

Curriculum and Assessment Review

MEI's response to the Call for Evidence

November 2024

General views on curriculum, assessment, and qualifications pathways

10. *What aspects of the current a) curriculum, b) assessment system and c) qualification pathways are working well to support and recognise educational progress for children and young people?*

We consider that national curriculum content in maths is working reasonably well and supports progression in the subject. We do not consider there is a need to change maths curriculum content significantly, but there is scope for modernisation in relation to data and computing (see question 11) and a need for other changes, particularly in primary maths (see questions 16 and 17).

If mastered, Key Stage 4 mathematics content provides a secure basis for students' varied next steps, and the breadth of post-GCSE maths qualifications serves important functions and should be preserved.

Curriculum

At primary level, there is evidence from Ofsted (Coordinating Mathematical Success 2023) and international tests (TIMSS) that mathematical understanding is improving.

Where mastered (i.e. a deep, connected and secure understanding), the GCSE Maths Foundation tier curriculum provides an essential preparation in maths for work and life, and equips students for further studies that require the application of maths, including Core Maths.

Assessment system

At KS4, GCSE Maths provides a good preparation for A level Maths for students who achieve at least grade 7, but there are weaknesses in GCSE Maths assessment (see question 11).

Grade boundaries for Core Maths qualifications are higher than those for GCSE and A level Maths – students typically need at least 40% to receive a grade. This is a positive feature of the assessment and ensures that students have a sound understanding of course content.

Qualification pathways

Individuals with A level Maths earn on average 11% higher wages in their early thirties than those who take A levels without maths, regardless of the degree they study (Noyes & Adkins, 2017); Labour market returns are relatively high for STEM graduates (Social Mobility Commission, 2023: Labour market value of HE and FE qualifications); and mathematical sciences contribute substantially to the UK economy (Academy for the Mathematical Sciences, 2024: Quantifying the UK economic contribution of the mathematical sciences in 2023).

More students than ever are taking A level Maths, which is a great success. It is important that changes as a result of this review sustain and build on overall numbers of students taking the qualification.

Similarly, participation in Further Maths A level is increasing. Further Maths is often taken as a fourth A level and a qualification for entry to certain STEM degrees – again, it is crucial that future reform does not have an unintended consequence of putting it at risk.

Core Maths qualifications are an important qualification pathway post-16. Quantitative and mathematical reasoning and use of data are increasingly important skills for citizenship, post-16 and degree study, and work and professional roles and Core Maths provides a good foundation for pathways that do not require A level Maths.

11. *What aspects of the current a) curriculum, b) assessment system and c) qualification pathways should be targeted for improvements to better support and recognise educational progress for children and young people?*

We very much welcome that this review is looking at curriculum, assessment and qualifications pathways together. We believe that for maths there are a set of issues which may require deeper consideration by a maths specialist group or organisation to get into the detail and balance differing demands.

Whilst we are broadly happy with maths content at KS1-5, we consider that there are some improvements to be made, which we outline below.

Curriculum

The primary mathematics curriculum should be slimmed down to free time for greater depth and consolidation of fundamental concepts – nonetheless still providing stretch for higher-achieving pupils. We suggest that formal calculations with fractions should be moved to KS3. This would achieve the benefit of a more level playing field and greater readiness for secondary study, and avoid repetition of content in year 7 (also see question 16).

We support the Royal Society’s Mathematical Futures call for greater emphasis in the maths curriculum on data, technology and computing, and for students to apply mathematical and data skills to common, real-world, quantitative problems. As the world rapidly adopts data-driven technologies, it is essential that the curriculum evolves to include AI and data science, in suitable ways.

A full review of the curriculum provides a valuable opportunity to examine how data science can be integrated across mathematics and computing. While elements related to data science can be found within mathematics and computing curricula, it is not a distinct area of study or skill set with clear progression.

We believe a coherent data science curriculum could be specified across the two subjects from KS1 to KS5 with relatively small changes to each – a

strand of complementary curriculum elements covering statistics and probability, data analysis, machine learning and AI, with foundational concepts and skills at earlier stages, progressing towards more recognisable data science study at KS5 (possibly new mathematical options).

Some work has already been done to explore curriculum aspects under the Mathematical Futures Programme (Mathematical and data literacy, Smith, C., et al, 2023). MEI and Raspberry Pi Foundation (who are responsible respectively for Oak National Academy curricula and resources in mathematics and computing) are also working together in this area.

The current curriculum is presented as a list of content. It can be difficult for teachers to make connections between topics within and outside of maths and understand the application and use of maths when appropriate. The DfE non-statutory guidance for KS1/KS2 (June 2020) and KS3 (September 2021) is very helpful, but should be extended to KS4 and include more on the use and application of maths.

Assessment system

The assessment of GCSE Maths is in need of reform. Specifically, the assessment of 'essential maths' lacks adequate focus and reliability (see our responses under qualification pathways below, and to question 19).

Qualification pathways

GCSE grades

In addition to indicating whether young people have maths for life and work, GCSE Maths grades act as a gateway to STEM A levels, Core Maths, T levels, many HE courses etc and GCSE Maths has a special place (with GCSE English) in school accountability measures.

We consider that better alignment is needed between the information provided by GCSE Maths grades and how they are interpreted by end users, without putting additional pressure on young people. Charlie Stripp and Carol Knights provide examples of possible structures for GCSE Maths in the

NCETM Director's blog, *Aligning curriculum and assessment reform with teaching for mastery in secondary maths (part 2)*.

The current approach to accrediting achievement in maths at level 2 is also not working well for those learners who do not achieve a GCSE grade 4+ at age 16. We say more about this in section 4.

Core Maths

Core Maths qualifications are valuable for post-16 learners who have achieved grade 4+ in GCSE Maths but who do not need to follow a calculus course – see endorsement from the British Academy and the Royal Society, and T Gill's research at Cambridge Assessment.

School performance tables for 2022–23 show that only 36% of state schools in England with entries for A level Maths in 2022–23 also had entries for Core Maths. We believe that Core Maths should be a curriculum entitlement for students; this could be achieved by requiring all centres with at least 10 entries for A level Maths to also offer Core Maths, combined with provision of free resources and support through the AMSP.

Maths in T-levels

Maths is embedded in T level qualifications. In MEI's experience, this is sometimes not well-designed, with maths expected to be taught without underpinning concepts which are essential to progress.

It is difficult to solve this problem within T-level content. We believe students of T levels would benefit from space to take a Core Maths qualification alongside their T level to learn the maths they need in a coherent way, and as a gateway for their future, whatever they decide to do.

Social justice and inclusion

12. In the current curriculum, assessment system and qualification pathways, are there any barriers to improving attainment, progress, access or participation (class ceilings) for learners experiencing socioeconomic disadvantage?

Maths is particularly affected by the challenges faced in schools with relatively high levels of disadvantage to attract and retain good teachers. Maths teachers are less likely to be experienced and more likely to be non-specialists. Staffing can be fragile and there can be greater reliance on supply teachers.

Helping teachers to understand the curriculum, assessment and qualifications is essential to addressing class ceilings. We recommend clear curriculum guidance to support implementation and promotion of well-designed, detailed curricula and resources such as those provided by Oak National Academy.

13. In the current curriculum, assessment system and qualification pathways are there any barriers to improving attainment, progress, access or participation which may disproportionately impact pupils based on other protected characteristics (e.g. gender, ethnicity)?

Girls progress to A level Maths in lower numbers than boys, despite similar GCSE achievement. Core Maths qualifications on the other hand attract roughly equal numbers of girls and boys. We would like to see more girls progressing to A level Maths (and Further Maths) and into STEM study in HE, but this is difficult to tackle.

In MEI's discussion paper on assessment in mathematics we looked at evidence from Sweden that teacher assessment tends to favour girls whereas exam assessment tends to favour boys. This is reflected in the data in Ofqual Analytics comparing male and female exam results over time in A level Maths. Girls did better when teacher grades were awarded.

When choosing A levels, girls do better on average than boys in most other GCSEs, so have a wider range of choices at A level. The recent OECD report, Mathematics for Life and Work, suggests that increasing the number of post-16 pathways would increase maths take-up, including by girls.

14. *In the current curriculum, assessment system and qualification pathways, are there any barriers in continuing to improve attainment, progress, access or participation for learners with SEND?*

The current structure of GCSE Maths assessment is not fine-grained enough to demonstrate progress made by lower attainers in aspects of essential maths, including those with SEND. We comment on GCSE assessment in our response to question 19, below.

15. *In the current curriculum, assessment system and qualification pathways, are there any enablers that support attainment, progress, access or participation for the groups listed above?*

Disadvantaged pupils who achieve well in maths at KS2 are lost in the maths 'pipeline' because they are less likely to achieve GCSE 7-9 than their peers:

If they do achieve a grade 7-9, they are just as likely as their peers to choose A level Maths and achieve the same grades (XTX Maths Pathways research). Grade 7-9 is, therefore, an enabler of maths progression.

We are keen for curriculum and assessment changes to incentivise teaching to provide access to top grades at GCSE. This is a complex area (and obviously linked to accountability and teaching quality), but we would encourage the review panel to consider how GCSE assessment design might facilitate this.

For students who do not achieve grade 4+ at age 16, we believe that there should always be a second chance for individual learners, and flexibility to change between pathways – for example options at age 17 if they gain the GCSE within a year.

Ensuring an excellent foundation in maths and English

16. To what extent does the content of the national curriculum at primary level (key stages 1 and 2) enable pupils to gain an excellent foundation in a) English and b) maths? Are there ways in which the content could change to better support this aim?

Many primary teachers make links between maths and other subjects – it would be helpful if national curriculum documents or associated guidance, in maths and other subjects, brought out aspects of the use of maths across the curriculum and in children’s world outside of school.

The primary curriculum should be slimmed down to ensure that pupils have a secure understanding of additive and multiplicative reasoning and how this applies in the context of measures, statistics (data) and geometry. Their knowledge of the number system should include fractions and decimals with a focus on their position in the number system rather than on calculation.

In general, there should be more focus on pupils’ reasoning with maths, including geometrical reasoning. Factual knowledge of key addition and multiplication number facts is crucial to support mathematical reasoning, and the aim should be for pupils to leave KS2 able to reason about additive, multiplicative and geometrical concepts in a range of contexts.

Talk rich classrooms support this aim and it would be good to see a focus on Oracy in maths, which continues into KS3. Foundational knowledge and skills for data science education should be included in the KS1/2 curriculum (see our response to question 11) – this may include some aspects of probability incorporated into primary maths, subject to more detailed review.

Calculating with fractions could wait until KS3. Imperial to metric conversions could be covered as part of proportional reasoning in KS3. Roman numerals could be removed and studied in another subject.

17. To what extent do the English and maths primary assessments' support pupils to gain an excellent foundation in these key subjects? Are there any changes you would suggest that would support this aim?

The multiplication tables check in year 4 is a straightforward check that pupils have gained important knowledge. Unfortunately, it is built up as a stressful thing for pupils. It needs to be reinforced as a check not an assessment, and a useful tool for checking how individual pupils are progressing.

The nature of the questions in the KS2 SATs strongly influence classroom practice, but the overall standard is too demanding for many pupils. The threshold for achieving the expected standard in maths was 49% in 2024, which makes for a miserable experience for children. The message that 'achieving half marks in an assessment means you are doing as expected' has adverse effects on pupils' confidence in maths and how they might hope to achieve in future.

The year 6 curriculum is seriously distorted by preparation for SATs, taking the form of narrowing the curriculum with undue focus on maths and English. Time spent on maths is sub-optimal test-paper practice rather than teaching for understanding and a lot of schools focus on coaching for the arithmetic paper at the expense of teaching mathematical thinking.

The pressure on schools due to accountability measures turns into stress on pupils leading up to the tests. Added to the poor experience of the test described in the previous paragraph, many pupils are forming a very negative view of what maths is and whether they can succeed at it.

Whilst we're broadly happy with the primary maths curriculum, we're keen for KS2 assessment to be reformed. We recognise the need for assessments to support accountability and school performance metrics, but would value

¹ These include SATs at the end of key stage 2, the phonics screening check and the multiplication tables check.

moves towards approaches that distort teaching less – possibly short online tests for randomly selected pupils, perhaps at the end of each year.

18. *To what extent does the content of the a) English and b) maths national curriculum at secondary level (key stages 3 and 4) equip pupils with the knowledge and skills they need for life and further study? Are there ways in which the content could change to better support this aim?*

We recommend a sharper focus in KS3 on proportional/multiplicative reasoning, mathematical literacy and the beginnings of statistical literacy. The aim should be for students to acquire a strong understanding of the ratio, proportion and rates of change section of the national curriculum, along with the underpinning number content. This would include the applications of percentages in financial situations. In statistics, describing, comparing and interpreting should be more strongly emphasised.

This might require a reduction in some of the other content. Pupils should be taught to use spreadsheets in computing so that they can use them in maths to support proportional reasoning and develop algebraic thinking.

Maths is a subject which builds on previous knowledge so changes to KS1/2 and KS3 would have a knock on effect at KS4 which would have to be carefully managed. In particular, care must be taken to ensure that KS4 higher tier GCSE remains a good preparation for A level Maths. The algebraic content is particularly important for progression to A level.

Proportional reasoning and statistical interpretation provide a foundation of understanding on which quantitative reasoning, numeracy and Core Maths qualifications build so all students should get a strong understanding of these aspects by age 16 so that Core Maths can be part of 16–18 pathways for increasing numbers of students.

19. *To what extent do the current maths and English qualifications at a) pre-16 and b) 16-19 support pupils and learners to gain, and adequately demonstrate that they have achieved, the skills and knowledge they need? Are there any changes you would suggest that would support these outcomes?*

Pre-16

Students who gain at least grade 7 in GCSE Maths have a good foundation for progression to A level Maths. However, very low grade boundaries for grades 1 and 2 at foundation tier and for grades 4 and 5 at higher tier mean that students who gain these grades are likely to lack confidence in using maths and have patchy understanding, which is difficult to build on.

The structure of assessment in GCSE Maths should support students to demonstrate and gain credit for what they know and can do, and give them confidence to continue building on this.

The content of GCSE Maths is organised in three levels shown in plain, underlined and bold text, with increasing levels of difficulty. This is not reflected in the assessment structure of either Foundation or Higher tier, with 41% of students entering Foundation tier in 2024. The recent OECD report,

Mathematics for Work and Life found that the level of demand of the two tiers is similar (therefore does not reflect differing content levels). This points the need for a lower foundation tier so that students can show positive achievement rather than partial understanding of more, and challenging, content.

There are different possible ways to achieve this. Examples of possible structures are given in the NCETM Director's blog, *Aligning curriculum and assessment reform with teaching for mastery in secondary maths (part 2)*.

16-19

As we stated under question 11, increases in the number of students taking A level Maths and Further Maths are to be welcomed. Any changes made to

these qualifications should be light touch to ensure that they continue to be popular choices at A level.

We do, however, recommend changes to assessment of A level Maths to enable more students to gain skills in working with data using technology, in line with the intentions of current specifications. In particular, the assessment of work with the large data sets associated with A level Maths specifications needs strengthening. In the longer term, an assessment which includes a digital component would be helpful.

As we stated in question 12, all students should have access to Core Maths qualifications, promoted as widely as other new qualifications, notably T Levels.

20. *How can we better support learners who do not achieve level 2 in English and maths by 16 to learn what they need to thrive as citizens in work and life? In particular, do we have the right qualifications at level 2 for these 16–19 learners (including the maths and English study requirement)?*

Students who achieve grade 1 or 2 in GCSE Maths at age 16 may have a patchy understanding of KS4 mathematics, but they have gained a level 1 qualification and therefore progress to level 2.

The options at level 2 are currently to either retake GCSE and aim for a grade 4

(or better) or to take Functional Skills Maths at level 2. Given gaps in understanding of underpinning concepts, students face difficulty making this level of progress in two years. Combined with a sense of failure from 11 years of poor progress in maths, this results in low motivation for many students.

We recommend a new approach to GCSE for these students, offering a twostep qualification. Research and development by MEI in 2019, with funding from the Nuffield Foundation, could be used as a basis for a new post-16 GCSE Maths graded at the national standard and well understood by

employers and education providers. This could be branded as an adult GCSE to distinguish it from the KS4 qualification.

21. *Are there any particular challenges with regard to the English and maths a) curricula and b) assessment for learners in need of additional support (e.g. learners with SEND, socioeconomic disadvantage, English as an additional language (EAL))? Are there any changes you would suggest to overcome these challenges?*

If structure is lacking and links are not made across the maths curriculum, it can become an unmanageable list of different things for pupils to learn and remember. This is true for all pupils but is particularly relevant for those in need of additional support. Oak National Academy curriculum resources for maths have been designed to create coherence and help address these issues

Post-16, Functional Skills qualifications can be particularly challenging for students with EAL or difficulty reading due to the high level of interpretation required to solve problems in contexts which may be unfamiliar. We are keen to move towards an assessment which allows students to demonstrate understanding of maths without the need for advanced reading or interpretation skills.

In the GCSE resit development work cited in our response to question 20 above, we propose there should be a list of contexts for assessment questions and that the list of contexts could be made available in advance so students can become familiar with these contexts. This would benefit all students but particularly those experiencing socioeconomic disadvantage.

Curriculum and qualification content

- 22. Are there particular curriculum or qualifications subjects where:**
- a) there is too much content; not enough content, or content is missing;**
 - b) the content is out-of-date;**
 - c) the content is unhelpfully sequenced (for example to support good curriculum design or pedagogy);**
 - d) there is a need for greater flexibility (for example to provide the space for teachers to develop and adapt content)?**

As we have stated above, GCSE Maths would benefit from slimming down of content, particularly at Foundation Tier.

- 23. Are there particular changes that could be made to ensure the curriculum (including qualification content) is more diverse and representative of society?**
- 24. To what extent does the current curriculum (including qualification content) support students to positively engage with, be knowledgeable about and respect others? Are there elements that could be improved?**
- 25. In which ways does the current primary curriculum support pupils to have the skills and knowledge they need for life and further study and what could we change to better support this?**

For maths, we recommend guidance and resources to support curriculum progression in data science. (see our response to question 11).

- 26. In which ways do the current secondary curriculum and qualification pathways support pupils to have the skills and knowledge they need for future study, life and work and what could we change to better support this?**

Please see our response to question 19 above.

27. *In which ways do the current qualification pathways and content at 16–19 support pupils to have the skills and knowledge they need for future study, life and work and what could we change to better support this?*

Digital tools are used pervasively in maths. Students should be exposed to using technology in maths, in suitable ways, throughout the secondary curriculum, but particularly at A level. Incorporating digital tools in assessment would enable more students to gain skills in using technology in the intended curriculum and so this should be a long-term aim. It is important to ensure that schools and colleges have the equipment they need to ensure successful delivery and that teachers have the training to enable them to teach these aspects with confidence.

As we stated earlier, Further Maths is an important qualification for students progressing to STEM degrees such as Maths and Engineering so it is important that it retains its place in the curriculum and that other reforms don't have the unintended consequence of putting it at risk.

Core Maths qualifications are an important part of qualifications pathways post16, enabling students to develop skills in quantitative reasoning and statistical interpretation. They should become increasingly visible to parents and other stakeholders by having the results published either through JCQ or on gov.uk, in line with A levels and T Levels.

A broad and balanced curriculum

- 28. *To what extent does the current primary curriculum support pupils to study a broad and balanced curriculum? Should anything change to better support this?***
- 29. *To what extent do the current secondary curriculum and qualifications pathways support pupils to study a broad and balanced curriculum? Should anything change to better support this?***
- 30. *To what extent do the current qualifications pathways at 16–19 support learners to study a broad curriculum which gives them the right knowledge and skills to progress? Should anything change to better support this?***
- 31. *To what extent do the current curriculum (at primary and secondary) and qualifications pathways (at secondary and 16–19) ensure that pupils and learners are able to develop creative skills and have access to creative subjects?***

Students can show creativity in solving maths problems; the problem solving aspects of the curriculum allow for this and it would be good to see this creativity more recognised.

- 32. *Do you have any explanations for the trends outlined in the analysis and/or suggestions to address any that might be of concern?***

Assessment and accountability

Primary and national curriculum assessments

- 35. *Is the volume of statutory assessment at key stages 1 and 2 right for the purposes set out above?***

As we stated in question 17, whilst we're broadly happy with the primary maths curriculum, we're keen for KS2 assessment to be reformed. We

recognise the need for assessments to support accountability and school performance metrics, but would value moves towards approaches that distort teaching less – possibly short online tests for randomly selected pupils at the end of each year, or teacher assessment at KS2, moderating this via sampling the work of a selection of pupil.

36. *Are there any changes that could be made to improve efficacy without having a negative impact on pupils' learning or the wider education system?*

If arithmetic papers incorporated an element of reasoning and problem solving as well as calculation, the papers would allow for a truer reflection of pupils as mathematicians.

It would also be useful for secondary schools to have guidance on how to use the available information to inform transition to KS3.

37. *Are there other changes to the statutory assessment system at key stages 1 and 2 that could be made to improve pupils' experience of assessment, without having a negative impact on either pupils' learning or the wider education system?*

The term 'expected standard' carries an implication of pass/fail, which translates into the way in which schools use this language in reports to parents from year 1. This is damaging for pupils and can distort teaching to focus on a particular group.

We think schools should be incentivised to use the detail available in standard scores rather than reference the expected standard when communicating with parents – it adds nothing to the information available about pupils or schools.

38. *What can we do to ensure the assessment system at key stages 1 and 2 works well for all learners, including learners in need of additional support in their education (for example SEND, disadvantage, EAL)?*

Simple and clear systems for allowing certain pupils to be removed from the assessment process or to be supported to engage with assessments in a nonthreatening way.

Secondary assessment

39. *Is the volume of assessment required for GCSEs right for the purposes set out above? Are there any changes that could be made without having a negative impact on either pupils' learning or the wider education system?*

OCR's Striking the Balance report suggests that the volume of assessment is too high at GCSE. GCSE Maths was previously assessed by two slightly longer papers for many years; it should be possible to change from the current three papers to two, even if there were no other changes to the curriculum.

This change is important in the context of internal assessments such as mock and practice examinations - many students are now more assessed than they were under a modular system.

40. *What more can we do to ensure that: a) the assessment requirements for GCSEs capture and support the development of knowledge and skills of every young person; and b) young people's wellbeing is effectively considered when assessments are developed, giving pupils the best chance to show what they can do to support their progression?*

See our comments on assessment of GCSE Maths in our response to question 19.

41. *Are there particular GCSE subjects where changes could be made to the qualification content and/or assessment that would be beneficial for pupils' learning?*

See our comments on assessment of GCSE Maths in our response to question 19.

While pupils are currently not formally assessed at key stage 3, there are concerns and some evidence that some pupils make little progress in key areas at this key stage.

42. *Are there ways in which we could support improvement in pupil progress and outcomes at key stage 3?*

Greater support is needed at KS3 to improve the progress of students facing socio-economic disadvantage, particularly high potential students whose performance in maths dips relative to their peers. MEI is working in nine schools in Birmingham to implement a Maths Progression Programme (funded through the Maths Excellence Programme), which will test a range of interventions including additional curriculum support and teacher professional development. NFER is evaluating the programme.

Schools that have Secondary Mastery Specialists, engage positively with their local maths hubs or who have a positive culture of subject-specific professional development interpret the KS3 curriculum for maths in a way that promotes strong understanding, but this approach is not universal.

43. *Are there ways in which we could support pupils who do not meet the expected standard at key stage 2?*

Information from the SATs should allow for secondary schools to provide targeted support for pupils in year 7, or indeed at the end of year 6. This could be alongside year 7 lessons or in the normal year 7 maths lessons, as the secondary school wishes to organise it.

Qualification pathways 16–19

47. *To what extent does the range of programmes and qualifications on offer at each level meet the needs and aspirations of learners?*

Level 3

As noted earlier, Core Maths qualifications allow a wider range of students to study maths at level 3. Research from Cambridge Assessment shows that the vast majority of students taking AS and A level Maths have at least grade 7 in GCSE Maths but, for Core Maths, over 50% have grade 6 or below at GCSE.

AS Maths and AS Further Maths are also valuable qualifications for many students who do not wish to take full A levels in these subjects but benefit from taking maths at level 3.

Level 2

The opportunity for students to gain level 2 qualifications in maths and English post-16 is welcome but, as noted earlier, the current arrangements do not meet the needs of a high proportion of these students.

Pearson’s Functional Skills blog for September 2024 shows that for students aged 16–18 entering Functional Skills Maths at level 2, only 20% of them passed; this low success rate confirms that there needs to be an alternative approach and potentially an alternative qualification framework for these students.

48. *Are there particular changes that could be made to the following programmes and qualifications and/or their assessment that would be beneficial to learners:*

AS/A level qualifications

As noted earlier, in the long-term, the incorporation of a digital element in the assessment of A level Maths would be beneficial to reflect the changing subject and support progression to higher education study.

T Level and T Level Foundation Year programmes

Other applied or vocational qualifications at level 3

Other applied or vocational qualifications at level 2 and below

49. *How can we improve learners' understanding of how the different programmes and qualifications on offer will prepare them for university, employment (including apprenticeships) and/or further technical study?*

Students who have parents or other family members with a good understanding of the qualifications landscape and progression routes have this information already. To ensure that students from all backgrounds have access to the same opportunities, information must be readily available for teachers so that they can share it with students.

50. *To what extent is there enough scope and flexibility in the system to support learners who may need to change course?*

51. *Are there additional skills, subjects, or experiences that all learners should develop or study during 16–19 education, regardless of their chosen programmes and qualifications, to support them to be prepared for life and work?*

Other issues on which we would welcome views

Transitions

52. *How can the curriculum, assessment and wraparound support better enable transitions between key stages to ensure continuous learning and support attainment?*

We recommend that guidance at the EY-KS1, KS1-KS2 and KS2-3 transitions includes content on effective academic transition as well as pastoral. This should support the development of 'horizon' subject knowledge for teachers in both key stages so that they are aware of both what is taught and how it is taught, and ensure that pupils recognise common content through consistent use of language and representations.

There is evidence (see The Mathematics Pipeline report from Nottingham University) that the transition from KS2 to KS3 is not satisfactory in maths. Curriculum guidance documents could exemplify how maths learned in KS2 can be used and applied at KS3 to support consolidation yet avoid repetition.

Information in guidance documents would be especially useful for teachers who only teach maths up to KS2 or 3 and so do not have the perspective of what follows in the curriculum to enable them to understand later progression.

Technology

53. *How could technology be used to improve how we deliver the curriculum, assessment and qualifications in England?*

Technology is integral to the teaching and learning of maths in secondary education, yet its use is variable.

Graph drawing software, spreadsheets, geometry software and programming should be embedded in the appropriate place in the

curriculum. This requires increased curriculum emphasis along with the necessary hardware and PD for teachers.

As noted in earlier responses, the incorporation of a digital element to the assessment of A level Maths would enable many more students to gain valuable digital skills and improve their understanding of working with data. This is already being done in other countries so a first step would be to understand how this is working in other jurisdictions, including how barriers have been overcome.

Further Views

54. Do you have any further views on anything else associated with the Curriculum and Assessment Review not covered in the questions throughout the call for evidence?

One feature of the current system in England is that there is no single body which has a detailed and specialist approach to the relationship between:

- The curriculum (its intent and content)
- Assessment (national curriculum tests and qualifications)
- Accountability (performance measures and inspection frameworks)

The DfE plays the leading role, but curriculum intent and content are not always successfully translated into valid and reliable assessments and qualifications, and biases in curriculum implementation can arise as a result of accountability drivers. This is felt most keenly when the curriculum and qualifications are reformed.

Further to this, consideration of the support needed for teaching and learning has tended to be light touch and left mainly to schools and colleges.

To avoid the mistakes of the last curriculum review, we support the idea of an independent specialist organisation which has responsibility for reviewing

the efficacy of current arrangements, developing new ideas and trialling them and proposing refinements.