

Intervention in mathematics

Introduction

Your vision for planning and teaching will apply to all classes and groups of pupils, and to each individual pupil. Only occasionally are the needs of individual pupils or groups of pupils so distinct that entirely different approaches are needed in order to help them learn mathematics and engage fully in lessons. In these instances, specialist guidance more detailed than that given in this short introduction will be needed.

In the main, you will adapt existing planning and teaching principles in order to include all pupils. This section responds to two considerations about planning and teaching mathematics:

- What is the best way to support the mathematical progress of pupils who have particular needs? For example, pupils learning English as an additional language or those with special educational needs, learning difficulties or disabilities.
- What are the most effective actions to take if any individual pupil or groups of pupils are not making expected progress?

In most cases the suggestions on the following pages involve adjusting existing practice rather than doing something new. For example:

- If you believe that pupils need to work together and to talk about their mathematics, the task is now to facilitate this collaboration more strategically for a pupil with emotional difficulties or a pupil who is not yet fluent in English.
- If you are working to develop a more open questioning style which allows pupils time to think, the task is now to choose questions so that pupils with misconceptions have them revealed and addressed.

The guidance that follows is based on strategies which have been tried and tested in the classroom. Each section includes references to further Strategy resources which will provide more background detail and more practical support.

You will notice that all entries in this section recommend keeping expectations high. Where expectations are high and teaching reflects this, most pupils, whatever their starting point, can aim for two levels of progress during Key Stage 3. For example:

- design lessons so that all pupils are included in ways which enhance their progress (see 'Inclusive teaching in mathematics')
- aim to keep an accurate picture of pupils' progress towards their targets (see 'Assessment and target-setting')
- when underperformance is identified, make a swift and strategic response (see below).

A fair 'rule of thumb' is to:

- know the pupils well
 - What can they already do mathematically?
 - What helps them learn effectively?

- know the mathematics well
 - What is needed to tackle the tasks?
 - What connections can be made?
 - What is this leading to?
- respond to the learning
 - How effective is the learning in these lessons?
 - Is the pace appropriate?

Intervention

The yearly teaching programmes and schemes of work based upon these are designed to provide for appropriate pace and progression in learning for the majority of pupils. Inevitably, some pupils working at expected levels generally will experience particular difficulties with aspects of the curriculum from time to time. Teachers will need to adjust their teaching plans to deal with these as the needs arise. The extent of adaptation and scale of intervention will vary accordingly. Where there are additional adults deployed to a class, the teacher will need to take this into account when planning lessons and sequences of lessons.

Similarly, in most schools, groups of pupils will be working below expectations across the subject. For these, long- and medium-term teaching plans need to be adjusted to accommodate the lower starting point whilst promoting steady and, where possible, accelerated progress.

The top priority for most schools is to identify and provide appropriate intervention for a target group who:

- are below the level expected for their age, and
- have the potential to reach the expected level.

Intervention implies that these pupils will receive some additional or different provision at certain times, but effective intervention requires that the needs of these pupils are also met through tailored teaching in main lessons.

A systematic approach to teaching based on three 'Waves' of tailored support is recommended for supporting the needs of these pupils. Departments can use a 'Waves' approach to plan, design and tailor effective and appropriate intervention provision.

Tailored teaching in classes (Wave 1)

Wave 1 provision is high quality, inclusive teaching, clearly targeted on all pupils' needs and prior learning. This should be based on planning and schemes of work that are designed to help all pupils to move from where they are to where they need to be. It may involve working closely with an additional adult in both planning and teaching. Where there are large numbers of pupils that share the same learning needs, the best solution is to adjust the planning to cater for them. It means setting a new trajectory for the learning programme to take pupils to where they need to be in terms of age-related expectations. Effective Wave 1 teaching anticipates the needs of pupils based on good use of yearly transition data and information. Examples include the teacher responding to the identified needs of a whole class by adapting their planning to address areas of weakness.

This approach could be informed by using:

- *Targeting level 4 in Year 7 mathematics*
(<http://www.standards.dfes.gov.uk/secondary/keystage3/all/respub/matl4yr7>)
- Specific elements selected from the range of targeting level 5 in Year 9 materials
(<http://www.standards.dfes.gov.uk/secondary/keystage3/all/respub/matl35>).

Tailored teaching in classes, plus time-limited, tailored intervention support programmes (Wave 2)

Wave 2 provision usually takes the form of a tight, structured programme of small group support, carefully targeted and delivered by teachers or teaching assistants who have the skills to help pupils achieve their learning objectives. This is not in place of the regular mathematics lessons. It can occur outside whole-class lessons, or be built into mainstream lessons as part of guided work. Critically, intervention support needs to help pupils apply their learning in mainstream lessons. The outcome of Wave 2 intervention is for pupils to be back on track to meet national expectations at the end of the key stage. One example would be analysing test items and identifying a particular group who have specific difficulties in common. This could result, for example, in planned intervention for a small group of pupils experiencing difficulty in calculating and estimating the area of shapes through:

- a teaching assistant working with the group in the class using relevant resources from *Targeting level 4 in Year 7 mathematics*, or
- the teacher providing additional sessions using a practical approach and dynamic ICT images to retrieve and secure understanding of the concept of area.

Tailored teaching in classes, plus increasingly individualised programmes based on independent evidence of what works (Wave 3)

Wave 3 provision may involve one-to-one or very small group support via a specialist teacher, highly trained teaching assistant or academic mentor, or other additional adult, to support pupils towards their curricular targets. The aim of Wave 3 intervention is to accelerate and maximise progress and minimise performance gaps for individuals. For this reason it is important to keep targets specific and expectations high. Examples include teachers or teaching assistants working with individuals or pairs of pupils within or outside lessons to target particular, identified, short-term needs. These could include quite fundamental issues such as a weak understanding of place value. Materials to support this approach can be found on the Secondary Intervention website and include:

- *Mathematics challenge* (<http://www.standards.dcsf.gov.uk/intervention/236.html>)
- the *10-4-10* materials (<http://www.standards.dcsf.gov.uk/intervention/242.html>)
- the Wave 3 Primary materials: *Supporting children with gaps in their mathematical understanding* (<http://www.standards.dcsf.gov.uk/intervention/252.html>).

It is important to note that the 'Waves' signify types of provision and not categories of children. The need for interventions will be much reduced when high quality teaching is matched well to the different but developing abilities and needs of pupils. The prime purpose of intervention programmes and support, therefore, is not to shore up weak mainstream teaching but to provide

a useful model through which to support efficient curriculum planning, inclusive teaching and personalised approaches to address diverse needs.

Making the best use of additional support in the classroom

In effective schools it is common for additional adults to be assigned to a particular department rather than to individual pupils. Where additional adults are attached to a subject, they have greater opportunity to become part of the department's information flow and training. They are also more likely to be familiar with curricular targets and to understand the next steps in learning. Make best use of such adults by guiding them to:

- help ensure that pupils with SEN and/or disabilities, as well as other pupils, are actively included in lessons and benefit from learning alongside their peers
- teach small groups of pupils using Wave 2 type interventions
- teach individual pupils using Wave 3 type interventions
- produce resources designed to improve access and inclusion of pupils
- use the progression maps to support pupils in understanding curricular targets.

Since adult support in the classroom is more effective when it is well informed, consider:

- sharing copies of the schemes of work, curricular targets and any specifically targeted intervention materials with additional adults
- involving them in planning lessons and in producing and adapting materials required for specific groups or individuals
- briefing them about their role in the lesson, being clear about lesson objectives and exactly how they can support pupils in making progress
- ensuring that learning outcomes include strategies that enable progress toward maximum independent learning.

The intervention module *MM6 Working with teaching assistants*, available at <http://www.standards.dfes.gov.uk/intervention/199.html>, can be used by teachers to develop their expertise in working with additional adults. It can also be used by subject leaders to judge their department's effectiveness and establish CPD priorities.

Planning an intervention programme

The Secondary National Strategy has developed a wide range of resources and planning tools for intervention. These can be found at <http://www.standards.dfes.gov.uk/intervention>.

Modules *MM2 Tailoring teaching in mathematics* and *MM7 Resources to support planned intervention* are particularly useful online modules, but it is suggested that teachers explore all of the units on the website.

The progression maps are designed to support teachers with intervention programmes. They exemplify learning objectives and provide probing questions for judging understanding and ideas for further support where pupils are finding an objective a barrier to learning. See <http://www.standards.dfes.gov.uk/progressionmaps/>.