



National Numeracy
for everyone, for life

nationalnumeracy.org.uk

Manifesto for
a numerate UK

Summary of proposals

Poor numeracy is a massive challenge for the UK and the arguments for change are overwhelming. Here we set out some of the measures that could help to achieve this change.

We know from evidence that people's mathematical understanding and skills can radically improve, if certain barriers are removed. These proposals aim both to transform attitudes and to establish a coherent pathway for numeracy throughout school and beyond. This is not an exhaustive list of what needs doing but it does offer a series of essential steps that should be embarked on after the next general election – if not sooner.

By numeracy, we mean the capacity to use and understand maths in ways that meet the needs of everyday life.

1. A new drive is needed to spread the positive messages that numeracy is a vital life skill, that it can be learnt and that dismissive attitudes are harmful. Backing for this must come from politicians, business, education, the media and individuals, including parents and teachers. Government should support practical projects designed to understand and change public attitudes.

2. Every teacher must become a teacher of numeracy. That does not mean that every teacher becomes a maths teacher but that numeracy – just like literacy – is recognised as an intrinsic part of every subject across the school curriculum.

3. A new measure of numeracy proficiency should be introduced for all young people at the age of 14. This would establish a national benchmark for the level of numeracy needed for further study in all subjects between the ages of 14 and 19.

4. An additional and universally respected qualification in numeracy (or core maths) is needed alongside GCSE maths. Politicians and curriculum and qualification regulators

must give serious and urgent consideration to the introduction of dual GCSEs in maths and numeracy.

5. A new adult numeracy core curriculum is needed. This should put at its centre the very concept of being numerate – that is, being able to use maths to solve everyday problems, make decisions and reason, knowing which maths to use and being ready to persist with different approaches.

6. New forms of adult assessment are required to measure not just the end result but the ‘distance travelled’ by learners – and thus provide evidence of both individual improvement and collective progress across the adult population.

7. More behavioural research is needed into how people – both adults and children – can be encouraged to improve their numeracy skills and how they can develop resilience and persistence. At the same time more evidence is required on the practice of adult numeracy teaching and learning to find out which approaches work best.

Our principles

Numeracy is an essential skill – and an entitlement – for everyone. The economic success of the UK and the wellbeing of people individually are dependent on it.

Everyone can improve their everyday maths skills. Numeracy can be learnt. Mathematical understanding is not determined at birth.

But improvement takes effort and application. The real key to better numeracy skills is determination and resilience. Learning can be hard work for everyone.

Improving numeracy needs encouragement, support and good teaching. The education system, employers and politicians all have a part to play.

Negative attitudes are the foremost barrier to making the UK numerate. Removing them – getting rid of mistaken beliefs and the widespread ‘rubbish at maths’ tag – is fundamental to change.

The case for a numerate UK

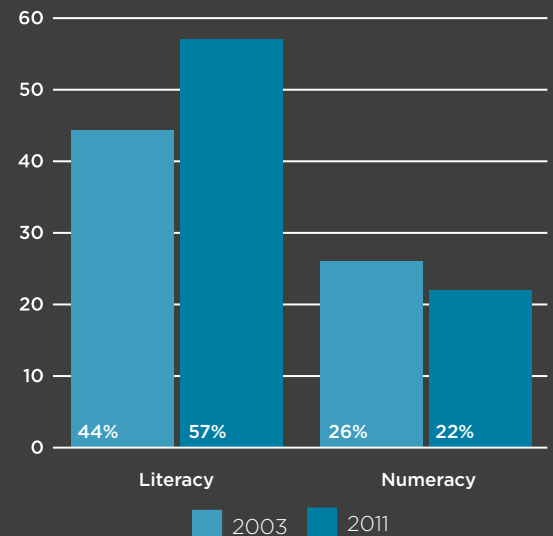
17 million adults in England*
– half the working age population – have the numeracy skills roughly equivalent to those expected of children at primary school

Good numeracy is vital to us all – and vital to the UK. It is essential in every aspect of our lives – at work, in practical everyday activities at home and beyond, as consumers, in managing our finances, as parents helping our children learn, as patients making sense of health information, as citizens understanding the world about us.

Without good everyday maths skills, we are at a disadvantage. Low levels of numeracy and poor number skills are linked to unemployment, low wages and poor health. There is evidence that numeracy is even more closely related to wellbeing and socio-economic achievement than is literacy. It is a key factor in determining success in life.

A comparison between numeracy and literacy skills*

% of the English population with skills roughly equivalent to GCSE A*-C or above



*Department for Business Innovation and Skills, 2012. "Skills for Life Survey 2011". These findings are for England. Other research suggests a somewhat similar picture for other parts of the UK.

We want everyone to have a reasonable level of numeracy, for their own sake and for the sake of the country. It can be done – but there is a big gap to close.

Around half of the adult population have the numeracy levels expected of children at primary school and over three-quarters can't demonstrate skills equivalent to those needed for a decent pass at GCSE. In international surveys, the UK emerges as mediocre in its numeracy performance, lagging behind many other nations, especially on the Pacific Rim.

All of this costs the UK dearly. A 2014 report for National Numeracy from Pro Bono Economics estimated the bill for poor numeracy at around £20 billion a year. That cost is borne jointly by individuals, employers and the public purse.

We know that everyone can improve their everyday maths skills. With effort and support, most people can reach the level they need for all practical purposes. Numeracy can be learnt.

But the greatest constraining factor – and the one that underlies almost every worrying

aspect of the numeracy story – is negative attitudes.

Believing that numeracy doesn't matter or writing yourself or others off as 'no good at maths' is harmful to individuals and to the economy. It blocks improvement – and, in a technology-dependent and increasingly competitive world, the need for improved numeracy is greater than ever.

As a nation we have overlooked the importance of numeracy for too long, often distracted by the understandable demands of literacy. In spite of many strides forward – in research and practice – and initiatives by successive governments, there has been no comprehensive and coherent breakthrough. Poor numeracy remains a national scourge.

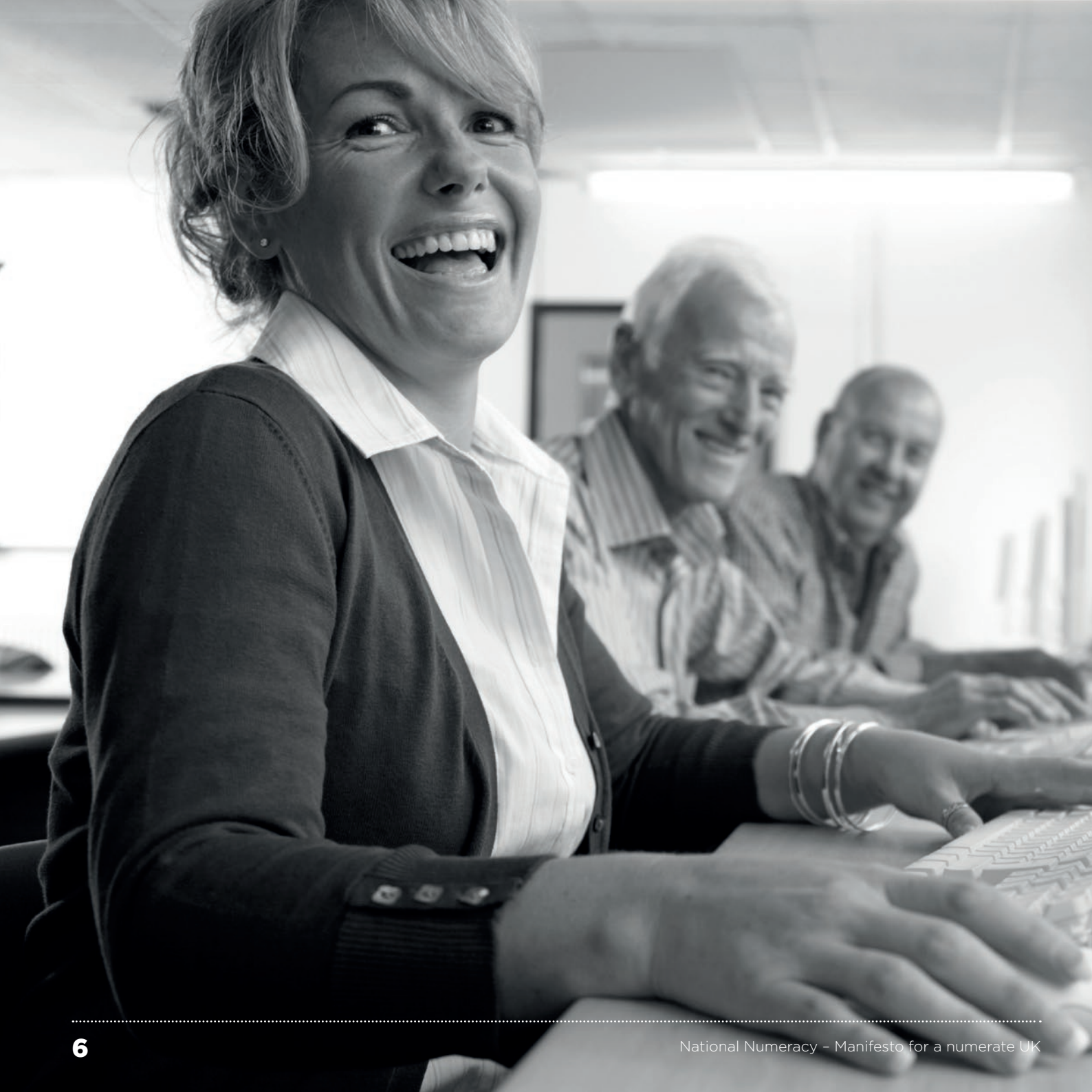
As the next general election draws near, this is one of the biggest educational, economic and social issues facing the UK. Radical change is needed – in attitude, priority and approach – if we are to defeat a very old problem and make the UK numerate.

We believe it can be done – and must be done.

The cost to the UK of low levels of numeracy per year*



*Pro Bono Economics. 2014. "Cost of outcomes associated with low levels of adult numeracy in the UK"



The changes needed

We believe there is a growing awareness of the need to improve the UK's numeracy and a growing demand that 'something must be done'. But that must be transformed into sustainable action if we are to start to see change.

Above all, there has to be a shift in attitudes to maths and numeracy. Measures that do not address this fundamental barrier will not succeed. There also needs to be a new approach to numeracy – and new ways of working – within the education system.

We realise that the numeracy challenge is a long-term problem which is not going to be solved in the life of a single parliament.

But a start must be made and we are now calling on all political parties – and all others with influence in education, business, the public and voluntary sectors – to prioritise numeracy and to

commit themselves to supporting a number of clear measures.

There are of course separate education systems in England, Scotland, Wales and Northern Ireland and the four administrations have followed often very different paths. But each nation faces similar challenges in improving numeracy and we would encourage the four to discuss and compare approaches and to learn from each other.

In the next section we set out proposals for change in three areas.

Value, belief and effort



Attitudes

Numeracy must be taken seriously. That may sound a statement of the obvious but it is also an indication of the radical change in attitude that is needed if the UK is to become fully numerate. The importance of numeracy needs to be understood by everyone and everyone needs to realise that they can become numerate with effort and support.

We want schools, parents, employers, commentators and politicians to back this positive approach – through words and deeds. At the same time we want everyone to understand how damaging negative attitudes can be.

Throw-away remarks about being ‘no good at maths’ are often inaccurate and always insidious. They confuse maths and numeracy and, above all, perpetuate the view that some people are simply not ‘mathematical’ and that this does not matter.

The expression of such views, whether by figures in public life, including the media, by parents, carers or even – very occasionally – by teachers, always needs challenging.

People do not lightly declare that they are ‘no good at reading’. By the same token, no-one should ever quip: ‘I’m no good at maths. It doesn’t matter.’

Recommendation 1

A new drive is needed to spread the positive messages that numeracy is a vital life skill, that it can be learnt and that dismissive attitudes are harmful. Backing for this must come from politicians, business, education, the media and individuals, including parents and teachers. Government should support practical projects designed to understand and change public attitudes.

We ask everyone in positions of influence – in particular those in public life and parents – to think twice before writing off themselves or others as being no good at maths. We suggest furthermore that there is a case for ‘naming and shaming’ prominent figures who are responsible for making thoughtless negative remarks about maths ability.

We think this dual ‘carrot and stick’ approach is needed to create more positive and progressive attitudes. The National Numeracy Challenge is making a start in this, particularly with the support of its Challenge Champions in the workplace and elsewhere. But a national drive to prioritise numeracy and to ensure that the messages are understood across the UK demands comprehensive support from everyone.



STRENGTH IN NUMBERS

The National Numeracy Challenge, introduced by National Numeracy in March 2014, supports adults in reaching a good level of everyday maths, through positive messaging, an online assessment and learning tailored to specific needs. Working with employers and other intermediaries, it aims to improve the skills of a million people over the next five years.

www.nnchallenge.org.uk

Children and young people

Too many children start to fall behind in maths early on and that failure is compounded over the years. Very many young people (and survey data suggests that it is the majority) leave school without the numeracy skills they need for life. The gap between low and high achievers is greater in maths than in any other subject.

This is not a new situation but it is one that successive governments have failed to resolve. It remains one of the most pressing problems facing the education system. The poor experience of school maths that many people have is with them for life and is largely responsible for negative attitudes and underachievement among so many adults.

All children therefore need to see maths as something they can learn and something that is relevant to their lives – every aspect of their lives – after school. Whether or not they proceed to higher maths, all children need to develop confident numeracy skills that will serve them well throughout life.

These skills should be based on the 'Essentials of Numeracy for All' (referred to overleaf)

- a model that describes the fundamental mathematical understanding needed by children and adults.

There are of course pockets of excellence in UK school maths education. But these should become the norm rather than the exception and we therefore support the dissemination of good ideas and the scaling-up of good practice. However we suggest three fundamental changes that need to be made across the board.

Recommendation 2

Every teacher must become a teacher of numeracy. That does not mean that every teacher becomes a maths teacher but that numeracy – just like literacy – is recognised as an intrinsic part of every subject across the school curriculum.

This requires every teacher to be confident in their own numeracy and to be able to draw out the numerical and other mathematical data and understanding inherent in any subject. Numeracy should not be confined to maths classes any more than literacy is to English classes and every teacher has a responsibility to be a numeracy champion. Many schools already recognise this and strive to achieve it, but the approach must become universal.

This is particularly important in primary schools where the same teacher will teach subjects across the curriculum and where cross-curricular work is more common – and where students' early attitudes to subjects are formed. But it is also important in secondary schools and colleges where subjects are taught discretely by specialists. There are implications for initial teacher training and continuing professional development, and for the design and interpretation of the school curriculum.

Linked to this is the need to ensure that the mathematical skills children learn are sound and fit for purpose. The school maths curriculum must allow enough time to establish solid understanding of the fundamentals upon which all

else is built and must relate to later real-life needs. Better ways of assessing students' skills must also be developed, so that teaching and learning are not tied to and constrained by ineffectual forms of testing and examination.

Many children switch off from maths during the later years of primary schooling or the early years of secondary education as maths becomes more abstract. As a result, they never develop the practical maths skills they need. Numeracy – the capacity to understand and use maths in everyday life – demands a new place in the core school curriculum and needs to be assessed separately as a core skill.

Recommendation 3

A new measure of numeracy proficiency should be introduced for all young people at the age of 14. This would establish a national benchmark for the level of numeracy needed for further study in all subjects between the ages of 14 and 19.

The qualification system also needs changing to reflect the status of numeracy as an essential skill. Around a third of children (in England) do not achieve a GCSE A*-C pass in maths and those who fail to make

the grade are told to try again. The GCSE qualification is indeed still regarded by many employers and education institutions as a basic requirement.

However it does not guarantee numeracy. In the 2011 Skills for Life survey only 24% of 16-24 year-olds demonstrated numeracy skills at the level deemed equivalent to a GCSE A*-C pass in maths – despite two-thirds of teenagers actually passing maths GCSE at A*-C.

OECD results have also shown the UK to be the only country where young people's numeracy is worse (slightly) than that of the older generation; everywhere else, younger people achieve better results.

There is therefore a disconnect between school maths and the maths for life needed by everyone – and we do not believe that this will be corrected by current revisions to the GCSE in England. These revisions add more weight and content and include more emphasis on functional maths but still do not provide an adequate focus on numeracy as a skill in its own right. Students will also continue to achieve only a single GCSE maths qualification (compared to two qualifications in English and up to three in science).

Recommendation 4

An additional and universally respected qualification in numeracy (or core maths) is needed alongside GCSE maths. Politicians and curriculum and qualification regulators must give serious and urgent consideration to the introduction of dual GCSEs in maths and numeracy.

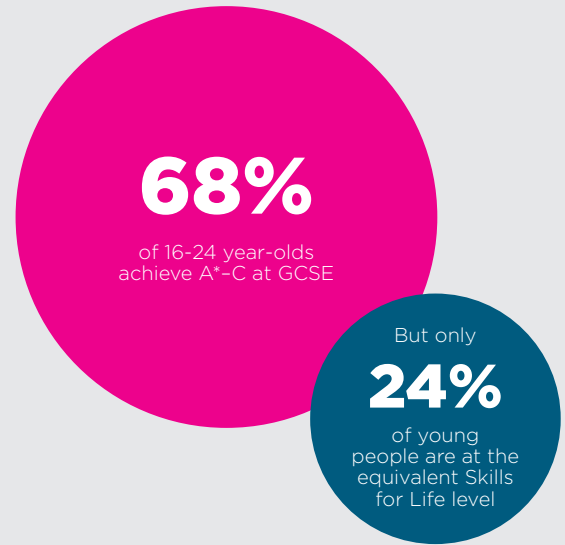
We would expect most children to take both GCSEs and all to take at least the new numeracy (or core maths) GCSE. It would be recognised by students, schools, employers and further and higher education as different from, but no less valuable than, GCSE maths. It would also support the belief that mathematical skills and understanding are important for further study and work and are worth a double qualification. This would contribute towards changing attitudes, raising overall attainment, increasing young people's employability and starting to create a numerate UK.

The content, pedagogical approach and even title of an additional GCSE in numeracy or core maths will need to be worked out in detail and with full consultation – as will the form and implementation of a numeracy measure for 14-year-olds. Here we merely propose

the raw ideas, which we regard as essential if all young people are to leave school numerate.

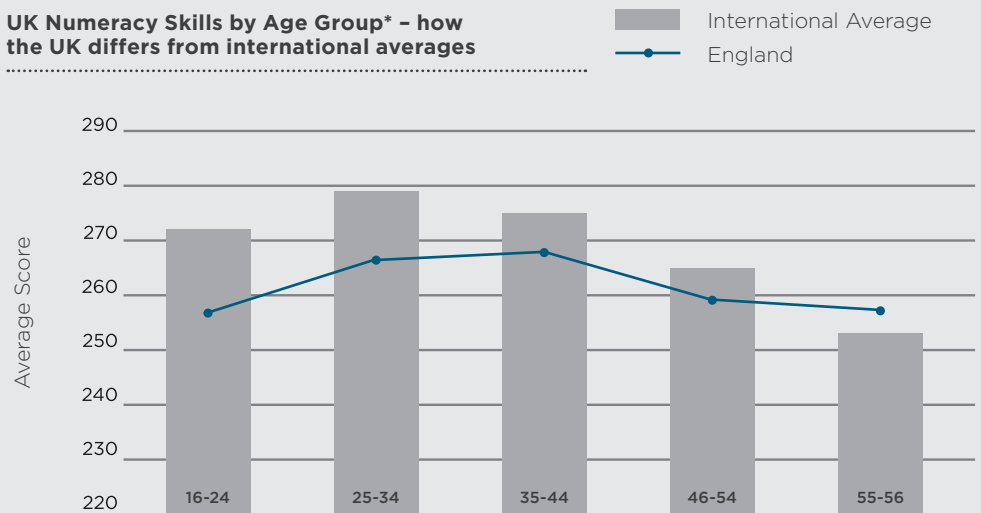
Most of what we say here relates to England and we note that different approaches are being followed in Scotland, Wales and Northern Ireland, with a separate emphasis on numeracy. Again we stress that there are opportunities for the four administrations to learn from each other's approaches and experience. In particular we are encouraged by the introduction of dual maths GCSEs in Wales and believe these new qualifications merit serious consideration in England too.

School maths and adult numeracy*



*Department for Education Statistics. 2012-2013.
Department for Business Innovation and Skills. 2012.
"Skills for Life Survey 2011"

UK Numeracy Skills by Age Group* – how the UK differs from international averages



*OECD. 2013. "Survey of Adult Skills (PIAAC)"

The Essentials of Numeracy for All*



Adults

The changes that we propose in statutory education should in due course reduce the number of adults with poor numeracy. But action is needed more immediately to help the millions of people who currently cope with life and work without adequate everyday maths skills. This is a matter of ‘flow’ and ‘stock’ and we cannot give up on the ‘stock’.

Adult numeracy has over time received much less attention than school maths and as a result there is little evidence of overall improvement in adult skills, even on paper. Formal adult maths or numeracy provision (terminology has varied) has a history of neglect – of being under-valued, under-funded and under-researched. While we welcome all attempts to counter this neglect and recognise that, as with school education, there are pockets of excellence and examples of successful, innovative teaching and valuable research insight, we believe nonetheless that more radical approaches are now needed across the system.

The National Numeracy Challenge, already mentioned, has potential to contribute significantly in this area. But we would like to propose changes in a wider context.

We start with the adult curriculum. The current numeracy core curriculum that most tutors rely on is deficient in design. It delineates the separate mathematical skills that adults need and the processes they must learn but does not relate these to the central goal of ‘being numerate’.

Recommendation 5

A new adult numeracy core curriculum is needed. This should put at its centre the very concept of being numerate – that is, being able to use maths to solve everyday problems, make decisions and reason, knowing which maths to use and being ready to persist with different approaches.

*www.nationalnumeracy.org.uk/essentialsofnumeracy

We propose that this new curriculum is based upon the Essentials of Numeracy, a model developed by National Numeracy in partnership with a group of maths curriculum experts. This comprehensively outlines the different areas of mathematical knowledge and skill that everyone needs for everyday life – but with the overall aim of encouraging numerate behaviour and attitudes. Its principles apply equally to children at schools and to adults improving their skills in either formal or informal settings. We believe that, with support from skilled numeracy tutors, this new curriculum could also improve retention on adult courses.

We also propose changes to the ways in which adult numeracy is assessed and paid for. At present adult learning providers are funded on the basis of qualifications that students achieve. This takes no account of a student's starting point or the progress they have made to attain the qualification.

Recommendation 6

New forms of adult assessment are required to measure not just the end result but the 'distance travelled' by learners – and thus provide evidence of both individual improvement and collective progress across the adult population. We ask politicians and the funding and qualification agencies to consider how this can best be implemented. The National Numeracy Challenge is one approach that allows real progress to be measured through offering and recording assessment before and after learning.

The same perspective could well apply to other forms of learning but it is particularly relevant to numeracy because of the large numbers of people with poor skills who start learning from a very low point.

However for many adults, the idea of returning to any maths learning is anathema and even if learning is resumed, persistence may be hard. This is a challenge across adult learning as a whole but it is particularly so for maths because of attitudes to the subject often acquired at school and because maths may require greater personal resilience.

Recommendation 7

More behavioural research is needed into how people – both adults and children – can be encouraged to improve their numeracy skills and how they can develop resilience and persistence. At the same time more evidence is required on the practice of adult numeracy teaching and learning to find out which approaches work best. We want to see continuing support for the work begun by the Behavioural Insights Team (the 'Nudge Unit' developed in the Cabinet Office) and in which National Numeracy is involved.



Conclusion

“...the numeracy challenge is unique in that it requires a fundamental change in attitude.”

To some extent the issues facing maths and numeracy are the same as those facing English and literacy. Poor skills in both often go hand in hand; both hold people back in life and damage the country's economic prospects. But the numeracy challenge is on a different scale and of a different order.

For too long numeracy has been sidelined and is still often subsumed into literacy. And yet adult numeracy levels are lower than those for literacy and, unlike literacy levels, have shown no signs of improvement in recent years. At the same time, the UK is facing increasing competition from nations whose maths and numeracy skills are rising rapidly.

Moreover the numeracy challenge is unique in that it requires a fundamental change in attitude. Negative ‘can't do maths’ approaches have

beset the UK for too long. We need now to build awareness that being numerate is both important and possible, and we need to increase national and individual determination to stick with it.

We therefore call on all political parties to prioritise numeracy as an education issue in the run-up to the election, to consider our specific proposals and support our call for a drive to make the UK numerate – and to turn promises into action in the following five years.

National Numeracy is an independent charity established in 2012 to help raise low levels of numeracy among adults and children and promote the importance of everyday maths skills. It aims to challenge prevailing attitudes, influence public policy and research and identify and promote effective approaches to improving numeracy. Where possible, it works in partnership with other organisations to achieve these aims.

The ideas in this paper are those of National Numeracy but have been discussed with a range of interested parties including members of the Numeracy Forum, a representative body set up by National Numeracy.

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