

# Curriculum resource choice and use in primary mathematics: Different solutions to a universal dilemma

Rachel Marks, Nancy Barclay, and Alison Barnes share some results of their research about how schools make decisions about resourcing their mathematics teaching.

**H**ow should we resource the mathematics curriculum? Which curriculum resources should we use? Should we invest in a scheme? These decisions are made in all primary schools and academy trusts in England. It is by no means a straightforward process, requiring that school leaders, subject leads and teachers grapple with significant complexity in the variety and diversity of curriculum resources available, to select those that best meet the context of their own school(s) and pupils in a manageable – and affordable – way. Strongly held views may also need to be considered. In this article we explore some of the sameness and difference in the pathways primary schools in England take in making these curriculum resourcing decisions. We identify how from the same starting point – how to resource the mathematics curriculum – there exists a diversity of practices underpinned by many similar rationales. We also establish a similar endpoint – in terms of satisfaction – despite differences in the decision paths and solutions found. Along the way we explore some of the factors contributing to the different paths selected and draw out some similarities and differences in practice.

In writing this article we draw on findings from our recent study (Marks, Barclay, and Barnes, 2023) that mapped the landscape of curriculum resource use in mathematics across primary schools in England. ‘Curriculum resource’ refers to the physical and online resources schools and teachers use to structure and deliver lessons, rather than representations such as cubes or bead strings, which were not part of our research. Through a combination of a main survey (sent to mathematics subject leads in all ~17000 mainstream schools educating pupils in the primary-phase in England), a subsidiary survey for primary class teachers administered via Teacher Tapp, and 12 in-depth interviews with primary mathematics subject leads, we have established a picture of curriculum resource use across the country, and importantly explored the whys and hows of use.

## To scheme or not to scheme, that is the first question

A key decision schools must make in resourcing their

mathematics curriculum is whether or not to follow a scheme and, if so, what role that scheme might play. If they follow a scheme, which one do they select? Is it followed to the letter or does it provide a skeleton on which to hang other curriculum resources? How are other schemes and curriculum resources incorporated into the overall provision? If a school chooses not to focus on any particular scheme, how are curriculum resources to be selected and by whom? Already we see where different schools may find different solutions to the same universal dilemma of resourcing the primary mathematics curriculum.

The decision of ‘to scheme or not to scheme’ involves multiple decisions. Schools must consider the format of different schemes (including digital components), the views of all stakeholders (leaders, teachers, and children) about using different types of scheme – including those involving textbooks – the approach advocated by the scheme, for example, mastery, and the associated costs. These final two factors have been particularly pertinent of late following Department for Education (DfE) funding being made available to help eligible schools buy either of the schemes (both including physical textbooks): *Maths – No Problem!* and *Power Maths*.

At this first decision juncture, we find schools splitting almost evenly into those who choose ‘to scheme’ and those who choose ‘not to scheme’:

54% of schools follow a single scheme (wholly or as a skeleton to structure resourcing)

46% of schools have no overarching scheme - curriculum resources are curated from various places

Why might a school fall on either side of the divide? We explore the rationales underpinning decision making in response to the *to scheme or not to scheme* question.

## So ... to scheme?

Schools falling in the 54% - who choose to use a single scheme (of note, <6% of this group exclusively followed a single scheme and drew on no other curriculum resources) – placed value on the quality of the scheme, the availability of supportive,

usually subject-knowledge-focused professional development and the reduction in workload. For eligible schools purchasing *Maths – No Problem!* or *Power Maths* with DfE funding, the availability of such funding was one factor in their decision making. However, peer or organisational recommendation won out here; more schools cited a scheme as having DfE-approval (that is, *Maths – No Problem!* or *Power Maths*) as more important in choosing to use a scheme than the number of schools who cited receiving funding as a factor.

Repeatedly, schools in this group used the same language to rationalise their decision-making: a drive to achieve greater consistency, progression, and coverage. Consistency, allied to progression, was the most cited reason schools gave for using a scheme. It applied to the teachers, pupils, and parents/carers engaged in home learning, but also to lessons, supporting consistency of curriculum content and pedagogic approach, for example, using the same calculation methods and representations:

We needed consistency of approach: children will be exposed to the same models and images throughout school, building on their understanding.

For those schools within the 54% who used one and only one scheme, these rationales were heightened, with some displaying significant satisfaction with, and confidence in, what they had:

It's rock solid, grounded in years of educational research that you just couldn't argue with.

This trust, that the scheme provides the required coverage and progression in a pedagogically sound manner, likely underpins these schools' decisions to use the scheme exclusively, with no additional materials drawn on. For some schools this is accompanied by commitment to significant ongoing teacher CPD to enable all teachers to appreciate the principles that underpin the recommended approaches and activities, contributing to a coherent school-wide approach that those reporting this model felt was positive for pupils and teachers alike.

### Or ... not to scheme?

For the 46% of primary schools who choose not to have an overarching or skeleton scheme, we see a

homogeneous and hence inseparable mix between lived experience and perception in the rationales underpinning decision-making.

Many primary teachers will tell you that there is something particular about what it means to be a primary school teacher. Primary teachers develop strong relationships with the children in a class across subjects over (at least) a year. They value their knowledge of the individuals in their class and as such place import on catering for the unique child:

One size does not fit all!

For schools within the 46% in our survey, the need to cater for the unique child sits at odds with choosing 'to scheme', hence their decision 'not to scheme'. Indeed, we found that in the week of our survey, 33% of class teachers had created mathematics curriculum resources from scratch for their classes. This desire for the creativity and autonomy in selecting and developing activities is deeply embedded in the essence of being a primary teacher.

Central to decision-making for a substantial number of the 46% was the rejection of the prescription perceived to come with a scheme, and the subsequent threat to teacher autonomy:

We want to be teaching, rather than reading from a script.

This is unsurprising. A brief foray into the history of curriculum resource use – particularly that of schemes and textbooks – in primary mathematics reveals a deep scepticism and 'loathing' by some (Gear, 2022) of textbook teaching, a belief that has remained essentially the same for decades. In England, the use of textbooks in primary mathematics has been, and is, amongst the lowest internationally. Low take-up may well have been maintained by current teachers' recall of earlier textbook iterations – including those they may have encountered as children at school – variously evaluated as poor quality (certainly relative to other countries), unstructured, simple, and routine, with a focus on procedural repetition rather than creativity or exploration. Previous research tells us that there is a fear that using rigid schemes – and particularly those involving textbooks – could reduce the role of the teacher to that of a 'technician' (Boyd and Ash, 2018). Perhaps the key here is to support

teachers in identifying rich, high-quality curriculum resources underpinned by sound pedagogic theory. But herein lies the rub; schools and teachers are faced with so many curriculum resources to choose from that this choice may itself be problematic.

### The challenge of choice

We identified a grand total of 107 different curriculum resources currently in use across primary schools in England. We know that further curriculum resources have come to the market since our survey ended. This is a staggering and bewildering quantity. How do teachers and schools choose from such a wide range of different materials, especially when the diversity in content, style, approach, and presentation makes comparison so difficult? Teachers will be familiar with the diversity of the market ranging from resource banks to whole curriculum schemes, from free resources to full subscription models, from purely online to entirely hard copy, all with many variants in between. As if this diversity and range wasn't enough of a challenge to making the most appropriate selection, the question of quality also emerges. How do teachers make decisions on what is a 'good' curriculum resource as opposed to one that is expedient on a busy Sunday evening? Some curriculum resources make claims as to their theoretical grounding and to the coherence of sequencing of ideas and activities they present, but many do not. To provide a coherent curriculum schools will want curriculum resources that are consistent with their principles of sound provision, but making this choice is far from easy.

Of course, each school will not be accessing all 107 curriculum resources; we found that individual schools make use of somewhere between one and 26 different curriculum resources somewhere in their mathematics planning, teaching, learning and assessment activities. Most schools reported use of between five and ten curriculum resources, with the modal number being ten. Underneath this data lies more difference – from schools where each teacher has the autonomy to select and use the curriculum resource of their choice meaning that a teacher in one class may be using a different set of curriculum resources to those in the class next door – to those where an approved selection is agreed (perhaps at a senior leadership level) and used throughout. This brings us back to the issue of sameness and difference; schools are grappling with the vast array of different curriculum resources available yet facing the same concerns of assuring the quality of the curriculum resources available and managing the

workload involved in searching for, evaluating and selecting these.

### The journey continues...

Having decided whether to use a scheme (and if so which one), how closely to follow the scheme, and which other curriculum resources to use, the different pathways schools embark on in their curriculum resourcing journey are far from over. Embedded in many teachers' concerns about using schemes – certainly using them 'off the shelf' – is the view exemplified by one of our respondents that "one size doesn't fit all"; that children and teachers are unique, and that, as such, a unique approach is required. This came across in both our surveys: in line with previous research, most schools take a 'some assembly required' approach to their use of curriculum resources, with just 1% of schools never adapting mathematics curriculum resources and 70% doing so on a more than occasional basis. In just the week of our teacher survey, 36% of primary teachers told us they needed to adapt their mathematics curriculum resources in *every lesson*.

So why are teachers making adaptations to primary mathematics curriculum resources? Overwhelmingly, a driving factor is the need to re-align the material with children's current attainment levels. 92% of schools told us they make adaptations for this reason. Perhaps surprisingly, there was no discernible difference in this figure for schools who have decided to scheme or those who have not; the issue of attainment mismatch is the same across curriculum resources. Looking at other reasons teachers give for making adaptations sheds some light on this extraordinarily high figure. A quarter of respondents told us they need to reduce the language demand, something we have seen before in previous research where some children became frustrated and shut down when faced with the language demands in some mathematics texts. In line with this, we found that teachers using schemes which included physical textbooks are significantly more likely to need to reduce the language demands than those whose curriculum resourcing approach does not involve textbooks.

In understanding adaptations, an important factor is the sizable number of teachers using mixed-age teaching. While in many cases this is related to school size, schools employ mixed-age teaching for various reasons and review and reorganise classes regularly. While some such arrangements fall into the neat mixed-age categories that *some* publishers cater for (Years 1 and 2, Years 3 and 4, Years 5

and 6) many do not and, in any case, the publishers making any concession here are in the minority. The issues arising from mixed-age teaching in relation to curriculum resource use in primary mathematics go far beyond adaptation, cropping up across our data.

### The cost of contentment?

We can see that the choices involved in selecting and using curriculum resources in primary mathematics are anything but simple or easy. Along the way, schools, school leaders, and teachers are faced with longer- and short-term decisions that may impact on children's mathematical learning in unknown ways. There are multiple directions they might take and multiple forks in the road. So where does this journey take or leave schools?

Whatever pathway they take, choices made along the way appear to be carefully planned, with schools able to rationalise their decision-making. At the end of this long chain of decision-making, schools reach a place with which they are content: just 8% of schools told us they are looking to make any changes to their curriculum resource selection in the coming academic year. Even within these schools, 'changes'

sometimes boiled down not to actual curriculum resource changes but to being able to provide individual children with workbooks or increasing online subscriptions.

But this contentment comes at a cost. As we have seen across this article, resourcing the primary mathematics curriculum is a difficult, lengthy process. The nature and mode of use of many curriculum resources, far from reducing workload, increases it. While teachers clearly articulate contentment that they are doing the right thing for the children in their care, and while they are confident that the – often adapted – range of materials they use respond to the needs of their children, the inordinate hours spend curating, creating, and adapting to reach this point of contentment cannot be ignored.

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