guidance given. The general guidance on pages 18-19 should be used in conjunction with the mark schemes, and you should read this before you begin marking.

The mark schemes help to identify the appropriate answers and tell you how many marks to allocate to each answer. Mark boxes have been provided in the right-hand margin of the test booklet beside each question. It is recommended that you fill in the mark boxes as follows: 1 for mark awarded; 0 for question attempted but no mark awarded; - (dash) for question omitted. These codes correspond with those used for filling in the optional grids for test analysis.

If a child has altered an answer or the answer is not clear, try to establish what the original intention was. You may, on occasion, need to talk with the child individually to check this. Be sure to ask questions that do not suggest the required answer, for example *What is your answer here?*

For the written tests, we recommend that you mark the same double-page spread for the whole class before turning to the next double-page spread. This will make it easier for you to concentrate on a small section of the mark scheme at a time and on the working mark guidance (where appropriate). It also means that you are more likely to gain diagnostic information about particular questions to inform your teaching. The mark schemes have been designed to facilitate marking double-page spreads.

The structure of the mark schemes

The marking information for each question is set out in the form of tables, which start on page 20.

The 'Question' column on the left-hand side of each table provides a quick reference to the question number and the question part.

The 'Mark' column indicates the total number of marks available for each question part.

Where the codes U1 or U2 have been inserted into the mark column, this means that the key focus for the assessment is using and applying mathematics. This could be for problem solving, communicating and/or reasoning, as detailed in the programme of study for key stage 2 mathematics. The codes U1 or U2 mean that either 1 mark or 2 marks can be attributed to using and applying mathematics.

The 'Requirement' column may include two types of information:

- a statement of the requirements for the award of each mark, with an indication of whether credit can be given for correct working; and

- examples of some different types of correct response.

The 'Additional guidance' column indicates alternative acceptable responses, and provides details of the range of acceptable answers. This column also indicates unacceptable responses which should not be awarded a mark.

In order to ensure consistency of marking, the most common marking errors and difficulties are addressed in the general guidance with the action the marker should take. Unless otherwise specified in the mark scheme, markers should apply these general guidelines in all cases.

The general guidance and the mark schemes for the written mathematics tests and the mental mathematics test can be found on the following pages:

It is important that marking is carried out accurately according to the appropriate mark scheme to ensure consistency of results.

General guidance

What if...

... the child reverses digits when recording:	Reversed digits are acceptable if they are clearly recognisable as the digit intended; for example, a reversed 2 must clearly show the characteristics of a 2 rather than a 5.
... the child writes a transposed number as the answer?	Transposed numbers should not be awarded the mark; for example, an answer of '16' when the correct answer is '61' should not be marked as correct.
... the child's response is numerically equivalent to the answer in the mark scheme?	The mark scheme will generally specify which equivalent responses are allowed. If this is not the case, award the mark unless the mark scheme states otherwise.
... the child's answer is correct but the wrong working is shown?	Always award the mark for a correct response unless the mark scheme states otherwise.
... the correct response has been crossed (or rubbed) out and not replaced?	Mark any legible crossed out work that has not been replaced according to the mark scheme. If the work has been replaced, then do not consider the crossed out work.
... the child has worked out the answer correctly and then written an incorrect answer in the answer box?	Give precedence to the answer given in the answer box over any other workings. However, there may be cases where the incorrect answer is due to a transcription i error, in which case you may check the child's 1 intention and decide whether to award the mark.
... more than one answer is given?	If all answers given are correct (or a range of answers is given, all of which are correct), award the mark unless the mark scheme states otherwise. If both correct and incorrect responses are given, do not award the mark unless the mark scheme states otherwise.
... the child's response does not match closely any of the examples given in the mark scheme?	Judge whether the response corresponds with the requirements in the 'Requirement' column of the mark scheme. Refer also to the 'Additional guidance' column and to the 'Working mark guidance' (where appropriate).

What if...
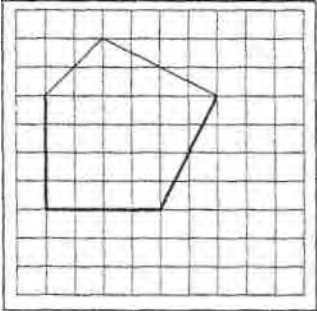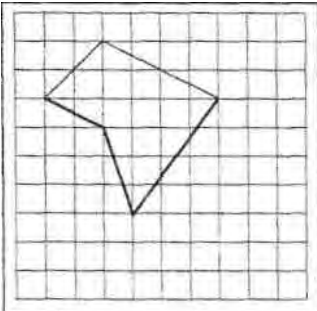
... there appears to be a misread of numbers affecting the working?	In general, the mark should not be awarded. However, in two-mark questions that have a working mark, award one mark if the working is applied correctly using the misread numbers provided that the misread numbers are comparable in difficulty to the original numbers. For example, if '243' is misread as '234', both numbers may be regarded as comparable in difficulty.
...no answer is given in the expected place, but the correct answer is given elsewhere?	Where a child has shown understanding of the question, award the mark. In particular, where a word or number response is expected, a child may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.
... the child's answer correctly follows through from earlier incorrect work?	'Follow through' marks may be awarded only when specifically stated in the mark scheme. Either the correct response or an acceptable 'follow through' response should be marked as correct.

Mark scheme for Test 5A

Test 5A questions 1-4

Question	Requirement	Mark	Additional guidance
1	1031	**1m**	
2	663	**1m**	
3	Saturday	**1m**	Accept any reasonable spelling as long as the intention is clear.
4	Letters written in order as shown:	**1m**	Letters must be in the correct order. Accept the correct number of right angles written instead of letters, eg

fewest right angles			most right angles
C	A	B	D

fewest right angles			most right angles
C	2	3	4
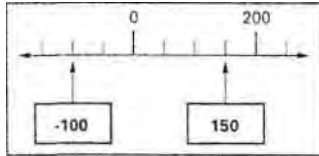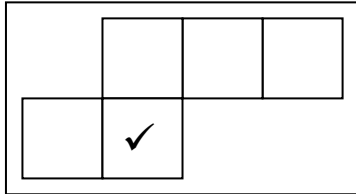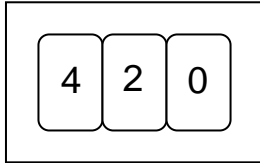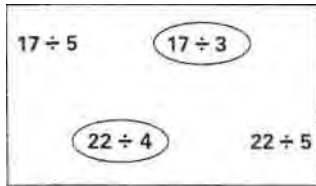
Test 5A questions 5-8

Question	Requirement	Mark	Additional guidance
5	72	1m	
6	Boxes completed as shown: ¼ ½ ¾ 1 │1¼│ 1½ │1¾│ 2	1m	**Both** numbers must be correct for the award of the mark.
7	Any 5-sided shape with straight sides using the two given sides, eg 	1m	Accept slight inaccuracies in drawing, provided the intention is clear. Accept shapes with or without shading. **Do not** accept any extension of the given lines.
8		1m	All four numbers must be correctly placed in the boxes for the award of the mark.

Test 5A questions 9-10

Question	Requirement	Mark	Additional guidance
9a	orange **and** white	**1m**	*Accept colours in either order.* *Accept any reasonable spelling of colours, providing the intention is clear.*
9b	Blue recorded in bottom left-hand region as shown:	**1m**	*Do **not** penalise answers that offer additional colours on the diagram.*

	Peter likes	Peter does not like
Stella likes	red black	orange whit
Stella does not like	purple **blue** green	yellow

Question	Requirement	Mark	Additional guidance
10	Arrow ticked as shown:	**1m**	*Accept alternative indications such as the answer underlined or circled, provided the intention is clear*

Test 5A questions 11-17

Question	Requirement	Mark	Additional guidance
11a	-100 written in the left-hand box.	**1m**	*Do not accept 100 -*
11b	150 written in the right-hand box.	**1m**	

12	Diagram marked as shown:	**1m** (U1)	*Accept alternative, unambiguous indications, such as a cross in the square shown opposite.*

13		**1m** (U1)	

14	Both divisions circled as shown:	**1m**	***Both** answers must be correct for the award of the mark.* *Accept alternative indications, such as the divisions crossed or ticked or underlined.*

15	550	**1m**	*Accept 0.5kg.*
16	3495	**1m**	
17	$^3/_8$	**1m**	*Accept equivalent fractions or decimals, eg 0.375*

Test 5A questions 18-19

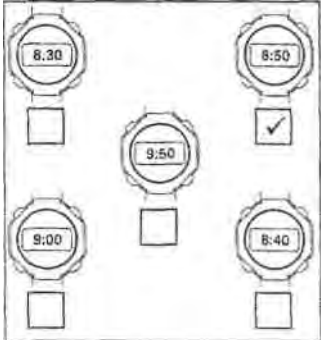| Question	Requirement	Mark	Additional guidance
18	Diagram completed as shown:	**1m**	*Accept alternative, unambiguous indications such as ticks or crosses, provided the intention is clear.*
19	Cards completed as shown:	**1m**	*Accept answers in either order.*

mirror line

mirror line

3 and 7

Test 5A questions 21-27

Question	Requirement	Mark	Additional guidance
21	Boxes completed as shown:	1m	*Accept 3.5 written once.*
22	Answers in the range 74° to 76° inclusive.	1m	
23	157	1m	
24	23	1m	
25	Award **TWO** marks for the correct answer of £74	Up to 2m	*Accept for **TWO** marks £74.00 **OR** £74.00p **OR** £74 00 **OR** £74 00p*

For question 25 continued:

If the answer is incorrect, award **ONE** mark for evidence of appropriate working which involves a complete and correct method, eg

 50p x 100 = 5000p = £50 30p x 80 = 2400p = £24 £50 + £24 = wrong answer

 OR

Award **ONE** mark for £7400p **OR** £7400 **OR** £7.40 **OR** £7.40p **OR** £740p as evidence of appropriate working.

> The 'Working mark guidance' on pages 37 and 38 shows some responses which are acceptable and unacceptable for this mark.

Additional guidance for question 25:

If both marks are awarded, record by entering 1 in each mark box.

An answer must be given for the award of ONE mark.

*If only **ONE** mark is awarded, record by entering 1, 0 in the mark boxes.*

Question	Requirement	Mark	Additional guidance
26	23	1m	
27	All four numbers correctly placed as shown:	1m	All four numbers must be placed correctly for the award of the mark. Transcription errors are acceptable only if they do not result in a wrongly ordered list.

3.3	largest
3.23	
3.2	
3.03	
3	smallest

Test 5A questions 28-31
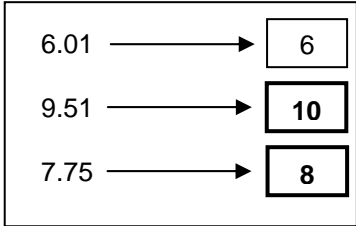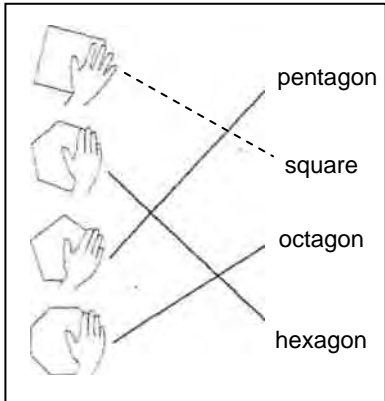
Question	Requirement	Mark	Additional guidance
28	Answer in the range 800 to 950 inclusive.	**1m**	*Accept estimates in the range 0.80l to 0.95l.*
29	Award **TWO** marks for the correct answer of 1504 If the answer is incorrect, award **ONE** mark for evidence of appropriate working which contains no. **more** than **ONE** arithmetical error, eg • Standard column algorithms, eg $$\begin{array}{r} 47 \\ \underline{\times 32} \\ 94 \\ \underline{1410} \\ \text{wrong answer} \end{array}$$ **OR** • Grid methods, eg |	40	7
---	---	---
30	1200	210
2	80	14 | 1200 + 210 + 80 + 14 = wrong answer *The 'Working mark guidance' on pages 38 and 39 shows some responses which are acceptable and unacceptable for this mark.*	**Up to 2m**	*If both marks are awarded, record by entering 1 in each mark box.* *In all cases accept follow through of **ONE** error in working.* *Do **not** award marks if:* • *the error is in the **place value,** for example the omission of the zero when multiplying by the 3 tens;* • *the final (answer) line of digits is missing.* *Variations on algorithms are acceptable, provided they represent viable and complete methods.* *An answer must be given for the award of **ONE** mark.* *If only **ONE** mark is awarded, record by entering 1, 0 in the mark boxes*
30	Answer in the range 61 to 69 inclusive.	**1m**	
31	800	**1m**	

Mark scheme for Test 5B

Test 5B questions 1-3

Question	Requirement	Mark	Additional guidance
1	Boxes completed as shown: 64 32 16 [8] 4 [2]	1m	**Both** answers must be correct for the award of the mark.
2	10	1m	
3	Ticks 8:50 as shown:	1m	*Accept any other clear way of indicating the correct time, such as crossing or circling.*
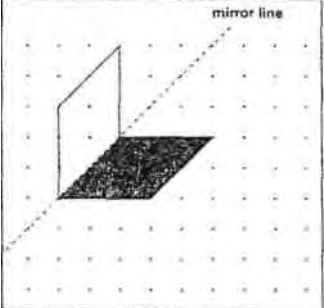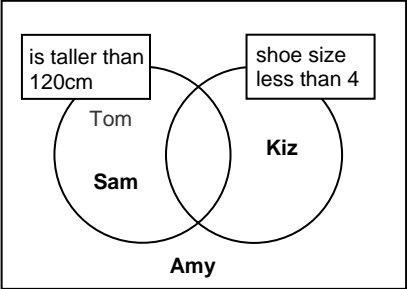
Test 5B questions 4-6

Question	Requirement	Mark	Additional guidance
4	Any two numbers which multiplied together give 150, eg 10 x 15 30 x 5 25 x 6 150 x 1 7.5 x 20	1m	
5	Boxes completed as shown:	1m	*Both* answers must be correct for the award of the mark. *Do not* accept 10.00 **OR** 10.0 **OR** 8.00 **OR** 8.0

6.01	→	6
9.51	→	**10**
7.75	→	**8**

Question	Requirement	Mark	Additional guidance
6	Matches all three shapes as shown:	1m	*All three* shapes must be matched correctly for the award of the mark. *Lines need not touch the shapes or names exactly, provided the intention is clear.*

pentagon

square

octagon

hexagon

Test 5B questions 7-11

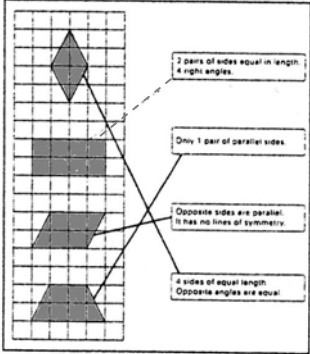| Question	Requirement	Mark	Additional guidance
7	Diagram completed as shown:	1m	
8	20	1m	
9	5.7	1m	*Accept $5\,^{7}/_{10}$ or equivalent.*
10	7	1m	
11	Award TWO marks for the correct answer of 150 If the answer is incorrect, award ONE mark for evidence of an appropriate method that involves reading both scales correctly AND identifies the correct - operation needed, eg 600 - 450 = **OR** 450 + 50 + 50 + 50 = 600 The 'Working mark guidance' on pages 40 and 41 shows some responses which are acceptable and unacceptable for this mark.	Up to 2 m	*Accept 0.15kg or equivalent.* *If both marks are awarded, record by entering 1 in each mark box.* *If only **ONE** mark is awarded, record by entering 1, 0 in the mark boxes.* *A final answer need not be written for the award of the method mark.*

Test 5B questions 12-14

Question	Requirement	Mark	Additional guidance
12	Any two numbers with a difference of 20, eg	1m	*Accept answers including fractions or decimals*

$$120 = 100 + (\boxed{45} - \boxed{25})$$

Question	Requirement	Mark	Additional guidance
13	Diagram completed as shown:	1m	*Accept slight inaccuracies in drawing, provided the intention is clear.*

Vertices must be within 2mm of the correct grid points.

The reflection need not be shaded.

Question	Requirement	Mark	Additional guidance
14	Award **TWO** marks for all three names correctly placed in the regions as shown:	**Up to 2m** (U2)	**All three** names must be correct for the award of both marks.

Do not accept a name repeated in different regions.

Accept any reasonable spelling of names, provided the intention is clear.

Do not penalise answers which offer additional names (other than those already given) on the diagram.

If both marks are awarded, record by entering 7 in each mark box.

If the answer is incorrect, award **ONE** mark for two names correctly placed.

*If only **ONE** mark is awarded, record by entering 1, 0 in the mark boxes.*

Test 5B questions 15-17

Question	Requirement	Mark	Additional guidance
15	Numbers completed as shown: 650 + [3] [5] [2] =	**1m**	*Do **not** accept digit cards used more than once.* *Answer to the calculation is not required for award of the mark.*
16	Boxes completed as shown: £8569 [ ] £9090 [✓] £9130 [ ] £8999 [✓]	**1m**	***Both** answers must be correct for the award of the mark.* *Accept alternative unambiguous indications, such as 'Yes'.* *Ignore crosses or 'No' in the other boxes, provided it is clear that the correct two prices have been chosen.*
17a	Laura **£17.10**	**1m**	*Accept £17.10p **OR** £17 10 **OR** £17 lOp **OR** 1710p written outside the box.* *Do not accept £1710 **OR** £1710p **OR** £l7.l*
17b	Carl **£10.50**	**1m**	*The above guidance on notation applies also to this mark.*
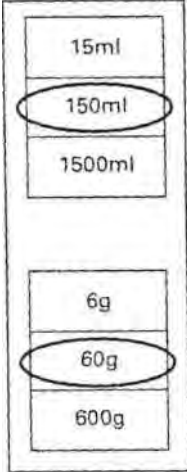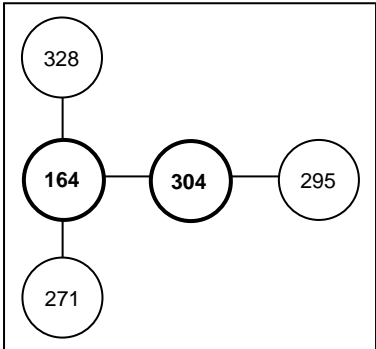
Test 5B questions 18-19

Question	Requirement	Mark	Additional guidance
18	**Three** lines drawn as shown: 	1m	*All three lines must be drawn correctly for the award of the mark.* *Lines do not have to touch the boxes or shapes exactly, provided the intention is clear.*
19	Accept an explanation which recognises that consecutive or adjoining shaded numbers have a difference of 9, eg • '*You are adding 9 each time';* • *'The numbers are going up by 9 each time';* • *'The numbers go down by 9 each time';* • *'The rule is to add 1*0 *and subtract 1 ';* • 'It is *going down one in the units and up one in the tens'.*	1m (U1)	***Do not*** *accept an explanation that is vague or arbitrary, eg* • 'The numbers get bigger'; • 'The numbers get smaller'; • 'The rule is to go down 116, 125, 134, 143'; • 'The units are going down and the tens are going up'. **Do *not*** accept: • 'The numbers are multiples of 9'.
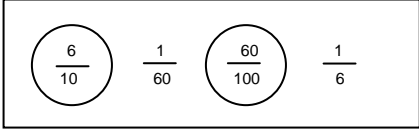
Test 5B questions 20-21

Question	Requirement	Mark	Additional guidance
20	(4, 3)	**1m**	*Coordinates must be written in the correct order.* *Accept (6, 3), (4,-1) or (6-1)*
21	Award TWO marks for the correct answer of 8 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, eg 272 + 26 = 298 298 ÷ 42 = 7.095238 answer rounded incorrectly or not rounded at all. The 'Working mark guidance' on pages 41 and 42 shows some responses which are acceptable and unacceptable for this mark.	**Up to 2m** Ⓤ1	*If both marks are awarded, record by entering I in each mark box.* *Award **ONE** mark for 7 OR for a correct calculation that has not been rounded up, eg 7.095 OR 7.095238 OR 7 rem 4* *If only **ONE** mark is awarded, record by entering 1, 0 in the mark boxes.* *A final answer need not be written for the award of the method mark.*

Test 5B questions 22-24

Question	Requirement	Mark	Additional guidance
22	Amounts circled as shown:	1m	*Both amounts must be correct for the award of the mark.* *Accept alternative unambiguous indications such as underlining or ticking.*
23	4 written in the middle row box **and** 800 written in the bottom right-hand box	1m	*Both numbers must be correct for the award of the mark.*
24	Writes 164 and 304 as shown:	1m	*Both numbers must be correct and in the correct order for the award of the mark.*

Test 5B questions 25-31

Question	Requirement	Mark	Additional guidance
25	65	**1m**	
26	107	**1m**	
27	Two fractions circled as shown:	**1m**	**Both** fractions must be indicated for the award of the mark.
			Accept any other clear way of indicating the correct fractions, such as ticking or underlining.
28	4	**1m** (U1)	
29	4.2	**1m**	
30	(3, 11)	**1m**	Coordinates must be written in the correct order.
			Accept correct answer written on the diagram, with or without brackets or commas.
31	360	**1m**	Accept 0.36kg **OR** 36kg

For question 27:

$\dfrac{6}{10}$ (circled) $\dfrac{1}{60}$ $\dfrac{60}{100}$ (circled) $\dfrac{1}{6}$

Working mark guidance

For the award of 1 mark in Test 5 A, children are required:

- to show a complete and correct method and an answer; or

- to record an answer that is accepted as evidence of a complete and correct method.

Examples of responses to question 25 in Test 5a (calculator not allowed)

Although Liam has not shown any working, we can assume from his answer of £7400p that he has used a complete and correct method, even though he made an error with the notation of the units. Liam can be awarded the mark. Daisy has calculated the cost for both the adults and the children but has not recorded a complete method since she has not totalled the two amounts. Since she has provided no evidence of her intended answer, her method is not complete. Daisy cannot be awarded the mark.

Liam

7400p

1 mark

Daisy

$100 \times 50 = 5000$

$80 \times 30 = 240$

0 marks

Anna has recognised the need to multiply 30p by 80 and 50p by 100, to find the total of these, and to convert pence to pounds and pence. She made an error in totalling the amounts but her understanding of place value was sound. Anna can be awarded the mark. Her method is complete and correct. Tarun also has recognised the need to carry out the same operations but cannot be awarded the mark since his error is in a misunderstanding of place value. He has omitted the final zero when multiplying by 50 and 30. Although his method is complete, it is not correct. Tarun cannot be awarded the mark.

Anna

$8 \times 3 = 24$
$(80 \times 30 = 2400)$
$10 \times 5 = 50$
$(100 \times 50 = 5000)$

7.20

1 mark

Tarun

$100 \times 50 = 300$ $80 \times 30 = 240$ $240 + 300 = 5.40$

5.40

0 marks

Joe's working shows evidence that he understood the steps he needed to take to find the answer. Although he made an error in calculating 8 multiplied by 3 as 22, his knowledge of place value was secure and he correctly converted pence to pounds and pence. His method is complete and correct. Joe can be awarded the mark. Kirsty's method and error in multiplying 8 by 3 are similar to Joe's but she has failed to convert the number of pence to pounds and pence. Her method is not complete or correct. Kirsty cannot be awarded the mark.

Joe — 1 mark

Kirsty — 0 marks

Examples of responses to question 29 in Test 5A (calculator not allowed)

Alice has used a conventional algorithm to find the answer. She made one error in calculating 30 multiplied by 40. However, her method is complete and correct since her error is not in her understanding of the place value, as her working shows, and she had made only one arithmetic error overall. Alice can be awarded the mark. Samantha's working, however, shows errors in the place value since she has omitted the zero when multiplying 40 by 30 and written a zero in the units column when multiplying 7 by 2. Her method is complete but not correct. Samantha cannot be awarded the mark.

Alice — 1 mark

Samantha — 0 marks

Callum and Shula have both used grid methods to show their workings. Callum's working clearly shows his understanding of place value and his ability to interpret the numbers in the grid. Although he made an error in totalling the four numbers to find his answer, his method is complete and correct. Callum can be awarded the mark. Shula's working is similar but she has made place value errors on her grid, as she has omitted the zero from 30 and 40 on the axes. Her method is complete but not correct. Shula cannot be awarded the mark.

Callum

1 mark

Shula

0 marks

Parveen has chosen to partition the numbers to assist with the multiplication. Although she made an error in the final addition, her method is complete and correct with only one arithmetic error overall. Parveen can be awarded the mark. Steve too has used partitioning but has only partially applied the method he has chosen to use. He has failed to recognise that he also needs to add the totals of 30 multiplied by 7 and 2 multiplied by 40 to 1214 to obtain the correct answer. His method is not complete or correct. Steve cannot be awarded the mark.

Parveen

1 mark

Steve
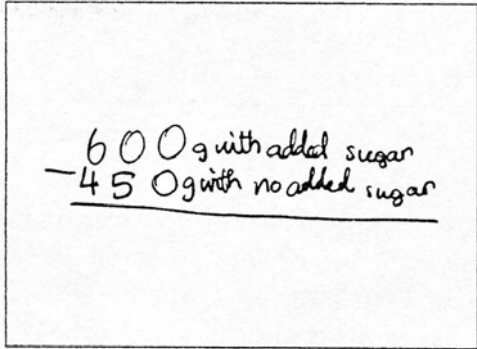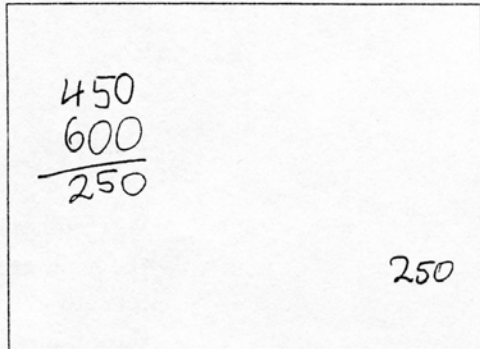
0 marks

For the award of 1 mark in Test 5B, children are required:
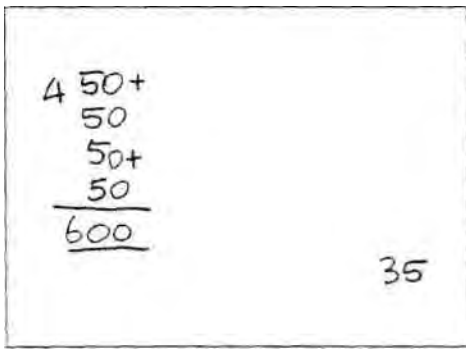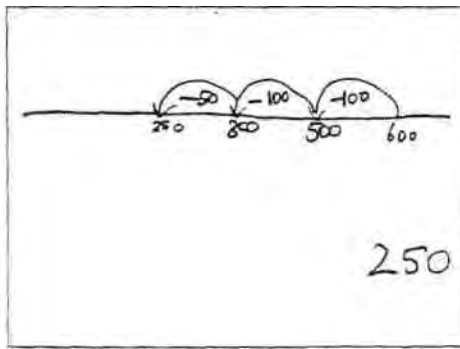
■ to show a complete and correct method (although the final answer need not be written); or

■ to record an answer that is accepted as evidence of a complete and correct method.

Examples of responses to question 11 in Test 5B (calculator allowed)

Craig has shown evidence that he has read both scales correctly and identified the correct operation to calculate the answer. Although he has not written a final answer, this is not required for the award of the mark. Craig can therefore be awarded the mark. Jane has also read the scales correctly but it is not clear from what she has written how she got to an answer of 250. Since she has not identified the correct operation, Jane cannot be awarded the mark.

Craig

$$600\text{g with added sugar}$$
$$-450\text{g with no added sugar}$$

1 mark

Jane

$$450$$
$$600$$
$$\overline{250}$$

250

0 marks

From her working, we can see that Emma has read both scales correctly. She has counted on in steps of 50 from 450 until she reached 600. Since she has read both scales correctly and identified the correct operation to find the answer, her method is appropriate, even though the answer she recorded was incorrect. Emma can be awarded the mark. Adio has used a counting back method on a self-drawn number line, but there is no evidence in his working out that he has read both scales correctly. Adio's method is not correct. Therefore, he cannot be awarded the mark.

Emma

$$450+$$
$$50$$
$$50+$$
$$50$$
$$\overline{600}$$

35

1 mark

Adio

$$-50 \quad -100 \quad -100$$
$$250 \quad 300 \quad 500 \quad 600$$

250

0 marks

Although the answer to her calculation is incorrect, Jo has shown evidence that she has read the scales accurately and identified the correct operation. Jo's method is, therefore, correct and she can be awarded the mark. Nick has also shown evidence that he has read the scales correctly, but has identified an incorrect operation by adding rather than subtracting the amounts on the two scales. Nick's method is not correct and he cannot be awarded the mark.

Jo

$600 - 450$

250

1 mark

Nick

$600 + 450$

1050

0 marks

Examples of responses to question 21 in Test 5B (calculator allowed)

Annette has used a standard pencil/paper method instead of using the calculator to divide 298 by 42. Although she has correctly completed the calculations, she has not rounded up her answer to show understanding of the context. She can be awarded one mark for identifying the correct method and calculating her answer. Jackie has correctly completed the first step of the problem in calculating the number of people to go on the trip and has identified the correct operation to solve the second step in the problem. However, she has not recorded an answer. She cannot be awarded the mark.

Annette

272
+26
298

$42\overline{)298}$ 007r4
−0
29
−0
298
−294
004   7r4

1 mark

Jackie

$272 + 26 = 298$

7

0 marks

Isaac appears to have used a trial and improvement method to find his answer but has failed to show understanding of the context in recognising that 7 coaches were not sufficient for 296 people. However, he has used an appropriate method involving a correct calculation, even though he did not round up his answer. Therefore he can be awarded the mark. Chloe appears to have counted on in groups of 42 but there is not enough evidence to suggest how she obtained her answer. Chloe's method is incomplete, and she cannot be awarded the mark.

Isaac	Chloe
212 +26 / 298 5×42 =210 6×42 =252 7×42 =294 8×42=3386 7	42+42=84 242+28=296 84+84= 168 168+84 =252 252+42=294 10
1 mark	0 marks

We can assume that Solomon has added 272 and 26 to make 298. He has then identified a correct method but has not rounded his answer of 7.09 up to 8. Therefore he can be awarded the mark for his answer of 7.09. Bradley has correctly identified that he needs to divide. However, his method is incomplete since he has not taken account of the 26 adults in his calculation. Therefore he cannot be awarded the mark.

Solomon	Bradley
$298 \div 42 =$ 7·09	$272 \div 42 = 6·47$ 6
1 mark	0 marks

Applying the mark scheme for the mental mathematics test

Please note that children will not be penalised if they record any information given in the question or show their working. Ignore any annotation, even if in the answer space, and mark only the answer. Accept an unambiguous answer written in the stimulus box or elsewhere on the answer sheet.

Full mark scheme information is given on pages 44 and 45. In addition, a 'quick reference' mark scheme is provided on pages 46 and 47. This is presented in a similar format to the children's answer sheet.

General guidance for the mental mathematics test

The general guidance for the marking of the written tests also applies to the mental test. In addition, please apply the principles below.

1. Unless otherwise stated in the mark scheme, accept answers written in words, or a combination of words and figures.

2. Where units are specified, they are given on the answer sheet. Do not penalise children for writing the units again.

3. Where answers are required to be ringed, do not accept if more than one answer is ringed, unless it is clear that the child's intended answer is the correct one. Accept also any other way of indicating the correct answer, for example underlining.

Mark scheme for the mental mathematics test

Questions 1–15

Question	Requirement		Mark	Additional guidance
1	18		1m	
2	17		1m	
3	24		1m	
4	134		1m	
5	3.15		1m	Accept $3\frac{15}{100}$ OR $3\frac{3}{20}$ OR equivalent. **Do not** accept 3 rem 1.5 **OR** 3r 1.5
6	£1.40		1m	Accept £1.40p **OR** £1 40p **OR** £1 40 **Do not** accept £140 **OR** £140p
7	40		1m	
8	61		1m	
9	600		1m	
10	5:15am — 7:15am — (5:15pm) — 7:15pm — 7:45pm		1m	Accept any other way of indicating the answer, eg crosses or ticks.
11	627		1m	
12	40		1m	
13	5		1m	
14	250		1m	
15	$\frac{3}{4}$ — $\frac{7}{10}$ — $\frac{3}{2}$ — $(\frac{6}{9})$ — $\frac{4}{5}$		1m	Accept any other way of indicating the answer, eg crosses or ticks.

Year 5 mental mathematics
quick reference mark scheme

Practice question

	16

Time: 5 seconds

1	18

2	17

3	24

4	134

5	3.15	Accept $3\frac{15}{100}$ or $3\frac{3}{20}$ or equivalent

Time: 10 seconds

6	£	1.40	Accept £1.40p or £1 40p or £1 40

7	40

8	61

9	600	g

10	5:15am 7:15am (5:15pm) 7:15pm 7:45pm

11	627

12	40	%

13	5	cm

14	250	ml

15	$\frac{3}{4}$ $\frac{3}{2}$ $\frac{7}{10}$ $\left(\frac{6}{9}\right)$ $\frac{4}{5}$

Time: 15 seconds

16	81

17	3

18	£ 2	Accept £2.00 or £2 00 or £2 00p or £2 00p

19	2009

20	9

Using the outcomes of the tests

Finding the level

Test 5A, Test 5B and the mental mathematics test will provide level outcomes ranging from level 3C to level 5B.

The levels will be calculated by adding up the marks gained from the mental mathematics test and the relevant written test, and reading across to a level in the usual way.

These tests have undergone significant pre-testing during their development. However, the volume of data gained has not been sufficient for QCA to set reliable level thresholds at this stage.

Therefore, in the summer of 2003, QCA will collect data from a number of schools from the 'live' administration of the tests and use this information to set the thresholds in the same way as the thresholds are set for the statutory tests at the end of key stage 2. The level thresholds will be available on QCA's website (www.qca.org.uk/ca/tests) from the end of May 2003 to enable teachers to calculate levels. This information will also be sent in the first week of June 2003 to all schools that have ordered the materials.

You should write these marks into the level threshold tables below when this information is available.

Test 5A, Test 5B and the mental mathematics test

Number of marks									
Level	below level 3C	level 3C	level 3B	level 3 A	level 4C	level 4B	level 4C	level 5C	level 5B

Age standardised scores for the tests will be available in the autumn term 2003.

Content analysis of the tests

The questions in the mathematics tests are aimed at a variety of aspects of the programme of study for key stage 2, including using and applying mathematics, and complement the *Framework for teaching mathematics.*

An analysis of incorrect answers and the ways in which children attempted these different types of questions could give you useful diagnostic information about the children's understanding of and ability to cope with the required mathematics. This information can help you plan future learning for the class, for groups, and for individuals. The *Year 5 mathematics test - optional grids for test analysis,* included in the *Teacher's pack,* give national curriculum references for each question, which will facilitate the analysis.

Photocopiable child's answer sheet (2 pages)

Year 5 mental mathematics test

Name .... Class ....

School ....

Total marks ☐

Practice question
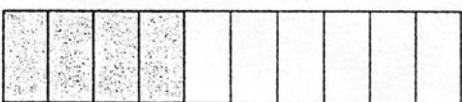
☐☐ | ☐

Time: 5 seconds

1		9	

2		83	

3		

4		67	

5		31.5	

Time: 10 seconds

6	£	£3.60	

7		5 4 2	

8		June July	

9		g	400g	

10

5:15 am   7:15 am

5:15 pm

7:15 pm   7:45 pm

11		199 428	

12

%

13		cm	40cm	

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NATIONAL CURRICULUM 5–16

GCSE

🗐 Curriculum and Standards

Audience	Year 5 teachers
Type	Assessment materials
Cross ref	Key stage 1 ARA QCA/02/934 Key stage 2 ARA QCA/02/933
Action required	Teachers of year 5 to read before assessing children with optional tests
Contact	This booklet provides information, guidance and administration of the year 5 mathematics optional tests
For school use	

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