ACME
Advisory Committee on Mathematics Education

maths Snapshots
DECEMBER 2014

The maths curriculum

A well-designed curriculum is essential for the long-term development of maths confidence and competence. A national curriculum should:

- be designed, reviewed and refined in a gradual and coordinated way by mathematics education experts
- support students' ability to reason mathematically and solve problems
- be assessed in ways that are effective and test all the aims of the curriculum
- be supported by high-quality professional development and resources to support curriculum planning and classroom teaching.

- **Put in place a new model for long-term curriculum development.**
- **Improve national tests and high-stakes assessments in order to assess all of the National Curriculum aims.**
- **Invest in high-quality curriculum resources and professional development.**

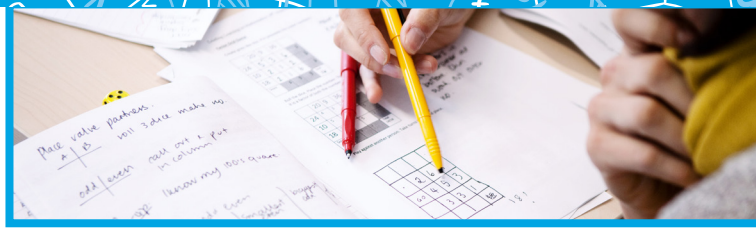
Where are we now?

A national curriculum introduced in 1989 set out the entitlement for all children.

- The National Curriculum for primary and secondary state schools in England and Wales was first introduced in September 1989.
- Since 1989, the maths curriculum has been rewritten several times.
- Between 1997 and 2010 the curriculum was supported by the National Strategies, which included detailed support for teachers and nationally organised professional development.
- Independent schools and certain categories of publicly funded schools in England are not required to follow the National Curriculum.

The most recent version of the curriculum was introduced in September 2014. (1)

- The new National Curriculum aims to develop fluency, mathematical reasoning and problem solving.
- The maths curriculum has increased the expectations for all children and young people; requirements for children in lower primary years are particularly challenging.
- The very welcome emphasis on reasoning and problem solving in the aims needs to be strongly reflected in the material developed for teaching and assessing primary children.
- Key Stage 3 (11-14 year olds) is a critical time in children's maths education, but is only briefly described in the new curriculum.



What are the challenges?

There are difficulties in delivering the new curriculum to improve the experience of all children.

- High-stakes assessment, performance measures and the target culture can get in the way of developing maths skills and thinking. (2)
- The new curriculum offers little guidance on progression in mathematical concepts from year to year and across key stages.
- Rapid curriculum change challenges the creation of high-quality, trialled teaching material, such as textbooks.
- As many schools are not required to follow the maths curriculum, there are questions around the entitlement for all children.

Teachers will find it hard to deliver the new curriculum.

- There is a shortage of subject expertise among teachers of primary and lower secondary school. (3)
- There is a lack of high-quality shared guidance and resources to support teaching for understanding.
- The professional development provision for teachers of maths is patchy and fragmentary, lacking in continuity and consistency. (See **Maths Snapshot: Teachers of maths**.)

What needs to happen?

1. There is a need to develop a broad understanding of core curricular aims amongst teachers, school leaders and governors.

- Classroom experiences of maths should be rich, connected, engaging and challenging.
- If teachers focus on increasing mathematical understanding, as endorsed in the Ofsted School Inspection handbook, this raises attainment and enables students to solve unfamiliar problems. (4)
- Teacher networks, in particular new Maths Hubs, can facilitate the dissemination of good practice in integrating fluency, mathematical reasoning and problem solving into teaching.

2. The production of curriculum resources and professional development opportunities needs to be of high quality and address all the curriculum aims. (5)

- National sponsorship or kite-marking of high-quality curriculum support resources, for example curriculum planning tools or text books, is needed. (6) High-quality textbooks should be aligned to the curriculum, as is the case in many high-performing jurisdictions. (See **Maths Snapshot: international comparisons**.)
- Professional development should ensure that the aspirations of the curriculum can be realised for all learners.

3. There is an urgent need to improve assessment, particularly on problem solving.

- Mathematical problem solving is poorly understood. Improved models of assessment are urgently needed to avoid 'teaching to the test' and to ensure that tests measure maths thinking and understanding. These models should be developed and evaluated carefully by experts involved in developing a holistic maths curriculum across all phases of education.

4. A new model of long-term curriculum development is needed.

- Reviews should be regular, ongoing, informed by trials and over a sufficient time scale, for example every 10 years, in order to ensure stability. (See **Maths Snapshot: Maths education policy**.)
- Curriculum and qualification reform, including of assessment, should be undertaken by a known transparent body of experts that has access to a full range of relevant evidence and expertise.
- These experts would develop high-quality assessment in parallel with curriculum development to ensure coherence.

1: https://www.gov.uk/government/collections/national-curriculum

2: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297595/Primary_Accountability_and_Assessment_Consultation_Response.pdf

3: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335413/sfr11_2014_updated_july.pdf

4: http://www.ofsted.gov.uk/sites/default/files/documents/inspection--forms-and-guides/s/School%20inspection%20handbook.pdf

5: http://www.nuffieldfoundation.org/values-and-variables-mathematics-education-high-performing-countries

6: http://www.cambridgeassessment.org.uk/Images/181744-why-textbooks-count-tim-oates.pdf

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