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# The Elephant in the Classroom

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WHY MATHS IS AT THE HEART OF 'CHARACTER' DEVELOPMENT

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## The Elephant in the Classroom – Why maths is at the heart of ‘character’ development

**There is a growing awareness of the importance of what is broadly termed ‘character’** – those attitudes and behaviours that underpin success at school and work, characteristics such as resilience, motivation and self-control. Indeed there is a range of data (see Tough, 2012) to suggest that these ‘non-cognitive’ or so-called ‘soft’ skills more accurately predict long-term educational success than does performance in traditional subjects.

At National Numeracy our vision is for everyone in the UK to have the confidence and competence to use numbers and think mathematically in everyday life, something that may appear far removed from notions of ‘character’.

It is also a long way from where we are now in the UK, with 49% of adults having numeracy skills roughly at the level expected at primary school – and 78% unable to demonstrate skills equivalent to those needed for a C grade at GCSE (Skills for Life survey, 2012).

**There is strong evidence to suggest that everyday maths skills are important;** indeed Andreas Schleicher, Director for Education and Skills at the OECD, recently argued that across all the variables they measure in the PISA and PIAAC surveys, “good numeracy is the best protection against unemployment, low wages and poor health”.

Many believe that improving numeracy – what we call everyday maths skills – will be the inevitable by-product of a focus on the specifics of academic maths, culminating (for most) in the GCSE exam. However, as the Skills for Life results show, this supply-side focus on mathematical ‘tablets of stone’ that have seemingly been passed down through the generations is not producing numerate young adults.

Since our launch as an independent charity in 2012, National Numeracy has taken a different demand-side approach; our [Essentials of Numeracy for All](#) embodies the elements that we believe are vital to prepare young people for life in modern Britain, including those noticeably absent from maths curricula here (but present in high-performing countries) – and this is where the link with character comes in...

**Central to ‘The Essentials’**, and we believe relevant to an understanding of ‘character’, is an attitude of mind that involves being willing to persevere, start again, try different approaches - and so develop confidence in solving problems, reasoning and making decisions using quantitative information. This is what young (and older) people really need and yet many maths lessons are not delivering this – as Conrad Wolfram eloquently explains in his [2010 TED talk](#).

**Our contention is that for millions of children and adults across the UK their school maths classroom is, or was, the place where a culturally-perpetuated fixed mindset (Dweck) or ‘talent myth’ (Syed) or lack of resilience or grit (Duckworth) first sets in.**

We believe that this needs to be rigorously challenged and that approaches linked to developing ‘character’ may hold some of the answers.

**School maths in the UK is so often characterised by a starkly binary approach where you are either right or wrong** – and when you are going through this process the question seems either impossible (you haven’t worked it out yet) or easy (you just have!) - which brings to mind Nelson Mandela’s comment that ‘everything seems impossible until it is done’. The psychological challenges and physiological response of these types of questions, which require what Nobel Laureate Daniel Kahneman describes as ‘System 2 thinking’, are expertly explored in his book [‘Thinking Fast and Slow’](#) (2011).

**Inevitably, for very many children there will always be others in the class who seem to get the answer quickly and easily while they themselves are still stuck at the ‘impossible’ stage.** This country’s [obsession with setting and streaming](#) and with trying to categorise by ‘ability’ at a young age (at National Numeracy we prefer to focus on achievement) creates an unhelpful divide between those who are fast at maths at a young age (in itself not a great indicator of future potential - for example Einstein, Professor Ian Stewart and many other eminent mathematicians) and those who aren’t. This obsession is a manifestation of the ‘talent myth’ – the belief that the world is divided into those who can and those who can’t do maths. The social acceptability of saying ‘I can’t do maths’ is an unsurprising outcome.

[Professor Jo Boaler’s research](#) suggests that 85% of children who are put in a bottom set for maths stay there throughout their school career – hardly a recipe for social mobility. Her and our belief is that this is not because they are bad at maths but because they see themselves, and others categorise them, as ‘bad at maths’. It is therefore quite logical for them to focus their efforts on areas that they are ‘good’ or thought to be ‘good’ at.

**We believe that the fundamental systemic error is to categorise current low attainment as some kind of quasi-genetic low ability** – something that high performing jurisdictions do not fall prey to.

## So what can we do about it?

As an introduction spend 90 seconds having a look at [this](#) – and if interested look at the three other clips on the page. The main clip may seem like ‘motherhood and apple pie’ but it represents a major challenge to current cultural beliefs in UK society and the UK education system.

For the detail, the construct that we have found most useful builds upon the work of UK academics Sue Johnston Wilder and Clare Lee around ‘mathematical resilience’.

We focus on three main aspects

- **Value**  
understand the value of maths in everyday life, and the benefits of improving your skills
- **Belief**  
adopt a growth mindset - believe that your maths abilities are not fixed and that you can improve.
- **Effort**  
recognise that all learning takes effort, persevere to reach your goals.

Watch [this video](#) to find out more.

### **We need to dig into the detail of how we can instil each of these elements in learners.**

There is a growing body of research evidence on how this can be achieved within and beyond the maths and numeracy domain.

What is clear however is that together these three aspects are key to the current ‘character’ debate in education – and to improving the UK’s performance in maths and numeracy – because together they provide a route map to instilling a well-founded sense of (mathematical) self-belief.