

**Assessing pupils' progress in  
mathematics at Key Stage 3**  
**Teachers' handbook**



# Assessing pupils' progress in mathematics at Key Stage 3

## Teachers' handbook

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## **Disclaimer**

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# 1. Assessing pupils' progress – an introduction

In May 2008, the DCSF published the Assessment for Learning (AfL) Strategy<sup>1</sup>.

The aims of the strategy are that:

- **Every child** knows what progress they are making and understands what they need to do to improve and how to get there. They get the support they need to be motivated, independent learners on an ambitious trajectory of improvement.
- **Every teacher** is equipped to make well-founded judgements about pupils' attainment, understands the concepts and principles of progression, and knows how to use their assessment judgements to forward plan, particularly for pupils who are not fulfilling their potential.
- **Every school** has in place structured and systematic assessment systems for making regular, useful, manageable and accurate assessments of pupils, and for tracking their progress.
- **Every parent and carer** knows how their child is progressing, what they need to do to improve, and how they can support the child and their teachers.

The AfL Strategy document provides a vocabulary that helps to clarify the three linked aspects of assessment and that can be consistently applied across curriculum areas and phases.

**Day-to-day** assessment provides a wide range of evidence of learning in specific contexts which shapes immediate next steps.

**Periodic** review of this evidence gives a clear profile of pupils' achievement across a whole subject and informs and shapes future planning and targets for improvement.

When required, these judgements and insights can be more formally shared between pupils, parents and teachers at **transitional** points between year groups, schools and phases.

The key features of these three assessment viewpoints are summarised here:

<b>Day-to-day</b>	Learning objectives made explicit and shared with pupils Peer and self-assessment in use Pupils engaged in their learning and given immediate feedback
<b>Periodic</b>	Broader view of progress across subject for teacher and learner Use of national standards in the classroom Improvements to medium-term curriculum planning
<b>Transitional</b>	Formal recognition of pupils' achievement Reported to parents/carers and next teacher(s) May use external tests or tasks

<sup>1</sup> <http://publications.teachernet.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=DCSF-00341-2008>

The APP approach supports teachers' assessment and their understanding of pupils' attainment and progress in each of these three linked aspects but it is particularly designed to strengthen periodic assessment.

This handbook focuses on the process of periodic assessment, and also refers to aspects of day-to-day practice that provide evidence for periodic assessment. It does not deal directly with the process of transitional assessment.

## 1.1 What is Assessing Pupil Progress (APP)?

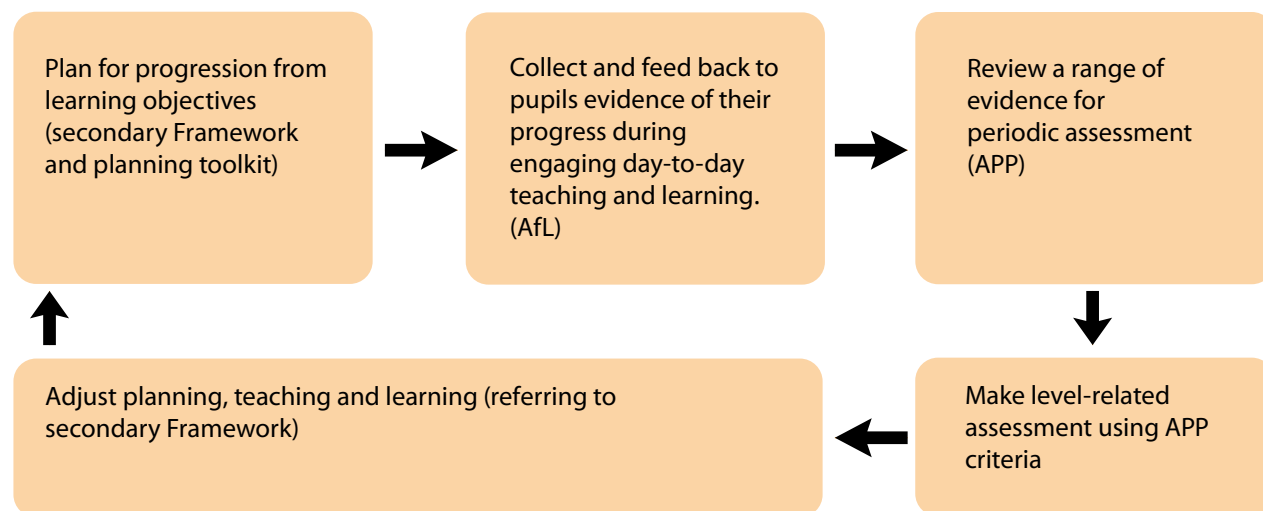
Assessing Pupils' Progress (APP) is a structured approach to periodic assessment, enabling teachers to:

- track pupils' progress over a key stage or longer;
- use diagnostic information about pupils' strengths and weaknesses to improve teaching, learning and rates of pupils' progress.

Using APP materials, teachers can make more consistent level-related judgements in National Curriculum subjects.

The APP approach improves the quality and reliability of teacher assessment and has proved to be robust, manageable and effective in practice.

APP supports planning for progression in learning and helps teachers to develop their skills and judgements in assessing pupils' progress. It involves generating evidence of progress through effective teaching and learning and then 'stepping back' periodically to review pupils' achievement in relation to National Curriculum levels.



## 1.2 What are the benefits of adopting APP?

APP is valuable to teachers because it has the potential to enhance pupils' progress by:

- increasing the consistency and reliability of teacher assessment;
- supporting teachers in aligning their judgements systematically with national standards;
- linking day-to-day and periodic approaches to assessment;
- providing high-quality evidence to inform next steps in pupils' learning and reporting on pupils' progress;

- integrating assessment into planning for progression;
- providing a National Curriculum attainment target level when needed, from an informed, holistic evaluation of progress against APP assessment criteria.

School leaders and teachers who have been involved in the APP pilots have reported that the main advantages for a department of adopting APP are that it:

- gives a detailed profile of what a pupil can do in relation to the assessment criteria;
- contributes to improved learning and more responsive teaching;
- contributes to the professional development of all teachers, particularly of less experienced colleagues;
- helps teachers prioritise areas of the curriculum where teaching and learning need to be strengthened;
- strengthens AfL and in particular questioning and talk about pupil understanding in lessons.

### 1.3 How does APP contribute to the Assessment for Learning (AfL) Strategy?

APP provides systematic support for the three linked aspects of assessment:

Aspect	AfL Strategy	APP contribution
Day-to-day	<ul style="list-style-type: none"> <li>Learning objectives made explicit and shared with pupils</li> <li>Peer and self-assessment in use</li> <li>Pupils engaged in their learning and given immediate feedback</li> </ul>	APP encourages recognition of a wide range of evidence from pupils' ongoing, day-to-day work
Periodical	<ul style="list-style-type: none"> <li>Broader view of progress across subject for teacher and learner</li> <li>Use of national standards in the classroom</li> <li>Improvements to medium-term curriculum planning</li> </ul>	APP enables the review of evidence to be systematic by focusing closely on level-related criteria in each of the assessment focuses
Transitional	<ul style="list-style-type: none"> <li>Formal recognition of pupils' achievement</li> <li>Reported to parents/carers and next teacher(s)</li> <li>Use external tests or tasks</li> </ul>	APP strengthens teachers' assessments and their understanding of pupils' progress, so that this more formal sharing can be valid, reliable and detailed

The DCSF's AfL Strategy describes how AfL is not an isolated activity but feeds into the school's cumulative understanding of pupils' achievements. This comes from both day-to-day and periodic assessment, with evidence contributing to an increasingly well-informed, rounded and reliable picture of an individual pupil's performance. APP will support senior leaders in schools to ensure that their approach to AfL is part of a manageable and school-wide system.

## 1.4 APP background and future developments

APP materials have been developed through extensive piloting in schools. This has involved the Qualifications and Curriculum Authority (QCA) and the National Strategies and has been funded by the Department for Children, Schools and Families. Materials for primary schools covering reading, writing and mathematics have already been published on the Primary National Strategy website at: [www.standards.dcsf.gov.uk/primaryframework/assessment/app/](http://www.standards.dcsf.gov.uk/primaryframework/assessment/app/).

National materials are now available for reading, writing and mathematics at key stages 1, 2 and 3 and for science and ICT at Key Stage 3.

Further information on the APP approach to teacher assessment is available on the QCA website at [www.qca.org.uk/assessment](http://www.qca.org.uk/assessment) and on the Secondary National Strategy website at [www.standards.dcsf.gov.uk/secondary/framework/](http://www.standards.dcsf.gov.uk/secondary/framework/), where, together with support for effective teaching and learning, APP materials for English and mathematics are available to view and download.

## 1.5 How to use this handbook

This handbook is for subject leaders and their departments, to help them implement APP effectively in the classroom. Section 2 of this guide provides advice on putting APP into practice and section 3 demonstrates how schools can implement APP. Section 4 shows the process required to make APP assessments.

The APP pilots have shown that the active involvement of a senior member of school staff is critical to successful implementation of this approach. An additional leaflet is provided that suggests the initial considerations for the headteacher and school senior leadership team (SLT), the planning decisions required to identify the staff to be involved, their continuing professional development (CPD) and training needs, and the activities to secure teachers' assessment judgements through planned in-school standardisation and moderation activity.



## 2. APP in practice

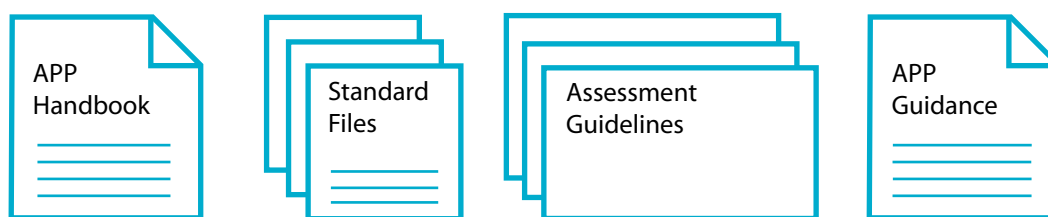
APP has a number of linked purposes:

- The identification through periodic assessment against national criteria of relative strengths and weaknesses in the different assessment focuses for mathematics which can:
  - indicate the next important learning steps for individual pupils (curricular targets);
  - reveal areas of learning that need to be strengthened in a whole class or year group through curriculum changes.
- The planning of specific outcomes for teaching and learning and well-matched assessment opportunities in schemes of work, to ensure that pupils make two levels of progress over a key stage.
- The periodic assessment of pupils' progress through the assignment of a National Curriculum level at given intervals throughout the key stage to supply secure tracking information.

Achieving these purposes using the APP approach is straightforward.

- At the point of planning for a sequence of teaching, APP is used to identify intended assessment outcomes linked to the Framework objectives being taught, for the range of pupils in the class.
- At regular intervals, which are planned to fit in with school assessment policy, teachers review pupils' work using APP guidelines to build a profile of their attainment and assign overall levels for mathematics.
- The assessments are used to inform future learning and teaching in class, curriculum planning and provision for additional support and intervention for pupils struggling to make progress.

### 2.1 The APP resources



There is a range of APP resources available:

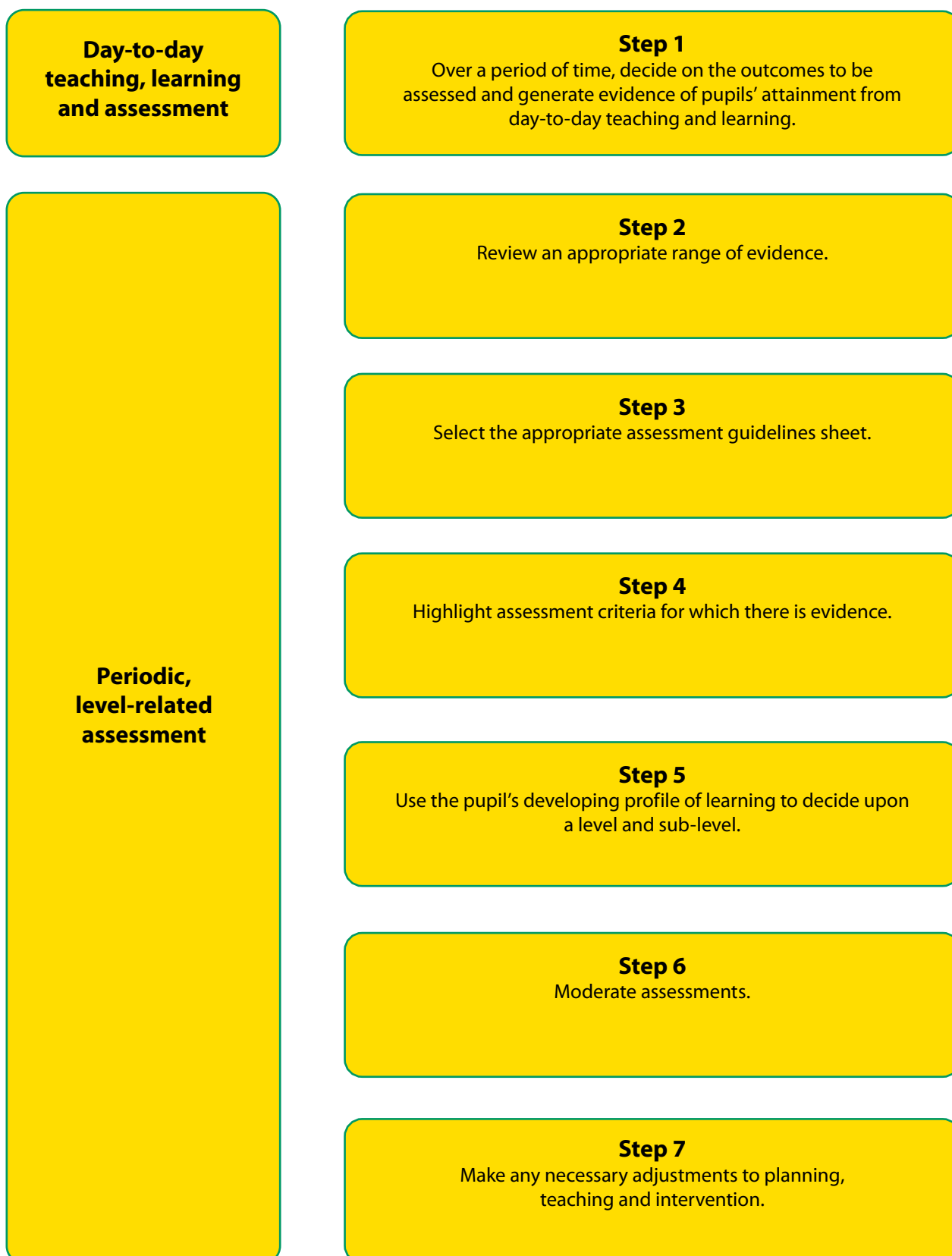
- This document, the **APP Handbook**, explains the whole-school context for assessment, and introduces APP as a tool for periodic assessment. It provides all of the practical guidance that departments will need to develop and embed APP in mathematics.
- The **Standards Files** are exemplifications of the national standards. These will help departments to reach consistent and reliable judgements about National Curriculum levels for different areas of mathematics. The Standards Files are described more fully in the Appendix of this handbook.
- The **Assessment Guidelines** set out level-related APP assessment criteria for mathematics. These are available in two formats. An A3 version covering levels 2 to 8 is available to download from the Framework website. Alternatively, a set of A4 versions, covering two National Curriculum levels on each sheet, is provided with the APP materials. Either version will provide a simple recording format for an individual pupil, containing the assessment criteria for each element of mathematics.

- **The APP Guidance Booklet** (forthcoming) provides additional support for departments in implementing the APP approach.

These materials update and replace the original APP materials published in January 2007. The original materials include extensive guidance on classroom practice (including probing questions) and provide assessment tasks designed to provide additional assessment evidence where the evidence from pupils' ongoing work is limited. These assessment tasks were not designed to be the main source of assessment evidence and should not be used exclusively for that role.

## 2.2 The APP process

The diagram summarises the sequence of events involved in APP as a series of seven steps. The sequence assumes that teachers will already have participated in standardisation exercises to ensure consistent interpretation of the assessment criteria.



At certain times, the outcomes of Step 5 will be used for the purposes of transitional assessment such as reporting on a pupil's attainment at the end of a school year.

Section 2.3 of this handbook describes each of these steps in more detail.

## 2.3 APP step-by-step

### **Step 1: Over a period of time, decide on the outcomes to be assessed and generate evidence of pupils' attainment from day-to-day teaching and learning**

As part of the planning of teaching and learning for any class, teachers will identify relevant assessment criteria. Evidence is then generated over a period of time and forms the basis of the APP process of periodic assessment, which involves stepping back from the daily and weekly process of teaching, and assessing progress made across the subject over a longer period – perhaps a whole term.

### **Step 2: Review an appropriate range of evidence**

Teachers will need to take account of a manageable range of evidence to inform and support APP assessments against the APP criteria. While some exercises and worksheets may provide some evidence of pupil achievement, teachers in the pilot project found that open-ended, less scaffolded tasks and activities allowing pupils to demonstrate more independent understanding were a richer source of evidence. Teachers will also need to consider more ephemeral evidence of pupil achievement, such as discussions between pupils and between teacher and pupils. (Note: Additional APP guidance will support this.)

### **Step 3: Select the appropriate assessment guidelines sheet**

Each pupil will need an assessment guidelines sheet that will be used to record assessments by highlighting relevant criteria. The A3 version of the guidelines covers all levels from 2 to 8, making it easier to develop a sense of progression through the levels. Alternatively, the A4 versions of the assessment guidelines each cover two National Curriculum levels, with overlaps. For example, there are forms covering levels 3 and 4, 4 and 5, 5 and 6, and so on. If working with the A4 versions, teachers should choose an appropriate form for each pupil so that periodic assessments can build up a profile of the pupil's learning over time. (Teachers will usually start with a broad idea of the National Curriculum level that a pupil is working from – perhaps based on prior formal assessments.) Follow the instructions set out in section 4 of this handbook ('How to Make APP Assessments').

### **Step 4: Highlight assessment criteria for which there is evidence**

Teachers should now consider the APP criteria in relation to the assembled evidence and highlight the criteria that have been met. For many teachers, it will take time before this process becomes quick and efficient; however, the experience of the pilot project suggests that the process of agreeing levels within the department, based on the guidance in the Standards Files, will help teachers to develop a better feel for levels and progression. The Appendix to this handbook contains full guidance on using the Standards Files.

### **Step 5: Use the pupil's developing profile of learning to decide upon a level and sub-level**

As successive assessments are made by highlighting criteria in the table, a profile of learning is established. For each strand shown in the table, a box can be ticked to indicate that a particular level has been reached. Alternatively, 'IE' can be chosen to indicate that there is currently insufficient evidence to judge progress in a particular strand. Judgements for each attainment target are refined into 'Low', 'Secure' or 'High' within the level.

At intervals, teachers will use the process described in section 4 of this handbook to arrive at an overall National Curriculum level for individual pupils. This is done by taking into account how independently, how consistently and in what range of contexts pupils demonstrate their attainment across the separate strands. The overall level can be recorded at intervals in the boxes provided at the bottom of the form.

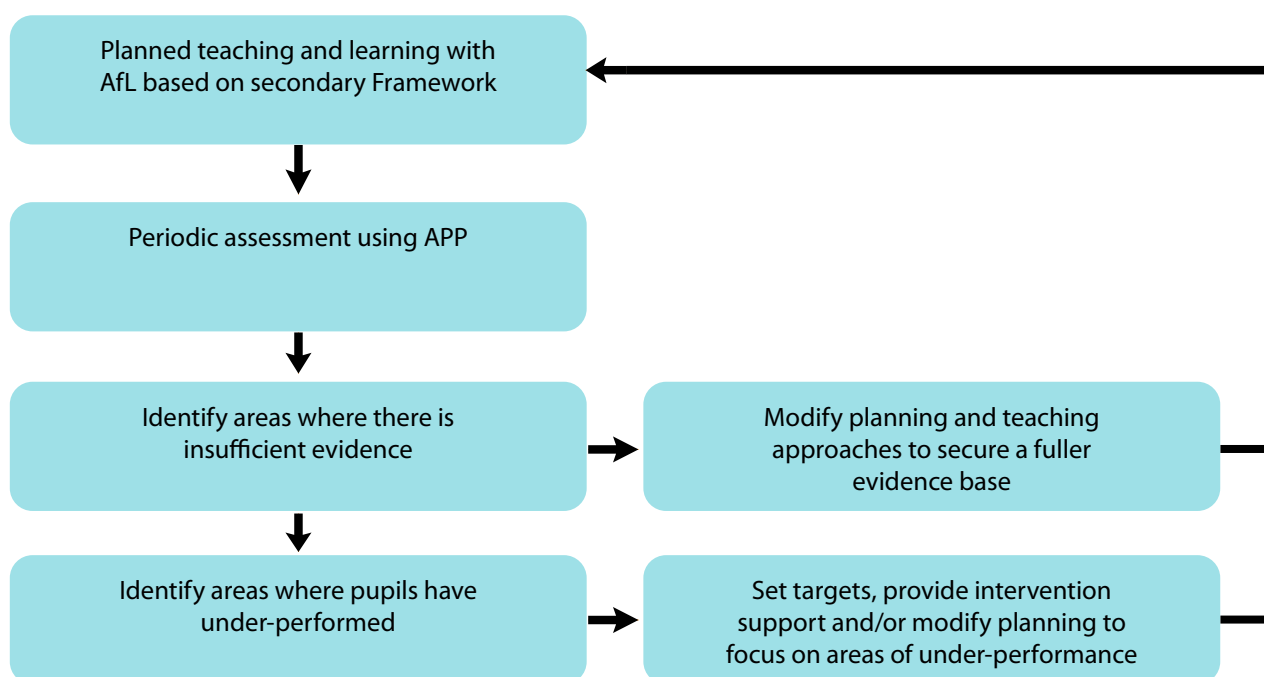
### Step 6: Moderate assessments

Assessment against APP criteria inevitably involves a degree of interpretation and professional judgement. Departments will need to ensure that, before they start to use APP, teachers have the chance to become familiar with the assessment criteria, and how these are consistent with national standards (standardisation). Once they begin to make their own judgements, they need to have the chance to explain and justify a sample with other teachers to ensure consistency (moderation). The Standards Files will help both these processes, as explained in the Appendix. Teachers should make regular reference to the Standards Files to strengthen their understanding of the levels across the National Curriculum strands, and to help to resolve ambiguous or borderline assessments. Regular collaborative assessment and discussion is an important means of ensuring that assessment standards across the department are reliable and consistent.

### Step 7: Make any necessary adjustments to planning, teaching and intervention

A key purpose of APP is to inform and strengthen planning, teaching and learning. This aspect of APP can have a direct and positive impact on raising standards, and can assist in the personalisation of learning.

The diagram below summarises the key aspects of this part of the APP process.



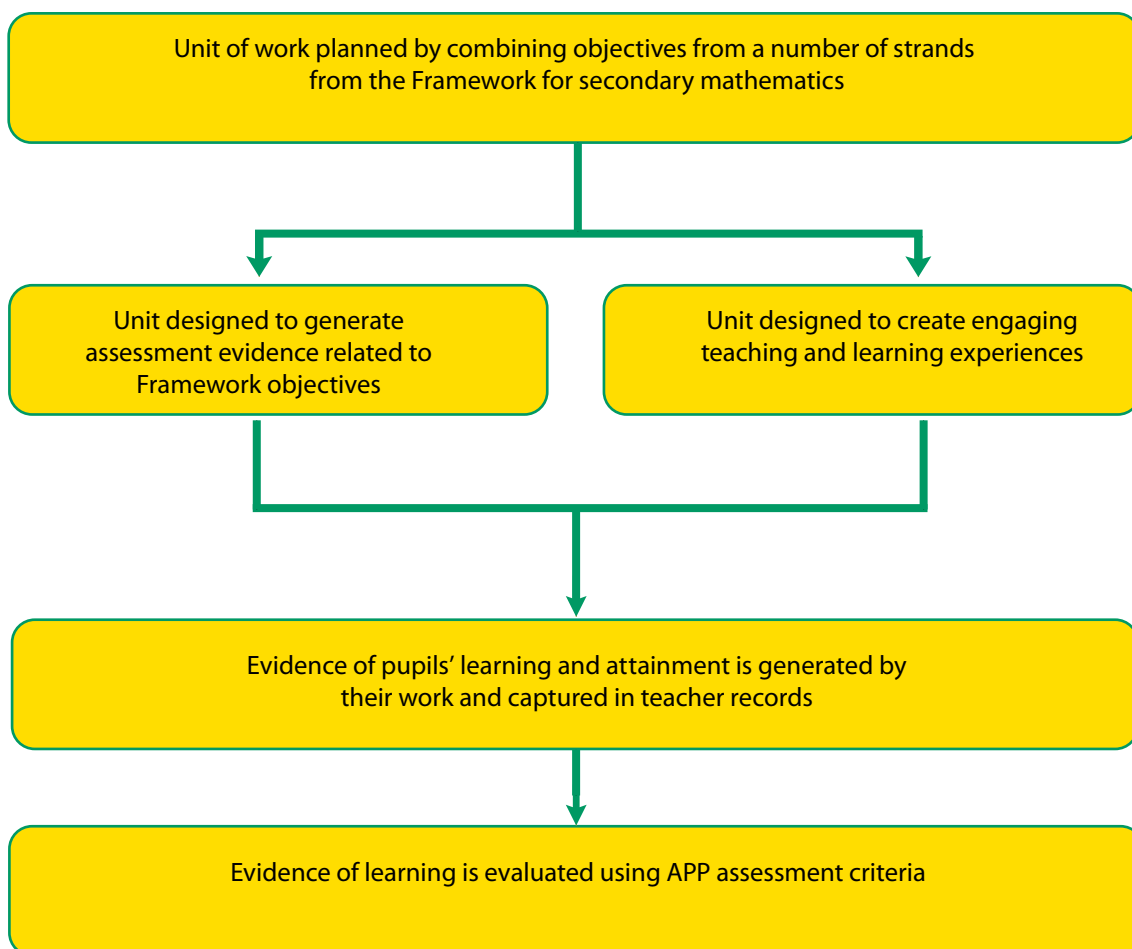
## 2.4 Relationships between APP, the Secondary National Strategy mathematics Framework and the National Curriculum

The APP assessment criteria are based on the National Curriculum level descriptions and link to the Framework for secondary mathematics.

It is important that planning for teaching and learning is based on the objectives from the Framework for secondary mathematics. This will ensure that pupils have their broad curriculum entitlement as described in the National Curriculum. The APP assessment criteria should be used to assess learning outcomes, not to lead the curriculum.

The assessment criteria do, however, inform planning because teachers need to have an idea of the type of assessment evidence that any sequence of lessons will generate. For this reason, in the Framework for secondary mathematics, the objectives are linked to APP assessment criteria. This allows teachers to see, in advance, the areas and focuses for assessment their planned unit of work will allow.

This is represented in the diagram below:



To see the way that learning objectives are linked to the APP assessment criteria, go to: [www.standards.dcsf.gov.uk/secondary/frameworks](http://www.standards.dcsf.gov.uk/secondary/frameworks).

The table below clarifies the distinction between the learning objectives of the Frameworks and the assessment guidelines of APP.

National Strategy Frameworks	APP guidelines
Based on the statutory programme of study for the subject, each Framework sets out in detail the learning objectives which form the basis for teachers' medium- and short-term planning. They seek to identify progression in the curriculum.	Based on the statutory level descriptions for the subject, the criteria which are set out in the assessment guidelines describe the characteristic performance of pupils at each level within key aspects of the subject.
The Framework objectives are the principle reference point for planning full curriculum coverage of a subject.	The APP guidelines give teachers a basis for periodically considering the available evidence and judging how well pupils have succeeded across the subject as a whole.
While schools and teachers are free to plan a curriculum which will engage their particular learners, the Frameworks specify what needs to be covered within the teaching of a specific subject.	The assessment criteria are sufficiently broad to allow a wide range of evidence to be taken into account. Much of this derives from classroom teaching of the subject but evidence can be drawn from other subjects and from pupils' learning beyond the school.
Framework learning objectives are presented within 'strands'; teachers can use the curriculum progression within these strands to determine the appropriate pitch of the work for pupils of different abilities within the class.	The assessment guidelines provide a structure for looking at the evidence of pupils' learning. They focus on significant aspects of performance in the subject.
Framework learning objectives set out in reasonable detail the knowledge, skills and understanding which need to be acquired in that subject across a period of time.	APP criteria generally describe a small number of features of pupils' work or learning which are characteristic of their independent performance at each level in each strand.
Clarity about the objectives of specific teaching gives pupils a greater sense of purpose and direction. It also provides a strong basis for immediate feedback to the pupil in the specific context of the teaching and learning.	Use of the APP criteria gives teachers and pupils a broader view of learning across the whole subject over a period of time (typically over a term) and across different contexts.
The learning objectives represent the basis of a curriculum experience for every learner; teachers will organise and present them in a variety of ways and pupils in all types of settings will engage with them differentially.	APP criteria are predicated on pupils of all abilities having access to the full curriculum; they allow the variation in pupils' responses to be assessed periodically and they help teachers identify where more work is required in day-to-day learning and teaching and where medium-term planning needs to be adjusted.

## 3. Implementing APP

Embedding APP practice should not be seen as an end in itself. Rather, the department should be working on reviewing and strengthening all aspects of teaching and learning, using the full range of resources available in, for example, the renewed Framework and the planning toolkits. Within this work, departments should aim to make at least some APP judgements collaboratively, especially during the early stages of implementation. A collaborative approach to strengthening assessment will provide important feedback on the impact of developments in teaching and learning.

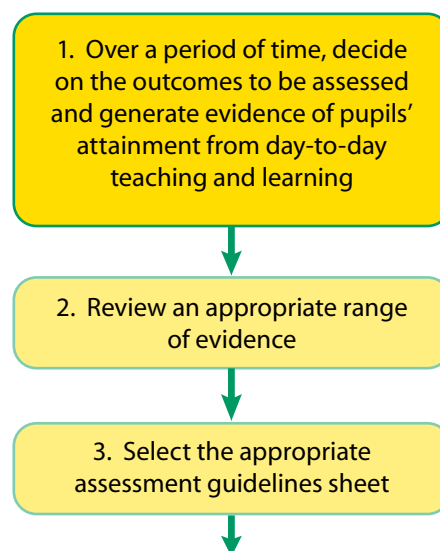
There are various ways in which the collaborative development of APP can be organised. For example, time could be allocated within departmental meetings for standardisation and moderation. Other arrangements could be made to suit the needs of particular departments. For example, a newly-qualified teacher might work with a more experienced colleague to review APP judgements made for a particular class, or an advanced skills teacher could take responsibility for leading APP developments across the department and sharing experiences and expertise with neighbouring schools.

### 3.1 Steps towards implementation

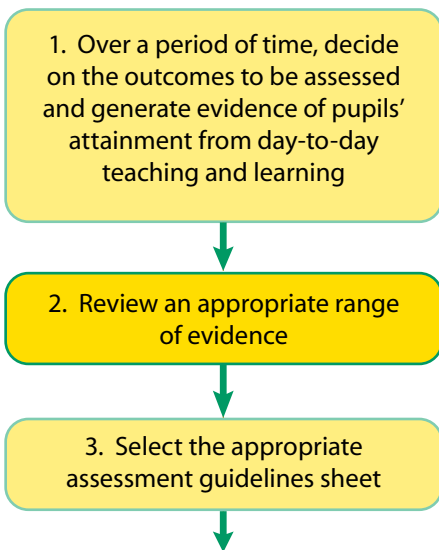
This section provides guidance to subject leaders and other teachers involved in implementing APP in secondary mathematics departments. It is helpful to think of implementation in terms of the seven steps described in section 2.

#### ***Step 1: Deciding on the outcomes to be assessed and collecting evidence of pupils' attainment from day-to-day teaching and learning***

APP is a process of periodic review of work already done, not a new assessment event. At the point of planning from the Framework, teachers will need to be aware of intended outcomes and assessment opportunities. The school assessment policy will influence when teachers will make APP judgements, although subject leaders will need to discuss with senior leaders how APP will be developed to complement and strengthen existing assessment practice. As a basic principle the work reviewed in each periodic assessment should cover a range of areas of mathematics and at least one term's progress. This suggests that departments will most likely formalise their judgements termly, allowing meaningful contributions to whole-school pupil tracking programmes. For mathematics departments that are making initial APP judgements, it will be useful to work collaboratively at first, to ensure that all the teachers in the department develop an understanding of the approach and a common interpretation of the APP criteria.







**Step 2: Review an appropriate range of evidence**

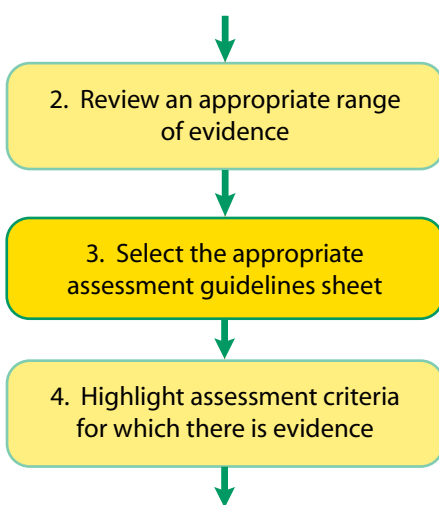
Before departments start to make APP assessment judgements they will need to:

- become familiar with the APP criteria for the relevant levels and areas of mathematics through standardisation;
- identify in planning and teaching the relevant assessment opportunities as necessary to ensure that a full range of evidence is generated;
- be aware of the range of pupil work and records of interaction relevant to the success criteria to be addressed.

These preparatory steps could usefully be tackled over a short series of departmental meetings.

For example, a department might have agreed to work together to make APP judgements for the first term's work in Year 9. The department could then work on these activities:

- Identify the APP assessment criteria that are addressed in the relevant units.
- Decide whether the teaching and learning approaches in the existing units allow sufficient scope for generating the relevant evidence. For instance:
  - Are there enough opportunities for mathematical dialogue and discussion that can allow teachers to probe pupils' understanding? How will 'ephemeral' evidence of this kind be collected?
  - Are there open-ended tasks that allow pupils to demonstrate their independent mastery and understanding of the key areas?
- If necessary, adjust unit plans so that a comprehensive but manageable set of evidence will be available in pupils' exercise books, without the need to collect significant additional information.



**Step 3: Select the appropriate assessment guidelines sheet**

If using the A4 version of the guidelines sheet, teachers can now work together, perhaps in small groups, to select the appropriate assessment guidelines sheet for an initial sample of pupils, based on their knowledge of the approximate National Curriculum levels at which pupils are working. The process of arriving at a reliable APP assessment can be thought of as 'zooming in' on a pupil through increasing levels of detail. At this stage, teachers can use quite general data (such as key stage test results, or mathematical target levels) to decide on a likely level borderline and the appropriate APP form for each pupil.

The A3 version of the guidelines sheet covers all of the levels from 2 to 8, so if this version is used there will be no need to decide on a likely level borderline at this stage. All that will be required is to produce a copy of the sheet for each pupil.

**Step 4: Highlighting assessment criteria for which there is evidence**

This is the crucial stage at which teachers decide what constitutes 'success' for each of the criteria being considered. It is important that all of the teachers in the department develop a secure and consistent interpretation of the APP assessment criteria, so that reliable assessments can be made against national standards. For most departments, developing this expertise is likely to be a major piece of collaborative professional development to be tackled over a significant period of time. It is important that all teachers are involved in a continuing professional discussion in order to reach a consistent interpretation within the department. The Standards Files provide an agreed set of national benchmarks against which the department's judgements can be standardised and then moderated. There is more guidance on using the Standards Files in the Appendix to this booklet.

**Step 5: Use the pupil's developing profile of learning to decide upon a level and sub-level**

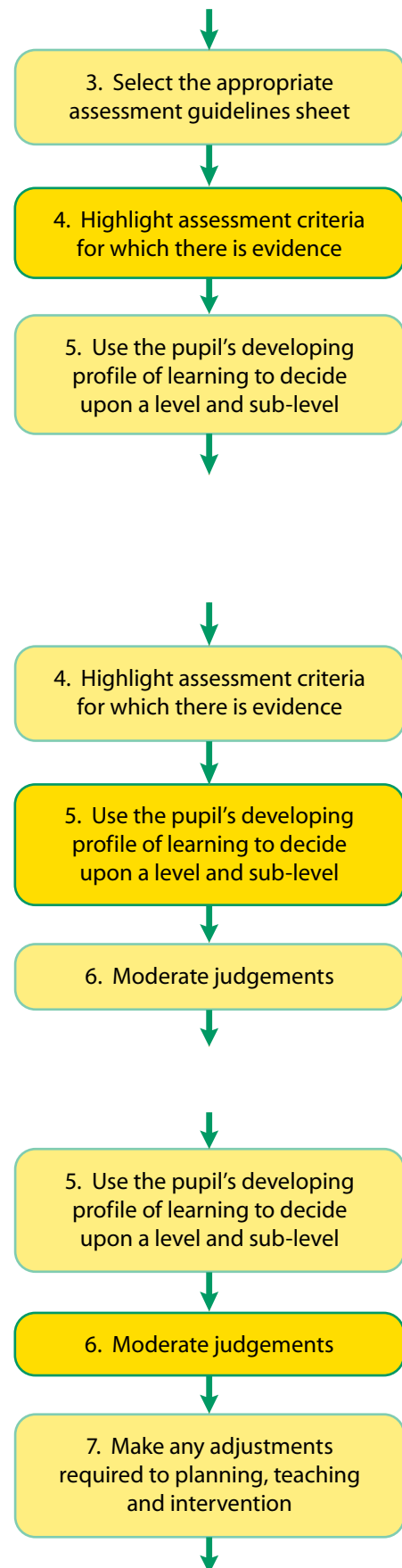
Reaching a reliable level and sub-level is another aspect of the APP process that will benefit from collaborative development. For example, pairs of teachers could work through completed assessment grids from their respective classes, and discuss and decide upon overall levels, using their knowledge of the pupils concerned.

This stage should not be rushed. It may take time before the developing profile of learning shown on the guidelines sheet has sufficient coverage to allow an overall judgement to be made. It is also likely to take a significant amount of time for teachers to develop the confident grasp of the criteria that is required to allow overall judgements to be made.

**Step 6: Moderate judgements**

Moderation activities could form a regular part of departmental meetings. For example, teachers could be asked to present judgements made against APP assessment criteria for a particular pupil, and to justify these judgements using evidence from the pupil's work. The use of the Standards Files to resolve differences of interpretation would be an important aspect of this work.

Most mathematics teachers have experience of moderating and standardising pupils' work from their involvement with GCSE coursework. While coursework is now defunct, the skills developed will be very useful when considering APP judgements.



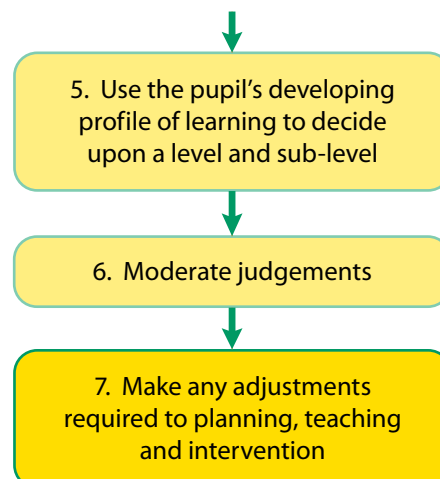
**Step 7: Making any adjustments required to planning, teaching and intervention**

As the use of APP develops, departments will be building up a profile of learning for individual pupils, and will also be developing their understanding of patterns of achievement across year groups, classes and units of work.

A continuing focus on moderation and standardisation will be essential to ensure that APP data is accurate and reliable. Providing this happens, APP will provide a wealth of data that will enable departments to make informed decisions about planning, teaching and intervention.

For example:

- Where there is a disparity in performance on particular assessment criteria between similar classes following the same scheme of work, the teachers involved could work together, perhaps observing each others' lessons, to identify and share features of effective practice.
- APP data can be used to inform pupil tracking, and to assist early identification of pupils at risk of underachievement, for whom intervention teaching might be appropriate.
- As departments review their schemes of work, APP evidence can be used to help to evaluate the effectiveness of current approaches, and identify areas for development.



## 4. How to make APP assessments

The table below summarises the process to follow when using APP to make periodic teacher assessment judgements.

Materials required	Process to be followed
<p>You will need:</p> <ul style="list-style-type: none"> <li>Evidence of what pupils have achieved independently that is significant and representative. Pupils' exercise books will often be the main source of such evidence, perhaps backed up by brief teachers' notes recording contributions to group or oral work.</li> <li>Assessment guideline sheets for the pupils to be assessed.</li> <li>The Standards Files for reference.</li> </ul>	<p><b>Stage 1: Making attainment target judgements</b></p> <ul style="list-style-type: none"> <li>Select the appropriate assessment guidelines sheet for each pupil.</li> <li>Consider the evidence in relation to the criteria and highlight those which have been met.</li> <li>Decide which level offers the best fit for each attainment target referring to the Standards Files as necessary, and tick the appropriate level-related box.</li> </ul>
	<p><b>Stage 2: Making an overall level judgement</b></p> <ul style="list-style-type: none"> <li>Use the profile of attainment as recorded in the assessment guidelines across the individual attainment targets to decide upon an overall level or sub-level for mathematics. The overall level is the highest level at which all or most of the assessment criteria for each strand are highlighted. This overall level can be refined into low, medium or high sub-levels as follows: <ul style="list-style-type: none"> <li>High: Almost all the criteria for the level are highlighted across all strands, with some criteria in the level above being highlighted for some or all strands.</li> <li>Secure: The large majority of the criteria for the level are highlighted in each strand. There may be a few unmet criteria, but the highlighting shows that the standard for the level has been substantially met across each of the attainment targets.</li> <li>Low: While the majority of the criteria for the level are highlighted, there are substantial gaps. The pupil is working within the overall level, but there are significant areas that need to be developed further before secure performance at the level is demonstrated.</li> </ul> </li> </ul> <p>The terms 'low', 'secure' and 'high' broadly equate to sub-levels a/b/c for the purpose of recording and tracking data. Rather than being based on a mathematical formula for sub-dividing a level, 'low', 'secure' and 'high' reflect the professional nature of the judgements that are made through APP, based on a teacher's consideration of a range of evidence over time.</p>
	<p><b>Stage 3: Checking the overall level judgement</b></p> <ul style="list-style-type: none"> <li>Check, standardise and moderate the final judgement against the relevant Standards Files.</li> </ul>

# Appendix

## The Standards Files

The Standards Files for mathematics are a central part of the Assessing Pupil Progress (APP) approach to periodic assessment. Their main purpose is to exemplify standards by giving guidance on accurate assessments and acting as a resource and reference point for teachers:

- on assessing pupils' work;
- on diagnosing pupils' strengths and weaknesses;
- for training and professional development purposes.

The Key Stage 3 Standards Files for mathematics have been developed to exemplify standards and to provide guidance, accurate assessments, and a resource and reference point for teachers. They will be used to support teachers making judgements on a periodic basis as part of normal school assessment arrangements and at the end of Key Stage 3. The Standards Files are linked to the attainment targets of the current National Curriculum for two reasons:

1. Level-related judgements should be consistent, independent of the age of the pupil, so the files are in line with those already published for Key Stage 2.
2. For the majority of pupils currently in Key Stage 3, the existing attainment targets will continue to be applicable for statutory teacher assessments until 2011.

The Key Stage 3 Standards Files have been compiled over the last 18 months, drawing on work completed by pupils under the 2000 National Curriculum. QCA is already working with schools to gather new pupil work based on the 2008 curriculum. This work will complement and eventually replace the current Standards Files as the new curriculum continues to be implemented.

The current set of Standards Files mainly exemplify 'Low' and 'Secure' attainment at a range of levels. This will support teachers in deciding on the full range of sub-levels, including 'High' attainment at each level, by comparison with the examples given.

Each Standards File includes:

- examples of pupils' ongoing classroom work, which have been assessed to exemplify the APP approach and show national standards;
- commentary on the evidence at attainment target strand level, which leads to a summative judgement on the pupils' work;
- an assessment guidelines sheet that records a profile of attainment across the different strands of mathematics as well as a National Curriculum level judgement.

## Pupils' work in the Standards Files

The files exemplify attainment from Years 7, 8 and 9 at National Curriculum levels 3 to 8. Each Standards File comprises a number of pieces of work. Some of the evidence is written and some of it is in the form of notes made by the teacher when working with the pupils, or when observing them in class. There are also summary notes made by the teacher about what the range of work demonstrates about a pupil's mathematical attainment. The level of annotation on the work presented in the Standards Files is far more than a classroom teacher would be expected to record. The Standards Files are annotated as they need to stand alone – the classroom teacher is not available to discuss what the evidence amounts to and what additionally they know about a pupil's work.

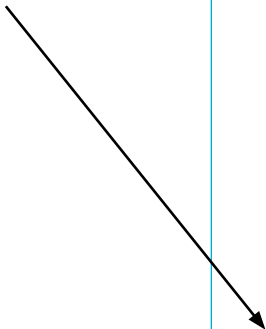
Background information about the context of the work has been kept to a minimum since each collection has been selected primarily to exemplify attainment at a particular National Curriculum level and in a relevant year group, rather than as an example of recommended curriculum practice. In most cases, the pupil's work in a file represents a small sample of the pupil's output during the period. In each case, the criterion for the size of the collection is the same: how much is sufficient to support a teacher in making a level judgement against the attainment target?

## National standards exemplified

Each collection of pupils' work has been assessed using an assessment guidelines sheet. Three kinds of annotation or commentary may support assessment of the pupils' work.

### 1. Assessment summary

These consider all the evidence and provide an overall level judgement.



## Pupil A – Year 7 – Low level 5

### Assessing pupils' progress in mathematics at Key Stage 3

#### Assessment summary

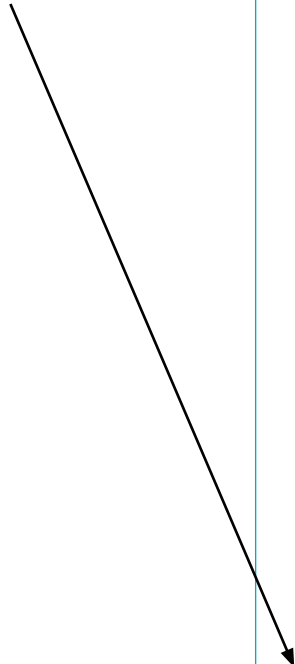
Pupil A's teacher judges that her attainment in mathematics overall is best described as low level 5. Pupil A's performance is strongest in shape, space and measures and there is evidence that she is working at level 5 in some aspects of using and applying mathematics, number, algebra and handling data.

#### Using the Standards Files

- The current Standards Files are based on work planned and assessed in relation to the 1999 National Curriculum programme of study. A new set of Standards Files based on the 2008 National Curriculum are currently in production, but the current set will provide useful guidance on making APP assessments against national standards in the transition period as the new programmes of study are introduced.
- The commentaries in the Standards Files are provided for guidance and reference, and are much more extensive than any teacher would be expected to make when carrying out APP assessments. It is also important to remember that APP encourages and enables a broader overview of current learning, and that there is no need to collect special portfolios of pupils' work. Evidence from pupils' written and oral work, backed up by brief teacher's notes where necessary, is all that is required.
- The evidence base presented in each Standards File is necessarily partial, as it would of course be impractical to reproduce all of each pupil's work. Examples of each pupil's work have been selected to provide evidence to support judgements against APP criteria. This evidence should be considered in conjunction with the teacher's notes, which will provide a broader context and further justification for the assessments that are made.

## 2. Teacher's notes

At the end of each piece of pupil's work a commentary summarises what has been demonstrated.



### Assessment focus

Using and applying mathematics; Algebra; Numbers and the number system

### Context

Homework: Pupils looked at some growth patterns in class and completed work on a hidden faces investigation with their own variation.

Hidden faces

Number of Cubes	1	2	3	4	5	6	Pattern:- goes up by 3
Number of visible faces	5	8	11	14	17	20	
Number of hidden faces	1	4	7	10	13	16	

Number of Cubes	4	8	12	16	20	24	Pattern:- goes up by 4
Number of visible faces	12	20	28	36	44	52	
Number of hidden faces	4	8	12	16	20	24	

### Teacher's notes

- grows a line of linking cubes and records numbers of visible and hidden faces
- looks for number patterns and relationships in her results
- uses cubes to demonstrate why the numbers of visible and hidden faces go up in threes
- creates her own extension based on a unit of four linked cubes and counts visible faces correctly

### Next steps

- use cubes to check the number of hidden faces in her own pattern
- reflect on the total of visible and hidden faces at each stage in both examples



### 3. Annotation on an assessment guidelines sheet

At the end of each Standards File a completed assessment guidelines sheet shows how the pupil's work is assessed and provides information towards making a judgement of 'Low', 'Secure' or 'High' within a level.

Pupil name.....A.....Class/group.....Date.....

	Using and applying mathematics	Numbers and the number system	Calculating	Algebra	Shape, space and measure	Handling data
<b>Level 3</b>	<ul style="list-style-type: none"> <li>identify and obtain necessary information to carry through a task and solve mathematical problems</li> <li>check results, considering whether these are reasonable</li> <li>solve word problems and investigations from a range of contexts</li> <li>show understanding of situations by describing them mathematically using symbols, words and diagrams</li> <li>draw simple conclusions of their own and give an explanation of their reasoning</li> </ul> <input type="checkbox"/>	<ul style="list-style-type: none"> <li>use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 and 1000 and explain the effect</li> <li>round decimals to the nearest decimal place</li> <li>recognise and use number patterns and relationships</li> <li>use equivalence between fractions and order fractions and decimals</li> <li>reduce a fraction to its simplest form by cancelling common factors</li> <li>understand simple ratio</li> </ul> <input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>use known facts, place value, knowledge of operations and brackets to calculate including using all four operations with decimals to two places</li> <li>use a calculator where appropriate to calculate fractions/percentages of quantities/measurements</li> <li>understand and use an appropriate non-calculator method for solving problems that involve multiplying and dividing any three-digit number by any two-digit number</li> <li>solve simple problems involving ordering, adding, subtracting negative numbers in context</li> <li>solve simple problems involving ratio and direct proportion</li> <li>apply inverse operations and approximate to check answers to problems are of the correct magnitude</li> </ul> <input type="checkbox"/>	<ul style="list-style-type: none"> <li>construct, express in symbolic form, and use simple formulae involving one or two operations</li> <li>use and interpret coordinates in all four quadrants</li> </ul> <input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>use a wider range of properties of 2-D and 3-D shapes and identify all the symmetries of 2-D shapes</li> <li>use language associated with angle and know and use the angle sum of a triangle and that of angles at a point</li> <li>reason about position and movement and transform shapes</li> <li>measure and draw angles to the nearest degree, when constructing models and drawing or using shapes</li> <li>read and interpret scales on a range of measuring instruments, explaining what each labelled division represents</li> <li>solve problems involving the conversion of units and make sensible estimates of a range of measures in relation to everyday situations</li> <li>understand and use the formula for the area of a rectangle and distinguish area from perimeter</li> </ul> <input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>ask questions, plan how to answer them and collect the data required</li> <li>in probability, select methods based on equally likely outcomes and experimental evidence, as appropriate</li> <li>understand and use the probability scale from 0 to 1</li> <li>understand and use the mean of discrete data and compare two simple distributions, using the range and one of mode, median or mean</li> <li>understand that different outcomes may result from repeating an experiment</li> <li>interpret graphs and diagrams, including pie charts, and draw conclusions</li> <li>create and interpret line graphs where the intermediate values have meaning</li> </ul> <input type="checkbox"/>
<b>Level 2</b>	<ul style="list-style-type: none"> <li>develop own strategies for solving problems</li> <li>use their own strategies within mathematics and in applying mathematics to practical contexts</li> <li>present information and results in a clear and organised way</li> <li>search for a solution by trying out ideas of their own</li> </ul> <input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>recognise and describe number patterns</li> <li>recognise and describe number relationships including multiple, factor and square</li> <li>use place value to multiply and divide whole numbers by 10 or 100</li> <li>recognise approximate proportions of a whole and use simple fractions and percentages to describe these</li> <li>order decimals to three decimal places</li> <li>begin to understand simple ratio</li> </ul> <input type="checkbox"/>	<ul style="list-style-type: none"> <li>use a range of mental methods of computation with all operations</li> <li>recall multiplication facts up to <math>10 \times 10</math> and quickly derive corresponding division facts</li> <li>use efficient written methods of addition and subtraction and of short multiplication and division</li> <li>multiply a simple decimal by a single digit</li> <li>solve problems with or without a calculator</li> <li>check the reasonableness of results with reference to the context or size of numbers</li> </ul> <input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>begin to use simple formulae expressed in words</li> <li>use and interpret coordinates in the first quadrant</li> </ul> <input type="checkbox"/>	<ul style="list-style-type: none"> <li>use the properties of 2-D and 3-D shapes</li> <li>make 3-D models by linking given faces or edges and draw common 2-D shapes in different orientations on grids</li> <li>reflect simple shapes in a mirror line, translate shapes horizontally or vertically and begin to rotate a simple shape or object about its centre or a vertex</li> <li>choose and use appropriate units and instruments</li> <li>interpret, with appropriate accuracy, numbers on a range of measuring instruments</li> <li>find perimeters of simple shapes and find areas by counting squares</li> </ul> <input type="checkbox"/>	<ul style="list-style-type: none"> <li>collect and record discrete data</li> <li>group data, where appropriate, in equal class intervals</li> <li>continue to use Venn and Carroll diagrams to record their sorting and classifying of information</li> <li>construct and interpret frequency diagrams and simple line graphs</li> <li>understand and use the mode and range to describe sets of data</li> </ul> <input checked="" type="checkbox"/>
<b>BL</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Key: BL-Below Level IE-Insufficient Evidence

Overall assessment (tick one box only)      Low 5       Secure 4       High 4       Low 5       Secure 5       High 5

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The National Strategies | Secondary  
Assessing pupils' progress at Key Stage 3: Pupil A

## Available mathematics Standards Files

The following Standards Files are available to download from [www.standards.dcsf.gov.uk/secondary/keystage3/subjects/maths/](http://www.standards.dcsf.gov.uk/secondary/keystage3/subjects/maths/).

Year	Overall level	Pupil	Significant attainment targets and levels			
			Ma1	Ma2	Ma3	Ma4
7	High 3	M	3	3	3	3
7	Secure 4	B	4	4	4	4
7	Secure 4	W	4	4	4	4
7	Low 5	A	4	5	5	4
8	Secure 5	C	4	5	5	5
8	Low 6	J	5	6	6	5
8	Secure 6	R	6	6	6	6
9	Secure 7	V	7	7	7	7
9	Low 8	N	7	8	8	8

## Using the Standards Files

The Standards Files enable classroom teachers to have a common understanding of different levels, and the nature and demands of the different strands of mathematics at each level.

There are different ways of using the Standards Files:

- to standardise judgements, i.e. to ensure teachers' judgements are in line with national standards before making assessments;
- as a reference when assessing your own pupils;
- to support moderation activity;
- to clarify what it means to make progress;
- to exemplify the APP approach.

### **Standardisation materials**

To ensure that judgements made by teachers across the mathematics department are in line with national standards and are consistent with each other the mathematics department could work together on some standardisation tasks:

- each teacher assesses one of their own pupils, and agrees their level judgement with a colleague by comparing and contrasting the pupil's work with that of a Standards File pupil at that level
- teachers assess the work of one Standards File pupil using a training version with the references to level judgements removed, and then compare their judgements with those in the full Standards File
- copy one or two collections of work from their own pupils, without any annotation or commentary, and ask colleagues to identify pupils in the Standards Files to which each is closest in performance
- copy two Standards Files at the same level (e.g. low 6 and secure 6) with all the annotations, but take out the assessment summaries, or assessment guidelines sheets, so that groups can discuss and agree which is low and which is secure.

Subject leaders and others running training sessions with the department could use selected pupil Standards Files, to illustrate how the principles that underpin the APP model of periodic assessment operate in practice, or to illustrate particular aspects of assessment. Discussion could be focused, for example, on:

- attainment at a particular level in different year groups, or in a particular mathematics strand at different levels;
- the range of potential evidence, for example how much evidence of attainment for a particular AF is required to support a judgement;
- differences between evidence gathered from oral work and writing;
- whether it is harder to find evidence for some strands than others;
- identifying the next steps in teaching and learning for a particular pupil, or groups of pupils.

### **Reference**

When mathematics teachers are assessing their own pupils they can use the Standards Files for reference:

- as a benchmark when making periodic assessments;
- to compare the performance of pupils at a particular level with exemplars that have been assessed against national standards;
- to check what constitutes sufficient evidence of attainment in a strand at a specific level;
- to refine judgement of what is typical of performance in adjacent levels, for example comparing two collections of work in the same attainment target, one on either side of a level borderline;
- to check what progression in a particular AF looks like.

### **Supporting in-school moderation**

Moderation activity generally involves a group of teachers reviewing a sample of class teachers' initial assessments, reconciling any disagreements and agreeing a final judgement. The Standards Files are essential tools in this process of bringing differing views to agreement in an evidence-based way that is in line with national standards. Disagreement can be resolved by recourse to the question: *How does the pupil under discussion compare with pupil X or Y from the Standards Files?*

Audience: Secondary mathematics subject leaders

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