

# The National Strategies' Programmes of Support for the National Challenge

## **National Challenge Core Plus mathematics programme**

Element 1b: Leading improvement and raising  
standards in the mathematics department  
Pivotal pupils in Year 11

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#### Rationale

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The Year 11 cohort will contain pupils who have a good chance of achieving a grade C at GCSE but who may not do so without swift, responsive action. This situation could be a result of:

- the teaching of particular groups that has not helped them to make the progress required by the end of Year 10. These groups have lost momentum
- the response of groups of pupils who have become de-motivated with their experience of mathematics and disappointed with their progress in the subject. These pupils have lost confidence
- the poor test and examination performance of individual pupils resulting in them moving groups. This 'moving down' means that the learning is well within their comfort zone. These pupils are no longer challenged
- the poor record of attendance of individual pupils; for example, a significant long-term absence or short but frequent absences. These pupils have missed essential teaching and have significant curricular gaps
- the decisions concerning tiers of entry, modular/linear examinations, early entry and re-sit policy, which have not suited the needs of all pupils. Some pupils are not provided with the best possible chance to show what they can do.

The aims of the suggested approach are to support mathematics departments in:

- making effective use of the additional teaching time provided by the removal of coursework requirements so that progress towards grade C is accelerated
- strengthening key areas of weakness in aspects of mathematics which impact on grade C attainment
- supporting pupils' learning and motivation in relation to mathematics, and developing their capacity to take responsibility for their own progress
- having a positive impact on pupils' views of themselves as learners capable of success in mathematics.

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#### Quality standards

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A tactical approach to teaching and learning for Year 11 requires the same planning and pedagogical principles as those described in Core Plus mathematics Elements 2 to 6. The features below represent additional elements or adjustments which are needed to build confidence in the run up to the final examination.

- 'Fine tuning' planning and teaching to focus more closely on the exact requirements of grade C. This will be evident by:
  - teachers using strategies to support ongoing assessment against grade C criteria in everyday lessons to build pupils' confidence to achieve at that grade

- teachers and subject leaders (SLs) using the evidence generated from these strategies to pinpoint aspects of the curriculum which require further work
- teachers planning sequences of lessons to address these aspects of the curriculum in ways which tackle misconceptions and address curriculum gaps, including through small group work
- SLs ensuring that well informed ongoing assessment drives strategic intervention.
- Rethinking teaching approaches to tackle misconceptions, using different activities and new teaching strategies so that understanding is improved and the experience is memorable.
- Developing varied and engaging approaches to examination preparation and revision. Modelling revision strategies so that pupils are able to use them independently beyond the classroom. Practising questions and examination techniques so that pupils are involved in discussions about the mathematics, the question structure, techniques for starting, solving and checking solutions and ways of maximising marks.

## Exemplification

Actions for the mathematics department

Related leadership and support, senior leadership team (SLT), SL, key teacher, advanced skills teacher (AST), consultant

**Autumn term: a solution-focused approach**

Evaluate whether the Year 10 exam(s) accurately reflect progress towards GCSE assessment criteria. If not, then urgently re-design and re-assess.

Collate and analyse teacher assessment and examination results:

- Use pivot tables of Year 10 attainment set against Key Stage 2 and Key Stage 3 mathematics attainment to establish conversion rates and identify groups of pupils needing support to reach grade C.
- Use teacher assessment and exam item analysis to establish common curricular priorities for those pupils, see Help sheet 3: *HS3: Carrying out a script analysis*.
- Agree groupings for pupils so that an appropriate level of challenge is set and pupils have the best chance possible of target grades.

Draw up a time line of critical dates based on decisions driven by examination entry requirements. See Help sheet 2, *HS2: Points to consider – examination entry*. Include dates for strategic meetings so that decisions can be discussed between SL, consultant and school senior leader; for example, to consider policy of examination entry to allow target pupils the best chance of success.

Review and amend the target group to take account of performance in other subjects. (Use the Venn analysis tool – see RAP management guide and Element 6 of Stronger Management Systems)

Ensure that pupils remain in agreed teaching groups, supported through strategies to address curricular gaps and build confidence. If this needs development, see Core Plus Element 5: Intervention and personalisation in mathematics.

Ensure that regular planning and teaching addresses identified curricular priorities rather than the 'routine coverage' of the syllabus (this is Wave 1 intervention). Make sure that this involves:

- planned lesson sequences (not separate lessons), drawing out the interconnections in mathematics
- teaching for understanding, not just 'mopping up' small skills presented as discrete 'rule driven' items to be memorised
- engaging collaborative tasks to improve the way pupils access and tackle exam-style questions See Help sheet 4: *HS4: Creative ideas for examination question practice*
- regular feedback to pupils about specific progress they have made and the next steps they need to make.

Agree roles and responsibilities for departmental support for small groups and individuals requiring additional focused support for specific areas in the curriculum (this is Wave 2 and Wave 3 intervention).

Discuss and decide on creative ways of facilitating intervention taking account of the numbers of pupils involved, the staffing level and expertise in the department and the underlying issues in the school. Ideas could include:

- teachers 'specialising' by planning one or two critical units and teaching these in rotation to a few groups. Continuity of contact with the pupils and strategies for behaviour for learning provided by a strategic team (other staff such as senior leaders, form tutors, academic mentors or strong teachers from other subjects)
- large group sessions provided for two teaching groups. Taught by pairs of teachers and supported by a strategic team (see above) to facilitate active group tasks
- build confidence and self-belief in mathematics learning. Ensure teachers in other subjects do not make negative or flippant remarks about the subject. Provide mathematical equipment and access to supportive software for target pupils

Ensure that clear expectations of progress are shared among senior leaders, teachers, teaching assistants (TAs), target pupils and parents/carers.

Discuss the level of departmental confidence in planning lesson sequences. If this needs development see Core Plus Element 2: Planning for progression in mathematics.

Discuss the level of departmental confidence in teaching for understanding. If this needs development see Core Plus Element 3: Improving mathematics subject pedagogy and the climate for learning.

Design Wave 2 and Wave 3 interventions for target groups and individuals. If this needs development, see Core Plus Element 5: Intervention and personalisation in mathematics.

Ensure that the SLT are aware of the balance between:

- numbers of pupils requiring intervention support
- the staffing level and expertise in the department
- the underlying issues in the school.

Take bold decisions and find creative solutions so that departmental suggestions about how to facilitate intervention can be taken forwards.

Senior leaders and SL take a strong lead to ensure that all teachers and supporting adults talk about mathematics in a positive way.

- draw together into a new tutor group so that additional motivational approaches, academic mentoring and study support can be more easily and regularly provided.

Discuss and agree the design of the mock examination. Arrange time to analyse mock results and to plan the spring term programme.

Evaluate the effectiveness of the autumn term actions against curricular progress, pupil engagement and confidence and teacher expectations and confidence.

If intervention approaches are underdeveloped, see Core Plus Element 5: Intervention and personalisation in mathematics. In particular refer to the Key Stage 4 learning challenge.

Ensure that the mock exam is designed to accurately reflect progress towards GCSE assessment criteria and provides a diagnostic opportunity. Make sure the gap between the mock and the final exam is long enough for this diagnosis to refocus planning, teaching and intervention.

Lead the evaluation of the effectiveness of the autumn term actions, feed into the Raising Attainment Plan (RAP).

Agree next steps.

Actions for the mathematics department	Related leadership and support (SLT, SL, key teacher, AST, consultant)
<b>Spring term: maintaining momentum, focusing on revision</b>	
<p>Act on points from autumn term evaluation. Maintain and sharpen all elements-based teacher assessment and evaluation of mock examination. See Help sheet 3: <i>HS3: Carrying out a script analysis</i>.</p> <p>Begin an effective revision and exam preparation programme as part of regular lessons and in targeted workshops and surgeries. Base provision on monitoring of progress and tailor to suit targeted pupils:</p> <ul style="list-style-type: none"> <li>– include individual support for time lines/timetables of revision, in class, in school and at home</li> <li>– give pupils guided access to online revision packages and provide the equipment required for the exam</li> <li>– plan engaging collaborative tasks to improve the way pupils access and tackle exam-style questions See Help sheet 4: <i>HS4: Creative ideas for examination question practice</i>. Integrate this approach into surgeries and workshops. Monitor attendance and engagement of target pupils</li> <li>– feed back to pupils about specific progress they have made and the next steps they need to make.</li> </ul> <p>Evaluate the effectiveness of the spring term actions against curricular progress, pupil engagement and confidence, and teacher expectations and confidence.</p>	<p>Ensure that clear expectations of progress are shared among senior leaders, teachers, teaching assistants, target pupils and parents/carers.</p> <p>Ensure that mathematics and English SLs take a coordinated approach to supporting target pupils in examination preparation; for example, revision surgeries and workshops address priority curriculum aspects and cater for the needs of target pupils. If this needs development, see Core Plus Element 5: Intervention and personalisation in mathematics.</p> <p>For more detailed suggestions see the <i>GCSE booster packs</i> and <i>KS4 Learning Challenge</i>, which offer guidance for teachers and school leaders on organising a revision programme for exam preparation.</p> <p>For target pupils – keep a close eye on punctuality, attendance and pupils' motivation and engagement with the programme provided in mathematics and more generally across subjects.</p> <p>Lead the evaluation of the effectiveness of the spring term actions, feed into RAP. Agree next steps.</p>
Actions for the mathematics department	Related leadership and support (SLT, SL, key teacher, AST, consultant)
<b>Summer term: boosting confidence</b>	
<p>Act on points from spring term evaluation. Maintain and sharpen all elements based on views of pupils, teachers and other adult support.</p> <p>Ensure that pupils are motivated to attend by believing that they can achieve. Demonstrate this by sharing with them their attainment at the beginning of the year and their progress to date.</p> <p>Make certain that pupils are familiar with the format and timings of examinations. Share</p>	<p>Contribute to the whole-school plan for examination preparation. In particular, ensure a balanced approach on the run up to, and during, the exam period so that pupils feel supported emotionally as well as academically.</p>

tips on exam technique.

Make provision to check and respond to lateness or likely absence on the days of the examination.

Boost pupils' self-esteem in every possible way, including on the day of the examination.

Plan a celebratory de-brief after the examination to acknowledge pupils' efforts and to inform provision for future cohorts.

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## **Review**

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Review against quality standards.

<b>After six weeks of implementation make a judgement about the extent to which:</b>	<b>Specify exactly who will make the judgement – choose from: SLT, SL, key teacher, AST, consultant</b>	<b>Specify how this will inform the RAP and next steps</b>
Pupils are meeting curricular targets and are on track to target grade or level.		
Pupils are actively engaged in their learning and expressing confidence in their progress.		
Pupils are expressing interest and enthusiasm as learners of mathematics.		
Pupils are well informed about the demands of the next examination and are confident about how prepare for it.		

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## Case study

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The aims of the *Near Misses 4+ A\* to C GCSE pilot* were to accelerate the progress of pupils predicted to achieve four A\* to C GCSE grades so that they achieved five or more, and to identify the practical steps and processes that could be put in place to help them improve. Significant gains were made. For many schools these processes are second nature, but the pilot has shown that where they are not, underachievement can be avoided if rapid action is taken. The factors that made a difference to the results of the targeted groups of pupils have informed the guidance described earlier in this element, especially the 'High reward classroom strategies', pp. 9–11 of the *Key finding of the Near Misses 4+ A\*-C GCSE pilot* (see below).

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## Resources

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The following additional resources can be found under 'Core Plus' in the mathematics 'Subject leadership' area at:

[www.nationalstrategies.standards.dcsf.gov.uk/secondary/mathematics](http://www.nationalstrategies.standards.dcsf.gov.uk/secondary/mathematics).

- *Key finding of the Near Misses 4+ A\*-C GCSE pilot* (DCSF ref: 00160-2007BKT-EN)
- The *GCSE booster packs* (DCSF ref: 0696 2003; DCSF ref: 0678-2004) and *KS4 Learning Challenge* (DCSF ref: 0088-2004 G) offer guidance for teachers and school leaders on organising a revision programme exam preparation
- The Venn analysis tool – see RAP management guide and Element 6 of Stronger Management Systems

Help sheets available as optional downloads from the same source as this paper

HS2 Points to consider – examination entry

HS3 Carrying out a script analysis

HS4 Creative ideas for examination question practice

## Continuing Professional Development (CPD)

A stimulating source of ideas for the type of teaching strategies which can engage a class with revision is illustrated in *Dora's video*. This was part of subject leader development materials (SLDM) distributed through LA networks in summer 2006. It is designed to inform discussions at a departmental meeting. The context is a Year 11 class revising shape and space problems but the principles can be applied much more widely. The handouts each have a specific theme and would support an initial session lasting between 30 and 45 minutes, followed by gap tasks in the classroom:

- Handout 1.2: Year 11 shape and space revision lesson
- Handout 1.3: Analysing examination scripts
- Handout 1.4: Using visualisations
- Handout 1.5: Classifying examination questions
- Handout 1.6: Pupils solving problems collaboratively

SLDM autumn 2006 DVD ref: 0241-2006DVD-EN

A copy of this DVD could be obtained from the LA mathematics consultant or ordered from DCSF Publications T: 0845 60222 60, email: [dcsf@prolog.uk.com](mailto:dcsf@prolog.uk.com)