



Guidance

Curriculum and  
Standards

## Key Stage 3

*National Strategy*

# How to get more pupils from level 3 to level 5 in mathematics – part 1

Course handbook

**Heads of mathematics**  
**Teachers of mathematics**

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# **How to get more pupils from level 3 to level 5 in mathematics – part 1**

Course handbook

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# Contents

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<b>Introduction</b>	4
<b>Session materials</b>	
1.1 2003 KS3 test results for mathematics: national data	5
1.2 Pupils' progress in mathematics from KS2 2000 to KS3 2003: national data	6
1.3 Assessment and target setting	7
1.4 Tracking pupils' progress across Key Stage 3	11
1.5 Key objectives recording sheets	13
1.6 Implications for teaching and learning	19
2.1 Mathematics intervention in Key Stage 3	20
2.2 Key Stage 3 test questions	21
<b>Slides</b>	23

# Introduction

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The training consists of two 75-minute sessions.

- Session 1 outlines an approach to using performance data to improve the tracking of pupils' progress and to inform teaching and support learning. It underpins both this training and the *Increasing pupils' rates of progress in mathematics* training in autumn 2004.
- Session 2 extends the intervention programme in mathematics for pupils in Key Stage 3 by introducing sample medium-term plans for intervention in Years 8 and 9 and resources to support these plans.

The sessions aim to:

- emphasise that intervention is fundamental to raising standards in Key Stage 3;
- support the use of data to track pupils' progress in order to help ensure that pupils' attainment is at least in line with expectations;
- build on the materials in the *Targeting level 4 in Year 7: mathematics* folder (DfES 0085-2003) to support pupils in Years 8 and 9;
- provide an overview of how existing mathematics resources can support pupils in attaining level 5 by the end of Key Stage 3.

After the course, you will be expected to:

- review pupil tracking across Key Stage 3:
  - be clear about the levels of attainment of pupils in the current Key Stage 3 cohort;
  - set targets to increase the number of pupils who progress by two levels across the key stage;
  - consider setting targets of two or three levels of improvement for gifted and talented pupils and for EAL learners at level 3 or 4 on entry;
- ensure that all pupils make progress during Key Stage 3:
  - check that measures are in place to tackle underachievement in Years 7, 8 and 9;
  - use Key Stage 3 Strategy intervention materials for Years 7, 8 and 9;
- plan how both sets of core training will be used to improve practice in the department:
  - organise departmental training to promote a shared understanding of the key messages from the training and to develop teachers' confidence and expertise in applying them in their classrooms;
  - promote collaborative working in pairs or small groups to refine planning and teaching approaches – select from the Year 8 and Year 9 intervention materials to support this work;
  - if the department is receiving additional support from a consultant, plan how this will be used to support planning, team teaching and reviewing practice;
- work with colleagues to monitor the progress of improvements, and with senior colleagues to evaluate the impact on pupils' learning, attainment and progress.

# 2003 KS3 test results for mathematics: national data

	Levels obtained								Total eligible pupils <sup>(2)</sup>	Achieving level 5 or above
	A/D	Below L3	3	4	5	6	7	8 <sup>(1)</sup>		
Boys	4	3	8	16	21	25	19	5	100	70
Girls	3	3	7	16	22	27	19	4	100	72
All	4	3	7	16	22	26	19	5	100	71

## Key

The table shows percentages. Figures are rounded and may not total 100%.

A represents pupils who were absent.

D represents pupils who have been disapplied under Section 364/365 of the Education Act.

## Notes

(1) Level 8 can only be achieved in mathematics following the end of extension papers at Key Stage 3.

(2) Number of pupils with valid results at Key Stage 3, in all schools. This excludes any missing results.

# Pupils' progress in mathematics from KS2 2000 to KS3 2003: national data

KS2 level	Percentage achieving KS3 level											L5+
	D	B	N	2	3	4	5	6	7	8	Total	
D	26	22	10	4	20	8	2	1	0	0	100	4
B	5	19	14	7	36	9	1	0	0	0	100	1
N	1	2	12	8	59	10	0	0	0	0	100	1
2	0	0	3	4	59	25	1	0	0	0	100	1
3	0	0	1	0	18	48	24	3	0	0	100	27
4	0	0	0	0	1	10	33	42	11	0	100	87
5	0	0	0	0	0	0	2	22	56	18	100	99
6	0	0	0	0	0	0	0	1	10	88	100	99
L4+	0	0	0	0	1	6	23	35	26	7	100	91

## Key

The table shows percentages. Figures are rounded and may not total 100%.

**0** represents some pupils but less than 0.5%.

**D** represents pupils who have been disapplied under Section 364/365 of the Education Act.

**B** represents pupils who were assessed by teacher assessment only.

**N** represents pupils who took the test but failed to gain sufficient marks to register a level.

**L4+** represents level 4 and above.

**L5+** represents level 5 and above.

## Notes

96% of pupils with a valid result in mathematics at Key Stage 3 also have a valid result in mathematics at Key Stage 2. Valid results in Key Stage 3 mathematics include levels 2–8, D, B, N and A. Valid results in Key Stage 2 mathematics include levels 2–6, D, B, N and A.

## SOURCE

*Framework for teaching mathematics: Years 7, 8 and 9, section 1, pages 39–43.*

As pupils come to terms with their new school, it is essential to continue to build their mathematical skills. Year 7 teachers need to know what their pupils can already do. Many pupils now leave Year 6 with personal targets, records and a history of intervention. This body of information can help secondary teachers to make a quick start on work that is well matched to pupils' capabilities. The 'clean-sheet' approach is too slow, and allows pupils to coast or fall back when they need to be challenged. As a minimum, teachers of Year 7 classes should survey the information available to them about the mathematical attainment of incoming pupils to help plan in advance the work of the first term, and then review individual records more closely when staff have had three or four weeks of experience with individual pupils. This alerts staff to unexpected changes in performance which need to be resolved and enables them to adjust teaching expectations accordingly.

Priorities for each new cohort can be derived from Key Stage 2 levels and raw scores, and the qualitative information provided by work sampling and other monitoring in the early part of Year 7. This helps the department to translate wider ambitions such as 'improve number skills' first into numerical targets such as 'increase by 5% the proportion of pupils achieving level 4 in number and algebra by the end of Year 7', then into specific curricular targets such as 'all pupils will recognise the equivalence of simple fractions, decimals and percentages' or 'all pupils will use the order of operations, and know that algebraic operations follow the same conventions and order as arithmetic operations'.

Assessment, recording and reporting are important elements of teaching but they have to be manageable if the information they yield is to be useful. The best assessment has an immediate impact on teaching, because it alerts you to the needs of pupils who are either out of step or exceeding expectations. Assessment should help to maintain the pace of learning for all pupils by informing teaching plans, in a continuous cycle of planning, teaching and assessment.

It is useful to consider assessment at three connected levels: short-term, medium-term and long-term.

### Short-term assessments

Short-term assessments are an informal part of every lesson. Their purposes are to:

- check that pupils are developing mental skills: for example, that they can recall mathematical facts, estimate, calculate mentally, and use visual imagery;
- check that pupils have grasped the main teaching points in a particular lesson or unit of work, whether they have any misunderstandings that you need to put right, and whether they are ready to move on;
- give you information which will help you to adjust day-to-day lesson plans and brief any support staff about which pupils to assist, and how to assist them.

For these short-term assessments what you assess will be matched closely to your teaching objectives. There are three main ways to make them.

- **During every lesson** you absorb and react to pupils' responses, see whether pupils are confident or hesitant with new work, decide whether they need extension work or more help, and offer immediate support. Where you notice any difficulties or misunderstandings, you adjust your lesson and address them straight away, if necessary continuing in the next lesson or two. In this way, pupils can keep up with the pace of work and do not fall behind. In the plenary, you can acknowledge

individual and class achievement and effort and remind pupils about their targets. The plenary is also a good time to firm up short-term assessments by asking probing questions to judge how well pupils have understood new work and to check again for any misconceptions.

- **At intervals** you will supplement your day-to-day observations. For example, a homework task or an occasional short informal test can give you useful information on who has learned what and who needs extra support.
- **Marking** of pupils' work will be followed immediately by discussion with the class to give pupils feedback on their performance and what they need to do to improve. At the same time you can make sure that any errors are put right and the merits of different methods or approaches discussed.

Short-term assessments don't need to be recorded, since they are for immediate action and attention. Some teachers note briefly when a pupil surprises them, perhaps with his or her knowledge, or with something that is unexpectedly difficult. These informal, personal recordings can help to clarify patterns in performance over time or responses to specific teaching or support.

## Medium-term assessments

Medium-term assessments should gather new information, not just confirm what you already know. They are mainly to:

- review and record pupils' progress over the previous half-term or term in relation to key objectives, what they know and can do, whether they can apply their skills in a new context, and whether they still have any difficulties;
- identify pupils' progress against specific individual targets, including those in IEPs, so you can give pupils feedback and set new targets;
- help you to plan work of the next half-term or so;
- give you information to feed into end-of-term or end-of-year assessments.

Most pupils should be living up to expectations for their class and you will be familiar with their progress and learning from your short-term assessments. Medium-term assessments should centre on the most important aspects of the mathematics you have taught and help you to identify pupils' particular strengths and weaknesses. They should be related particularly to the **key objectives** that you have focused on in the half-term's work [for details of key objectives, see section 1.5 of this course handbook]. These objectives are central to all pupils' progress in relation to the National Curriculum level descriptions, and hence to their performance in tests and teacher assessments.

Medium-term assessments are best timed to influence planning. At intervals, perhaps at the end of a half-termly block of several units of work, there is an obvious opportunity to assess how well pupils have done against the relevant key objectives, and to set targets for the future. This may mean, for example, a review of work completed in the units, a substantial assignment, a test, or an assessment of oral and mental skills. Choose tasks that pupils can tackle independently so that you can concentrate on the pupils you are unsure about. The results need not be elaborate: if the units have gone well, it may just be a matter of identifying which pupils need extra feedback or consolidation, and setting new targets for the whole group. It may, on the other hand, suggest certain targets for particular groups and individuals. Some of these targets will take pupils on to new objectives, and others will ensure that insecure learning is consolidated. The principle is to mobilise assessments quickly into the setting of relevant and realistic targets.

## Marking

Marking of tests or assessment tasks should usually be followed by giving pupils feedback on what they have achieved and how to improve their work. You will probably want pupils to make corrections, so constructive written comments are more helpful than grades and ticks and crosses. Marking, feedback, corrections and rectifications of difficulties are best done immediately so that pupils can still remember how they approached the task and so that you can modify your teaching plans if you need to.

## Recording

Pupils' progress towards the key objectives needs to be recorded. Since there are relatively few key objectives for each year, records are not too onerous to maintain, and updating them every six weeks or so is sufficient. The easiest system is a **class record of the key objectives** [as shown in section 1.5 of this handbook].

Your class record can be updated when you feel confident that a pupil has achieved a key objective. This is a sufficient record of most pupils' progress but you will probably need some supplementary notes for the few individuals whose progress towards the key objectives differs markedly from the majority of their peers. A class record of this kind can be a useful aide-mémoire for parents' evenings or when you are writing annual reports.

## Individual targets for pupils

A discussion with pupils during the course of each half-term to set them personal targets helps them to achieve the key objectives over the medium term. You may want to arrange your discussion with some pupils on an individual basis – for example, pupils with special needs whose IEPs need updating, or pupils who would benefit from a degree of privacy – but for most of them you can organise the discussion in small groups as part of an ordinary mathematics lesson. Ask pupils to suggest two or three improvements to work on over the next term. You could also offer pupils some practical advice on the steps they might take to achieve their targets, and give them an additional opportunity to work on the targets as part of one or more homework tasks. It is helpful if some monitoring of progress towards individual pupils' mathematics targets can take place in tutor-group time as part of a whole-school approach to target setting.

Individual targets will usually be linked to the key objectives that you will focus your teaching on over the next few weeks. They may be very specific: for example, to become proficient at adding and subtracting a pair of fractions. For some pupils a target may need to be broken down into stages: for example, to learn to add a pair of unit fractions. For others, it may be appropriate to choose a target linked to the key objectives for the year group below or above. Whatever the targets, they need to be straightforward and not too many at one time, so that pupils understand and can manage them.

You can note the targets you set for individual pupils by highlighting the particular boxes on a class record of key objectives. Exceptionally, there may be some pupils with special needs whose personal targets need to be recorded in your supplementary notes or their IEP.

## Long-term assessments

At particular times, and especially towards the end of the school year, you will assess and review pupils' progress and attainment against school and national targets, drawing on your class record of key objectives and supplementary notes.

Long-term assessments are also important in Years 7 and 8, not just at the end of Year 9. Their purposes are to:

- assess pupils' work against the key objectives for the year;
- at the end of Year 9, assess pupils' work against national standards;
- give you supplementary information about individual pupils' attainment and progress so that you can report to parents and, if appropriate, the next teacher;
- help the school to set targets for mathematics for future years;
- allow the headteacher to brief governors and others on progress and attainment in Key Stage 3, including progress towards school, LEA and national targets.

Long-term assessments include end-of-year tests or examinations, and teacher assessments.

- The compulsory National Curriculum mathematics tests for Year 9 can be supplemented by the optional tests for Years 7 and 8 provided by QCA. The test scores will help you to monitor whether pupils individually and collectively are attaining at, below or above 'national expectations', and how their attainment compares with their previous attainment. Results expressed as National Curriculum levels help you to judge overall standards and progress towards school, LEA and national targets. Each year QCA publishes a *Standards Report* for Key Stage 3, analysing pupils' performance on the Year 9 tests. These reports also help to identify particular weaknesses which you may need to tackle in your next phase of teaching.
- You will also make a teacher assessment to sum up your judgement of pupils' attainment. For Year 9, this statutory end-of-year assessment will be against the National Curriculum level descriptions. The cumulative picture that you carry in your head of the progress of each pupil can be extended and secured by looking through samples of pupils' work. At the same time, you can update and complete class records of key objectives, and any supplementary notes you have made.

Before end-of-key-stage teacher assessments are made, it is helpful if all staff teaching mathematics in Key Stage 3 examine together a sample of pupils' work from each class. A moderation exercise helps to make sure that judgements against the National Curriculum level descriptions are consistent through the department. The exercise could also be extended to Year 7 and Year 8 to establish clear expectations against the key objectives.

## Tracking pupils' progress across Key Stage 3

Sources of data and actions to support the tracking of pupils' progress within each year of Key Stage 3 are listed overleaf.

Reflect on your own system for tracking pupils' progress and identify for each of the sources of data whether these are currently, partly or not in place.

Identify for each data source:

- who has this information;
- who needs the information and when.

In pairs describe *how* the information is used.

Note key points and be prepared to give feedback on one point in the areas you feel your department is:

- more secure;
- less secure.

What could be done to improve the management of data within your department?

Write down three points for action in relation to improving the management of data within your department during 2004/05. What assistance, within school or from the LEA, is needed to support this task?

**Note:** From 2004, PAT will incorporate the QCA diagnostic software, enabling question-level analysis of National Curriculum and optional tests.

Tracking pupils' progress	In place: fully/ partly/not	Who has this information?	Who needs to know?	When will this happen?
<p><b>End of Key Stage 2</b></p> <p>KS2 test levels</p> <p>KS2 test raw scores (to inform groups/sets)</p> <p>KS2 teacher assessment and comments</p> <p>Item analysis of KS2 tests</p> <p>Record of attainment based on key objectives</p>				
<p><b>Year 7</b></p> <p>Pupil data used to set initial end-of-KS3 targets</p> <p>Individual pupil curricular targets set (based on KS2 information)</p> <p>Pupils' curricular targets periodically reviewed</p> <p>Record of attainment based on key objectives updated</p> <p>Outcomes from QCA progress test and optional tests reviewed</p> <p>Item analysis of optional/progress tests</p> <p>Pupils' progress against targets checked and amended as appropriate</p>				
<p><b>Year 8</b></p> <p>Pupil data used to amend end-of-KS3 targets</p> <p>Individual pupil curricular targets set (based on Y7 information)</p> <p>Statutory whole-school targets set</p> <p>Pupils' curricular targets periodically reviewed</p> <p>Record of attainment based on key objectives updated</p> <p>Outcomes from QCA optional tests reviewed</p> <p>Item analysis of optional tests</p> <p>Pupils' progress against targets checked and amended as appropriate (short term and end of key stage)</p> <p>Individual pupils' short- and long-term targets agreed</p>				
<p><b>Year 9</b></p> <p>Pupil data used to check end-of-KS3 targets</p> <p>Individual pupil curricular targets set (based on Y8 information)</p> <p>Pupils' curricular targets periodically reviewed</p> <p>Record of attainment based on key objectives updated</p> <p>Analysis of KS3 results</p> <p>Item analysis of KS3 tests</p> <p>Pupils' progress against targets checked</p>				

## Key objectives recording sheets

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Pupils' progress towards the key objectives needs to be recorded. Since there are relatively few key objectives for each year, records are not too onerous to maintain, and updating them every six weeks or so is sufficient. The easiest system is a **class record of the key objectives** as shown in this section.

The following recording sheets list the key objectives for Years 5, 6, 7, 8 and 9. Word versions of the forms are available on the Standards website, [www.standards.dfes.gov.uk](http://www.standards.dfes.gov.uk). The forms for Years 7, 8 and 9 are on the Key Stage 3 mathematics site, while those for Years 5 and 6 are on the Primary site.

**Key objectives: Year 5  
(mainly level 4)**

	Class																				
Multiply and divide any positive integer up to 10 000 by 10 or 100 and understand the effect.	<input type="checkbox"/>																				
Order a given set of positive and negative integers.	<input type="checkbox"/>																				
Use decimal notation for tenths and hundredths.	<input type="checkbox"/>																				
Round a number with one or two decimal places to the nearest integer.	<input type="checkbox"/>																				
Relate fractions to division and to their decimal representations.	<input type="checkbox"/>																				
Calculate mentally a difference such as 8006 – 2993.	<input type="checkbox"/>																				
Carry out column addition and subtraction of positive integers less than 10 000.	<input type="checkbox"/>																				
Know by heart all multiplication facts up to $10 \times 10$ .	<input type="checkbox"/>																				
Carry out short multiplication and division of a three-digit by a single-digit integer.	<input type="checkbox"/>																				
Carry out long multiplication of a two-digit by a two-digit integer.	<input type="checkbox"/>																				
Understand area measured in square centimetres (cm <sup>2</sup> ); understand and use the formula in words 'length $\times$ breadth' for the area of a rectangle.	<input type="checkbox"/>																				
Recognise parallel and perpendicular lines, and properties of rectangles.	<input type="checkbox"/>																				
Use all four operations to solve simple word problems involving numbers and quantities, including time, explaining methods and reasoning.	<input type="checkbox"/>																				

**National Strategy  
Mathematics**

**Key objectives: Year 6**  
(consolidate level 4; start level 5)

	Class																												
Multiply and divide decimals mentally by 10 or 100, and integers by 1000, and explain the effect.	<input type="checkbox"/>																												
Order a mixed set of numbers with up to three decimal places.	<input type="checkbox"/>																												
Reduce a fraction to its simplest form by cancelling common factors.	<input type="checkbox"/>																												
Use a fraction as an operator to find fractions of numbers or quantities (e.g. $\frac{3}{8}$ of 32, $\frac{7}{10}$ of 40, $\frac{9}{100}$ of 400 centimetres).	<input type="checkbox"/>																												
Understand percentage as the number of parts in every 100, and find simple percentages of small whole-number quantities.	<input type="checkbox"/>																												
Solve simple problems involving ratio and proportion.	<input type="checkbox"/>																												
Carry out column addition and subtraction of numbers involving decimals.	<input type="checkbox"/>																												
Derive quickly division facts corresponding to multiplication tables up to $10 \times 10$ .	<input type="checkbox"/>																												
Carry out short multiplication and division of numbers involving decimals.	<input type="checkbox"/>																												
Carry out long multiplication of a three-digit by a two-digit integer.	<input type="checkbox"/>																												
Use a protractor to measure acute and obtuse angles to the nearest degree.	<input type="checkbox"/>																												
Calculate the perimeter and area of simple compound shapes that can be split into rectangles.	<input type="checkbox"/>																												
Read and plot coordinates in all four quadrants.	<input type="checkbox"/>																												
Identify and use the appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities, and explain methods and reasoning.	<input type="checkbox"/>																												
Solve a problem by extracting and interpreting information presented in tables, graphs and charts.	<input type="checkbox"/>																												

**Key objectives: Year 7**  
(reinforce level 4; continue level 5)

	Class																				
Simplify fractions by cancelling all common factors; identify equivalent fractions.	<input type="checkbox"/>																				
Recognise the equivalence of percentages, fractions and decimals.	<input type="checkbox"/>																				
Extend mental methods of calculation to include decimals, fractions and percentages.	<input type="checkbox"/>																				
Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers.	<input type="checkbox"/>																				
Break a complex calculation into simpler steps, choosing and using appropriate and efficient operations and methods.	<input type="checkbox"/>																				
Check a result by considering whether it is of the right order of magnitude.	<input type="checkbox"/>																				
Use letter symbols to represent unknown numbers or variables.	<input type="checkbox"/>																				
Know and use the order of operations and understand that algebraic operations follow the same conventions and order as arithmetic operations.	<input type="checkbox"/>																				
Plot the graphs of simple linear functions.	<input type="checkbox"/>																				
Identify parallel and perpendicular lines; know the sum of angles at a point, on a straight line and in a triangle.	<input type="checkbox"/>																				
Convert one metric unit to another (e.g. grams to kilograms); read and interpret scales on a range of measuring instruments.	<input type="checkbox"/>																				
Compare two simple distributions using the range and one of the mode, median or mean.	<input type="checkbox"/>																				
Understand and use the probability scale from 0 to 1; find and justify probabilities based on equally likely outcomes in simple contexts.	<input type="checkbox"/>																				
Solve word problems and investigate in a range of contexts, explaining and justifying methods and conclusions.	<input type="checkbox"/>																				



**Key objectives: Year 9  
(mainly level 6)**

	Class																				
Add, subtract, multiply and divide fractions.	<input type="checkbox"/>																				
Use proportional reasoning to solve a problem, choosing the correct numbers to take as 100%, or as a whole.	<input type="checkbox"/>																				
Make and justify estimates and approximations of calculations.	<input type="checkbox"/>																				
Construct and solve linear equations with integer coefficients, using an appropriate method.	<input type="checkbox"/>																				
Generate terms of a sequence using term-to-term and position-to-term definitions of the sequence, on paper and using ICT; write an expression to describe the $n$ th term of an arithmetic sequence.	<input type="checkbox"/>																				
Given values for $m$ and $c$ , find the gradient of lines given by equations of the form $y = mx + c$ .	<input type="checkbox"/>																				
Construct functions arising from real-life problems and plot their corresponding graphs; interpret graphs arising from real situations.	<input type="checkbox"/>																				
Solve geometrical problems using properties of angles, of parallel and intersecting lines, and of triangles and other polygons.	<input type="checkbox"/>																				
Know that translations, rotations and reflections preserve length and angle and map objects on to congruent images.	<input type="checkbox"/>																				
Know and use the formulae for the circumference and area of a circle.	<input type="checkbox"/>																				
Design a survey or experiment to capture the necessary data from one or more sources; determine the sample size and degree of accuracy needed; design, trial and if necessary refine data collection sheets.	<input type="checkbox"/>																				
Communicate interpretations and results of a statistical enquiry using selected tables, graphs and diagrams in support.	<input type="checkbox"/>																				
Know that the sum of probabilities of all mutually exclusive outcomes is 1 and use this when solving problems.	<input type="checkbox"/>																				
Solve substantial problems by breaking them into simpler tasks, using a range of efficient techniques, methods and resources, including ICT; give solutions to an appropriate degree of accuracy.	<input type="checkbox"/>																				
Present a concise, reasoned argument, using symbols, diagrams, graphs and related explanatory text.	<input type="checkbox"/>																				

## Implications for teaching and learning

Paying regular attention to the following points will help you in your teaching and pupils in their learning.

- Use direct interactive teaching to emphasise specific aspects of mathematics.
- Engage pupils in discussion. Encourage them to articulate and describe the methods and reasoning that they use and to compare these with the ideas of others.
- Ensure that pupils understand and use vocabulary correctly, particularly subject-specific vocabulary. Study the vocabulary and make sure that all pupils can read and write these words correctly.
- Give pupils practice at interpreting questions by focusing on both the subject vocabulary and the language typically used in test questions.
- Use errors from previous work as key teaching points. This technique is the key to assessing what pupils know, and to planning subsequent work to move learning forward and raise standards. Talk about common errors with pupils. Avoid re-teaching work in the same way.
- At the end of each lesson, stress the main learning points and assess pupils' progress informally.
- Work with pupils to sort out misconceptions and identify progress, to summarise key facts and ideas and what needs to be remembered. Give pupils strategies to help them remember key facts. Discuss the next steps and set regular work for pupils to do at home.
- Make sure that pupils check their work.

Throughout the year, you should:

- give pupils practice at working a variety of questions from previous Key Stage 3 tests;
- ask pupils which topics they feel most confident about and which topics they feel least confident about and practise the latter;
- give pupils regular practice in completing work within a restricted period of time.

Source: *Year 9 booster kit: mathematics* (DfES 0015/2002)

# Mathematics intervention in Key Stage 3

## DfES 0085/2003 **Targeting level 4 in Year 7: mathematics folder and consolidation lessons**

These are essentially revision lessons – pupils will have met the topics before. You could choose to use the lessons during the latter half of the year as a lesson to complete a topic or you could choose to use them in the early summer term before the Year 7 progress test.

DfES 0142/2003  
number and algebra

## **Year 7 intervention plan and level 3 to level 4 lessons**

DfES 0291/2003  
shape, space, measures  
and handling data

The intervention plan is closely linked to the original Year 7 sample medium-term plan for mathematics (DfEE 0504/2001). This plan builds in key elements of the Key Stage 2 programme of study leading into the Year 7 yearly teaching programme. It illustrates where other materials can be incorporated.

The level 3 to level 4 lessons are core lessons to be used during Year 7. They give teachers guidance on teaching key topics necessary for pupils to attain level 4 in mathematics. They use *Springboard 7* as a resource and have been organised to match the intervention plan.

DfES 0200/2003  
one pack per school  
containing three  
sets of materials

## **Mathematics challenge pack (one-to-one support materials)**

These materials support schools in recruiting, training and organising parents, mentors and volunteers who will coach pupils in aspects of mathematics. Initially targeted at Year 7 pupils, they can be used in Year 8 and Year 9 as appropriate. As part of a planned programme of intervention these are best used in advance of a topic being met in the teaching programme. Pupils will then be in a better position to benefit from the lessons.

DfES 0292-2004  
two folders per  
school at training,  
a further three folders  
available to order

## **From level 4 to level 5 in mathematics: Year 8 intervention**

These materials are closely linked to the original Year 8 sample medium-term plan for mathematics (DfEE 0504/2001). This plan builds in key elements of the Year 7 yearly teaching programme and links these to relevant materials.

DfES 0293-2004  
two folders per school  
at training, a further  
three folders  
available to order

## **Securing level 5 in mathematics: Year 9 intervention**

These materials are closely linked to the original Year 9 sample medium-term plan for mathematics (DfEE 0504/2001). This plan builds in key elements of the Year 8 yearly teaching programme and links these to relevant materials.

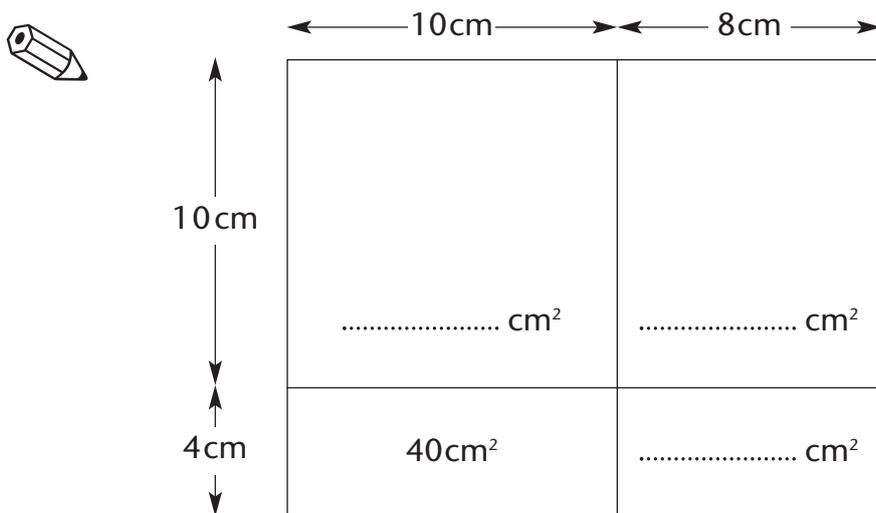
## Areas

The diagram shows a rectangle **18 cm** long and **14 cm** wide.

It has been split into **four smaller rectangles**.

Write the **area** of each **small rectangle** on the diagram.

One has been done for you.



1 mark

What is the area of the **whole** rectangle?



..... cm<sup>2</sup>

1 mark

What is **18 × 14**?



18 × 14 = .....

1 mark

Total 3 marks

## Marbles

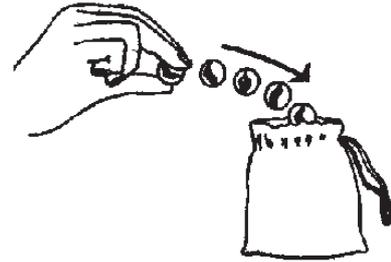
- (a) Elin has a bag of marbles.

You cannot see how many marbles are inside the bag.

Call the number of marbles which Elin starts with in her bag  $n$ .

Elin puts **5 more** marbles **into** her bag.

Write an expression to show the total number of marbles in Elin's bag now.



1 mark



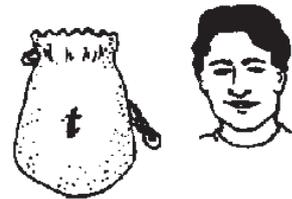
.....

- (b) Ravi has another bag of marbles.

Call the number of marbles which Ravi starts with in his bag  $t$ .

Ravi takes **2** marbles **out** of his bag.

Write an expression to show the total number of marbles in Ravi's bag now.



1 mark



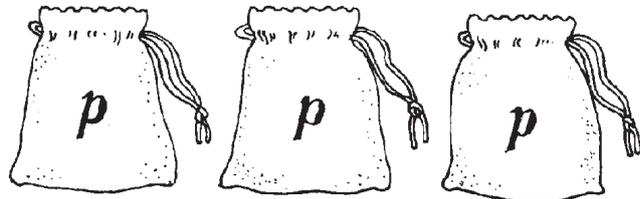
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- (c) Jill has **3** bags of marbles.

Each bag has  $p$  marbles inside.

Jill takes some marbles out.

Now the total number of marbles in Jill's 3 bags is  $3p - 6$



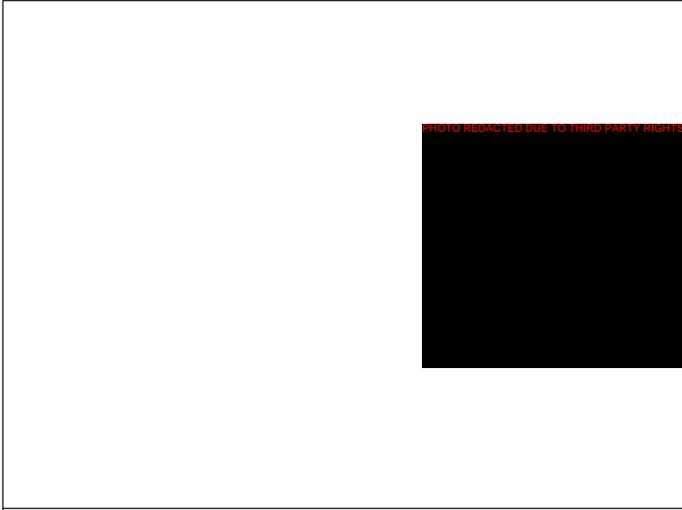
**Some** of the statements below **could** be true.

Put a tick (✓) by each statement which **could** be true.



Jill took <b>2</b> marbles out of <b>one</b> of the bags, and <b>none</b> out of the other bags.	
Jill took <b>2</b> marbles out of <b>each</b> of the bags.	
Jill took <b>3</b> marbles out of <b>one</b> of the bags, and <b>none</b> out of the other bags.	
Jill took <b>3</b> marbles out of each of <b>two</b> of the bags, and <b>none</b> out of the other bag.	
Jill took <b>6</b> marbles out of <b>one</b> of the bags, and <b>none</b> out of the other bags.	
Jill took <b>6</b> marbles out of each of <b>two</b> of the bags, and <b>none</b> out of the other bag.	

2 marks

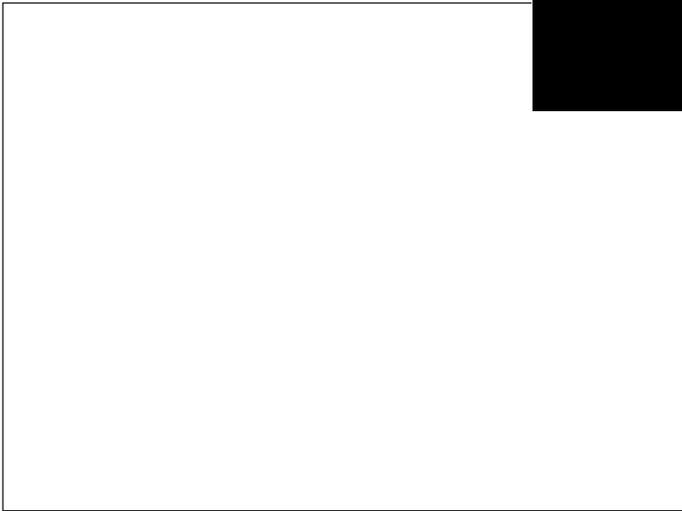


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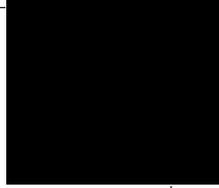
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PHOTO REDACTED DUE TO THIRD PARTY



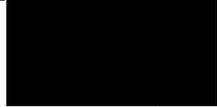
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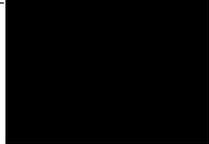
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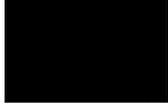
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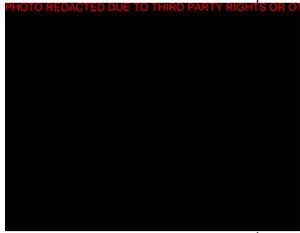
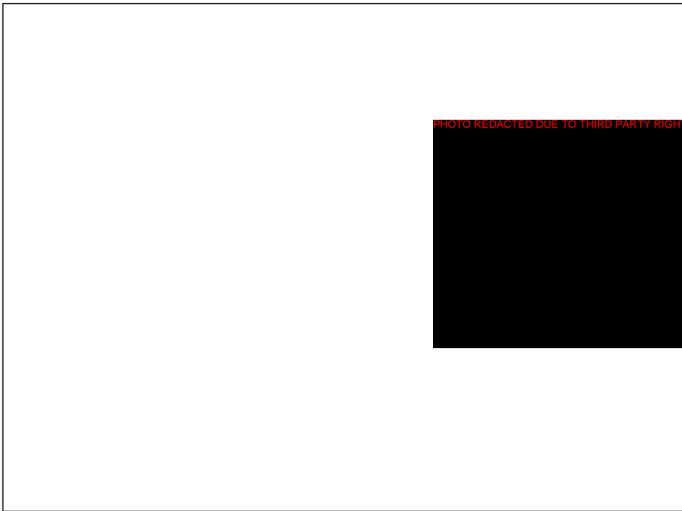


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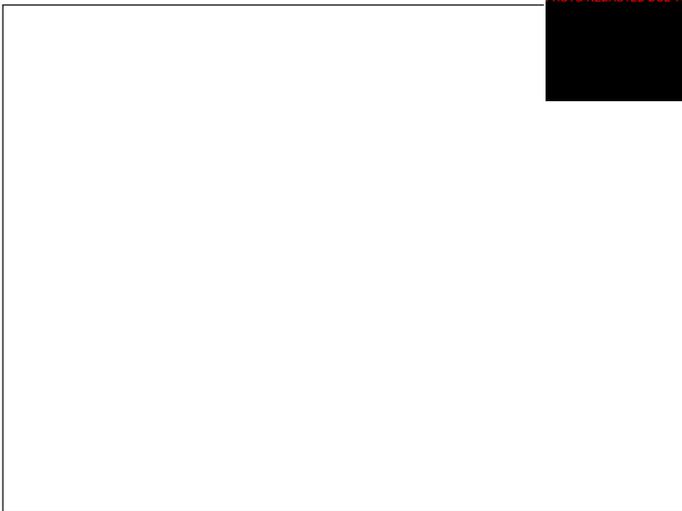


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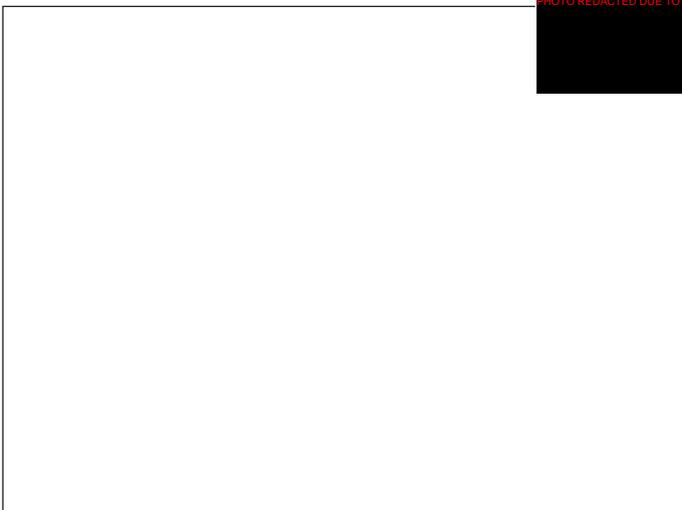


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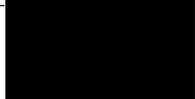
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2.3–2.4

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