Section 1: About you

- Sub-group from the Joint Primary **Association of Teachers of Mathematics** (ATM) and **Mathematical Association** (MA) Group. All 121 members were consulted and invited to contribute.

Section 2: General views on curriculum, assessment and qualifications pathways

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

Curriculum

- Two of the three aims of the current mathematics curriculum are sound: problem solving and reasoning.
- The description of 'mathematics as a creative and highly interconnected discipline' (p.3) that is 'essential to everyday life, critical to science, technology and engineering and necessary for financial literacy' (p.3) is strong and pertinent.

Assessment System

- The dropping of end of Key Stage 1 tests is to be applauded and offers teachers the opportunity to use formative assessment and focus on the meaningful development of number sense.

Q11 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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

Curriculum

- This description of 'mathematics as a creative and highly interconnected discipline' (p.3) that is 'essential to everyday life, critical to science, technology and engineering and necessary for financial literacy' (p.3) is not reflected in the current primary mathematics programme of study (PoS).
- Reasoning and problem solving (two of the three aims) need to be embedded in the PoS for mathematics.
- The mathematics curriculum makes no reference to the part the subject plays across the curriculum and beyond school.
- The lack of attention to pattern, geometry, measure, shape, algebra, statistics and probability has impoverished mathematics as it is currently offered to children aged 5 to 11 years old.

- The heavy focus on number and fluency with 'number facts' and operations has led to an increased emphasis on drill and practice to the detriment of developing deeper understanding of the concepts involved. Fluency with numerical operations can be accomplished by machines: the important thing is for children to develop number sense and to be able to reason about their calculation choices and conclusions. (Back et al, 2013).
- There needs to be stronger coherence between EY and KS1 and KS2 and KS3.

Back, J., Sayers, J. & Andrews, P., (2013), The development of foundational number sense in England and Hungary: A case study comparison
http://cerme8.metu.edu.tr/wgpapers/WG11/WG11_Andrews.pdf

Assessment system

- Removal of the Reception Baseline Assessment (RBA) as a progress measure for primary: The RBA was designed to provide a baseline measure for KS2 National Curriculum (NC) tests , but since it has questionable validity and utility for this purpose (BERA, 2018) it could be removed at a cost saving. (This would also free reception teachers to better understand and meet children's mathematical needs).
- The Multiplication Tables Check needs to be dropped. It distorts the Y4 mathematics curriculum with too much emphasis on rote learning to facilitate rapid recall of multiplication facts at the expense of developing understanding of multiplicative structures. (Borthwick et al, BSRLM 2025, forthcoming; Keating, 2024, in press, forthcoming).
- Reasoning and problem solving (two of the three aims for mathematics) need to be embedded in assessments.
- The current KS2 NC tests comprise three papers, which is excessive. The third paper adds little additional information. As such the tests are poorly designed and not fit for purpose.
- The high stakes nature of the KS2 NC tests distorts the teaching and learning of mathematics in Key Stages 1 and 2. Specifically, the focus on 'age-related expectations' (ARE), which can be achieved without conceptual understanding of the majority of the KS2 content, has led to a reduction in emphasis on reasoning mathematically and problem solving in order to maximise the number of learners achieving at the required standard.
- Dropping all KS2 NC tests and moving towards a more portfolio-based approach for the transition to secondary school would provide more nuanced information about what children know, understand and can do across the mathematics curriculum. With the current testing regime, the focus is inevitably on the measurable outcomes rather than ensuring positive engagement and attitudes towards mathematics, problem solving and mathematical reasoning.
- Consideration should be given to national sampling at the end of KS2, as is used for science. This would allow the government to monitor standards over time, without putting every child and school under inappropriate pressure to perform.

https://atm.org.uk/write/MediaUploads/News/BASELINE_for_ATM_MA_statement_Oct20_FINAL_FINAL.pdf

BERA (2018). A baseline without basis: The validity and utility of the proposed reception baseline assessment in England.https://www.bera.ac.uk/project/mtas#:~:text=A%20baseline%20without%20basis%3A%20The,progress%20that%20those%20pupils.

Borthwick, A., Parkinson, A. & Trundley, R. (2025) Do Children in England, who have the multiplication tables check, make use of their understanding of multiplication more than children in Jersey, who do not have the multiplication tables check? Proceedings of the British Society for Research into Learning Mathematics, forthcoming.

Keating. R. KS2 Mathematics Data Analysis. Presentation at the ATM/MA Joint Primary Group, October 2024, Forthcoming.

Section 3: Social justice and inclusion

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Children from disadvantaged backgrounds are not well served by the current primary mathematics curriculum, as evidenced by the socio-economic attainment gap at KS2.
- The high stakes nature of NC tests for all and associated school accountability, means that too often those children unlikely to attain are 'neglected' and do not get access to the full curriculum.
- There is too much mathematics content, particularly in KS1, which means there is too little time in which to build strong mathematical foundations and positive attitudes to the subject, that will serve as a basis for future development.
- The atomised nature of the mathematics content puts pressure on teachers to achieve 'coverage' with only surface-level understanding; this in turn discourages dwelling on tricky concepts and exploring misconceptions through talk, guaranteeing that those with less secure foundations and gaps in understanding are more likely to fall further behind.
- Effective disciplinary oracy is not established and exemplified as an integral part of the mathematics curriculum, leading to disadvantaged learners having fewer opportunities to learn to talk mathematically and to learn mathematics through that talk.
- Inappropriate content and pedagogy disenfranchise many young learners and widens the attainment gap. In many countries children are not introduced to abstract mathematics and formal arithmetic until the age of six or seven.
- The lack of a play based early curriculum prevents children developing spatial awareness, learning about pattern, structure and relationships and the ability to discuss their ideas.
- The current curriculum is not related to children's everyday experiences and does not encourage them to notice mathematics all around them and develop their ability

to perceive and represent things mathematically through comparing, sorting, naming, ordering and making decisions in meaningful contexts.

Q.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)?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The current curriculum is tokenistic in its acknowledgement of mathematics as a human endeavour, by including Roman Numerals. Mathematics has a rich historical and cultural past that can help children to see it as being of personal and cultural relevance. Different historical approaches to solving problems can provide insight into a wide range of mathematics including number, geometry, pattern and mensuration. It can also help develop an appreciation of the truly global nature of mathematics.
- The current curriculum neglects data literacy (ACME, 2024). Easy access to information and data about all aspects of human life around the globe including social justice and sustainability issues means that critical data literacy is essential for citizenship in modern society. Mathematics education is essential for developing this critical literacy and the skills needed to interrogate, interpret, validate and analyse data whether collected by themselves or others. How can the same data be used to draw very different conclusions? Children are much more likely to engage with a mathematics curriculum that they perceive as relevant to their concerns.

  ACME Mathematics Futures Board (2024), Mathematical Futures Programme
  https://royalsociety.org/news-resources/projects/mathematical-futures/

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The high stakes nature of NC tests for all and associated school accountability, means that too often those children unlikely to attain Age Related Expectations (ARE) are 'neglected'. Many primary classes are 'set' or 'streamed' on the basis of prior or likely attainment. This restricts access to the curriculum for too many learners (including those with SEND, EAL, lower socio-economic status and poor school attendance) making it impossible for them to ever achieve as well as their peers, because they have not had the chance to learn the same material to the same depth.
- Teaching in 'mixed ability' groups is a far more effective way of giving children access to the curriculum and providing them with the opportunity to succeed (Taylor et al,

2015). Encouraging children to discuss with one another and take shared responsibility for learning helps to ensure they all have access and can make progress. There will still be children who need additional support, but this can be provided as and when needed, rather than restricting access from the outset.

Taylor, B., Travers, M., Francis, B., Hodgen, J. & Sumner, C. (2015), *Best Practice in Mixed- Attainment Grouping*. London: Education Endowment Foundation/King's College London. https://discovery.ucl.ac.uk/id/eprint/10117725/1/Taylor_Best%20Practice%20in%20Mixed%20Attainment%20Grouping%20Resource%20Book.pdf

Q15. 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? [e.g. socioeconomically disadvantaged young people, pupils with SEND, pupils who are otherwise vulnerable, and young people with protected characteristics]

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Manipulatives can be used to develop mathematical understanding and this could be seen as an enabler.
- There is little in the current curriculum that enables all learners to succeed and make good progress. Indeed, the current curriculum feels like a race in which only the best and fittest can succeed, everyone else drops by the wayside labelled as a failure. Even amongst those who do 'succeed', they often have weak understanding and a poor attitude towards mathematics. The current curriculum for mathematics wastes too much human capital by valuing procedural 'fluency' over understanding, disciplinary thinking and positive attitudes that enable learners to use their mathematics with confidence in a wide range of situations and circumstances.

Section 4: Ensuring an excellent foundation in maths and English

Q.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? [Please note, we invite views specifically on transitions between key stages in section 9.]

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Curriculum content: The current requirement for coverage of a large amount of atomised content in each year group in Key Stage 1 and 2 prevents many children from gaining an excellent foundation in mathematics. Reduced and rebalanced content, focussing on big ideas and mathematical thinking that is crucial for future success in mathematics, would provide a strong foundation for all children.
- Curriculum balance: Mathematics is an interconnected subject where solving problems requires children to draw upon a broad range of mathematical

knowledge, skills and understanding. This requires a mathematics curriculum that balances algebraic, spatial, statistical, quantitative and proportional (including multiplicative) reasoning so that each are afforded sufficient time for connecting big ideas and applying them in a range of non-routine contexts.

- Curriculum focus: The overloading of the current curriculum with number knowledge and procedural skills prevents children gaining an excellent foundation in mathematics. This leads to the atomisation of the number content, which teachers feel under pressure to test regularly and teach at pace in order to 'cover' all the number content by the end of each year. There is little opportunity for revisiting or connecting parts together.
- Curriculum structure: The current structure of the Key Stage 1 and 2 mathematics curriculum in year group silos creates a linear sequence of mathematics knowledge that has to be moved through at pace, neglecting mathematical thinking. This makes it too easy for children to 'fall behind' and never 'catch up'. This is not consistent with other subjects in the curriculum and militates against teaching mixed age groups.

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

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Multiplication Tables Check (MTC): The Multiplication Tables Check should be dropped - the time pressures and focus on the interaction with a screen leads to too much emphasis on rote learning at the expense of deeper understanding of multiplicative structures, plus a distortion of the Y4 curriculum. (Borthwick et al, BSRLM 2025, forthcoming; Keating, 2024, in press, forthcoming). Many children find the pressure of timed testing presents a blockage to memory that can be a cause of anxiety, which is a particular issue in mathematics education associated with negative attitudes and low confidence and self-efficacy in mathematics.
- Key Stage Two Mathematics National Curriculum Tests (NCTs): The high stakes nature of NCTs significantly impacts mathematics practice in Year 6 but also governs assessment practices throughout Key Stages 1 and 2 as schools try to predict NCT scores for individuals and cohorts of children years in advance of children taking them. These NC tests should be removed and replaced with teacher assessment (supported by Professional Development) and national sampling, in order to monitor national standards.

Borthwick, A., Parkinson, A. & Trundley, R. (2025) Do Children in England, who have the multiplication tables check, make use of their understanding of multiplication more than children in Jersey, who do not have the multiplication tables check? Proceedings of the British Society for Research into Learning Mathematics, forthcoming.

Keating. R. KS2 Mathematics Data Analysis. Presentation at the ATM/MA Joint Primary Group, October 2024, Forthcoming.

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Curriculum structure as a linear sequence of atomised knowledge and procedures: Children who are less experienced in mathematics (from home or pre-school experiences or because they are younger in their cohort) are disadvantaged by a curriculum set out as a linear sequence of facts and procedures from Year 1 to Year 6. Their initial inexperience becomes baked into their mathematics learning as they are never given the chance to learn foundational mathematics concepts as the curriculum moves on at pace, creating and maintaining a 'gap' throughout Key Stage 1 and 2 and beyond.
  A curriculum that extends Reception mathematics content to the end of Year 1 would provide time and space for all children to learn foundational mathematics concepts, narrowing the month of birth and home/pre-school experience differences before moving forwards in the curriculum with their peers. A Year 1 curriculum that challenges all children through story contexts, games and problem solving would deepen understanding of essential concepts providing a solid foundation for future mathematics learning for all children.
- The focus on formal written algorithms for calculation is ineffective, outdated and militates against children developing 'number sense' - a deep understanding of pattern and structure within number, that enables them to choose appropriate strategies for calculation including mental methods as a first resort, estimation and effective use of digital technologies.
- The current assessment regime (MTC and NC tests) encourages practice in school that privileges instrumental understanding as the quickest short-term way to raise pass rates. Children who do not succeed are disproportionately from disadvantaged communities or with SEND, embedding deficit perceptions of these children early in their schooling. Scaled scores with a pass/fail mark in KS2 mathematics NCTs label some children as failures in mathematics, which negatively impacts their confidence and self-belief in mathematics that they take with them to their secondary school mathematics education.
- A focus on reasoning in mathematics (including through talk and use of manipulatives) is needed throughout the mathematics curriculum. This is particularly important for children from homes where fewer mathematical discussions take place. This curriculum focus would support teachers to use more dialogic practice, supporting children's disciplinary oracy skills that are essential for developing mathematical thinking and communication.

Section 5: Curriculum and qualification content

Q.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)? Please provide detail on specific key stages where appropriate. *This includes both qualifications where the government sets content nationally, and anywhere the content is currently set by awarding organisations.

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

The primary mathematics 2014 curriculum has:

- Too much content
- Content is not appropriate to the 21st Century (e.g. emphasis on formal algorithms and rapid recall of number facts at the expense of understanding how number works,)
- an undue focus on arithmetic. For over 70 years, mathematics educators have argued that the root cause of the disparity in educational outcomes is the poor algebraic foundation children get from an arithmetic-focused curriculum. (Mason, 2018, Benson and Thorpe, 2024)
- unhelpfully sequenced content, in particular, too much in KS1
- encouraged an atomised approach to teaching (focus on content and not skills does not support teacher agency or build connected understanding)
- obsolescence built in as it prepares students for a pre-generative AI world of work.

Benson, I. & Thorpe, J. (2022), Thinking with arrows for mathematical thought, Mathematics Teaching 281 *https://atm.org.uk/write/MediaUploads/Journals/MT281/18.pdf*

Benson, I & Thorpe, J (2024) Horizon Mathematics/Informatics: What's the Same? What's Different. https://bit.ly/CTM24Full

Mason, J., (2018), How Early is Too Early for Thinking Algebraically? https://bit.ly/Mason2018

Q.23 Are there particular changes that could be made to ensure the curriculum (including qualification content) is more diverse and representative of society?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Reduce and re-balance the curriculum. There is too much content, particularly in KS1, which means there is too little time in which to build strong mathematical foundations and positive attitudes to the subject, that will serve as a basis for future development.

- The best change would be the removal of the MTC and NC KS2 tests. Children from disadvantaged backgrounds are not well served by the testing regime, as evidenced by the socio-economic attainment gap at KS2; the high stakes nature of NC tests for all and associated school accountability, means that too often those children unlikely to attain are 'neglected' by teachers whose focus is on school performance figures.
- Build a curriculum around big ideas (key mathematical concepts) and their connections to avoid the problems associated with atomisation (teaching mathematical content as discrete unconnected fragments of knowledge).
- Embed disciplinary oracy in the curriculum so that disadvantaged learners have opportunities to learn to talk mathematically and to learn mathematics through that talk.
- Avoid introducing abstract mathematics and formal arithmetic until the age of six or seven, as is the practice in most high-performing countries.
- Strengthen a play-based early curriculum that extends into KS1, so that children develop spatial awareness, learn about pattern, structure and relationships and develop the ability discuss their ideas.
- Relate curriculum content more closely to children's everyday experiences so that they notice mathematics all around them and develop their ability to perceive and represent things mathematically through comparing, sorting, naming, ordering and making decisions in meaningful contexts.
- Strengthen spatial reasoning so that girls and other disadvantaged groups can make better progress in mathematics. Poor progression is linked to a lack of early and proper attention on the development spatial skills (Sarama and Clements, 2009).
- Adopt the key messages from The Royal Society's Mathematics Futures paper (e.g. spatial reasoning and quantitative literacy).
- The curriculum should include (age-appropriate) focus on the history of mathematical ideas and those who have developed and used them so that all learners appreciate the diverse and cross-cultural roots of mathematics as a discipline, allowing more learners to identify with and feel a part of the community of mathematicians.

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The curriculum should include (age-appropriate) focus on the history of mathematical ideas and those who have developed and used them so that all learners appreciate the diverse and cross-cultural roots of mathematics as a discipline, allowing more learners to identify with and feel a part of the community of mathematicians.
- Embed disciplinary oracy in the curriculum so that disadvantaged learners have opportunities to learn to talk mathematically and to learn mathematics through that talk.

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The current primary mathematics curriculum does not support children's development of the skills and knowledge they need for life and further study.
- The focus on formal written algorithms for calculation is ineffective, outdated and militates against children developing 'number sense' - a deep understanding of pattern and structure within number, that enables them to choose appropriate strategies for calculation including mental methods as a first resort, estimation and effective use of digital technologies.
- Reduce and re-balance the curriculum. There is too much content, particularly in KS1, which means there is too little time in which to build strong mathematical foundations and positive attitudes to the subject, that will serve as a basis for future development.
- The best change would be the removal of the MTC and NC KS2 tests. Children from disadvantaged backgrounds are not well served by the testing regime, as evidenced by the socio-economic attainment gap at KS2. The high stakes nature of NC tests for all and associated school accountability, means that too often those children unlikely to attain are 'neglected' by teachers whose focus is on school performance figures.
- Build a curriculum around big ideas (key mathematical concepts, Cane (2017)) and their connections to avoid the problems associated with atomisation.
- Embed disciplinary oracy in the curriculum so that disadvantaged learners have opportunities to learn to talk mathematically and to learn mathematics through that talk.
- Avoid introducing abstract mathematics and formal arithmetic until the age of six or seven, as is the practice in most high-performing countries.
- Strengthen a play-based early curriculum that extends into KS1, so that children develop spatial awareness, learn about pattern, structure and relationships and discuss their ideas.
- Relate curriculum content more closely to children's everyday experiences so that they notice mathematics all around them and develop their ability to perceive and represent things mathematically through comparing, sorting, naming, ordering and making decisions in meaningful contexts.
- Strengthen spatial reasoning so that girls and other disadvantaged groups can make better progress in mathematics. Poor progression is linked to a lack of early and proper attention on the development spatial skills (Sarama & Clements, 2009).
- Adopt the key messages from The Royal Society's Mathematics Futures paper (e.g. spatial reasoning and quantitative literacy).
- The curriculum should include (age-appropriate) focus on the history of mathematical ideas and those that have developed and used them so that all learners appreciate the diverse and cross-cultural roots of mathematics as a discipline, allowing more learners to identify with and feel a part of the community of mathematicians.

Section 6: 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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Curriculum content: The current requirement for coverage of a large amount of atomised content in each year group in Key Stage 1 and 2 prevents many children from gaining an excellent foundation in mathematics. Reduced and rebalanced content, focussing on big ideas and mathematical thinking that is crucial for future success in mathematics, would provide a strong foundation for all children.
- Curriculum balance: Mathematics is an interconnected subject where solving problems requires children to draw upon a broad range of mathematical knowledge, skills and understanding. This requires a mathematics curriculum that balances algebraic, spatial, statistical, quantitative and proportional (including multiplicative) reasoning so that each are afforded sufficient time for connecting big ideas and applying them in a range of non-routine contexts.
- Curriculum focus: The overloading of the current curriculum with number knowledge and procedural skills prevents children gaining an excellent foundation in mathematics. This leads to the atomisation of the number content, which teachers feel under pressure to test regularly and teach at pace in order to 'cover' all the number content by the end of each year. There is little opportunity for revisiting or connecting parts together.
- Curriculum structure: The current structure of the Key Stage 1 and 2 mathematics curriculum in year group silos creates a linear sequence of mathematics knowledge that has to be moved through at pace, neglecting mathematical thinking. This makes it too easy for children to 'fall behind' and never 'catch up'. This is not consistent with other subjects in the curriculum and militates against teaching mixed age groups.
- We need a holistic curriculum that considers learners as individuals who are part of a social world. They are subject to emotions and physical sensations that are integral to their ability and motivation to attend, make meaning and cultivate an awareness of their learning. Strengthen cross-curricular links, e.g. mathematics with PE, science, geography (spatial reasoning) as well as creative subjects such as art, drama, music and DT.

Q31. To what extent does the current primary curriculum ensure that learners are able to develop creative skills and have access to creative subjects?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- We need a holistic curriculum that considers learners as individuals who are part of a social world. They are subject to emotions and physical sensations that are integral to their ability and motivation to attend, make meaning and cultivate an awareness of their learning. Strengthen cross-curricular links, e.g. mathematics with PE, science, geography (spatial reasoning) as well as creative subjects such as art, drama, music and DT.

ACME Mathematics Futures Board (2024), Mathematical Futures Programme https://royalsociety.org/news-resources/projects/mathematical-futures/

Cane, J., (2017), Mathematical Journeys: Our Journey in colour with Cuisenaire rods, Working with the Rods and Why, ATM, https://bit.ly/WhyRods

Sarama, J. & Clements, D.H., (2009), Early Childhood Mathematics Education Research: Learning Trajectories for Young Children. NY & London: Routledge. https://doi.org/10.4324/9780203883785

Section 7: Primary Assessment and accountability

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

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The high stakes nature of the KS2 NC tests distorts the teaching and learning of mathematics in Key Stages 1 and 2. Specifically, the focus on 'age-related expectations' (ARE), which can be achieved without conceptual understanding of the majority of the KS2 content, has led to a reduction in emphasis on reasoning mathematically and problem solving in order to maximise the number of learners achieving the required standard.
- Dropping all KS2 NC tests and moving towards a more portfolio-based approach for the transition to secondary school would provide more nuanced information about what children know, understand and can do across the mathematics curriculum. With the current testing regime, the focus is inevitably on the measurable outcomes rather than ensuring positive engagement and attitudes towards mathematics, problem solving and mathematical reasoning.
- The Multiplication Tables Check needs to be dropped. It distorts the Y4 mathematics curriculum with too much emphasis on rote learning to facilitate rapid recall of multiplication facts at the expense of developing understanding of multiplicative structures. (Borthwick et al, BSRLM 2025, forthcoming; Keating, 2024, in press, forthcoming)

Borthwick, A., Parkinson, A. & Trundley, R. (2025) Do Children in England, who have the multiplication tables check, make use of their understanding of multiplication more than children in Jersey, who do not have the multiplication tables check? Proceedings of the British Society for Research into Learning Mathematics, forthcoming.

Keating. R. KS2 Mathematics Data Analysis. Presentation at the ATM/MA Joint Primary Group, October 2024, Forthcoming.

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Teacher assessment and sampling across schools can provide adequate information about school performance, provided moderation systems are robust. It is unnecessary to test every child through formal tests to gather this information and is counter-productive, as too many individual children are labelled as failures.

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Teacher assessment and sampling across schools can provide adequate information about school performance, provided moderation systems are robust. It is unnecessary to test every child through formal tests to gather this information and is counter-productive, as too many individual children are labelled as failures.

Q.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)?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Teacher assessment and sampling across schools can provide adequate information about school performance, provided moderation systems are robust. It is unnecessary to test every child through formal tests to gather this information and is counter-productive as too many individual children are labelled as failures.

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

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- A more flexible mathematics curriculum would allow crucial foundational understanding to be well established in different ways by teachers, enabling

learners to succeed at their own pace and preventing learners from 'falling behind'.

Q.44 To what extent, and in what ways, does the accountability system influence curriculum and assessment decisions in schools and colleges?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Multiplication Tables Check (MTC): The Multiplication Tables Check distorts the Y4 curriculum with an over emphasis on rote learning at the expense of deeper understanding of multiplicative structures. (Borthwick et al, BSRLM 2025, forthcoming; Keating, 2024, in press, forthcoming). Many children find the pressure of timed testing presents a blockage to memory that can be a cause of anxiety, which is a particular issue in mathematics education associated with negative attitudes and low confidence and self-efficacy in mathematics.
- Key Stage Two Mathematics National Curriculum Tests (NCTs): The high stakes nature of NCTs significantly impacts mathematics practice in Year 6 but also governs assessment practices throughout Key Stages 1 and 2 as schools try to predict NCT scores for individuals and cohorts of children years in advance of children taking them. Many schools 'set' or 'stream' children for mathematics to optimise KS2 results.

Borthwick, A., Parkinson, A. & Trundley, R. (2025) Do Children in England, who have the multiplication tables check, make use of their understanding of multiplication more than children in Jersey, who do not have the multiplication tables check? Proceedings of the British Society for Research into Learning Mathematics, forthcoming.

Keating. R. KS2 Mathematics Data Analysis. Presentation at the ATM/MA Joint Primary Group, October 2024, Forthcoming.

Q.45 How well does the current accountability system support and recognise progress for all pupils and learners? What works well and what could be improved?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- The current accountability system for primary mathematics does not work well for most learners. The nature of the assessment values arithmetic competence over mathematical understanding, problem-solving and reasoning. Even successful learners rarely have good understanding of the primary mathematics curriculum material. Children unlikely to succeed often have restricted access to the curriculum as teachers focus on securing school performance.
- A more flexible curriculum would allow crucial foundational understanding to be well established in different ways by teachers, enabling learners to succeed at their own pace and preventing learners from 'falling behind'.

Q.46 Should there be any changes to the current accountability system in order to better support progress and incentivise inclusion for young people with SEND and/or from socioeconomically disadvantaged backgrounds? If so, what should those changes be?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- Not all children learn at the same rate and in the same way. The current curriculum does not take account of this and only children who achieve age related expectations are recognised as 'successful' (i.e. half marks or better on the KS2 NCTs). All children make progress and develop during their primary education and a more sensitive and respectful system of accountability is needed to recognise this.
- A more flexible curriculum would allow crucial foundational understanding to be well established in different ways by teachers, enabling learners to succeed at their own pace and preventing learners from 'falling behind'.

Section 9: Other issues on which we would welcome views

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

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- In the C21 children need to learn to use digital tools as part of their learning across the curriculum. In mathematics, children should use calculators, spreadsheets, dynamic geometry and computer programming to explore and develop their understanding of mathematics.
- Teachers should make use of digital tools and Apps to enhance children's learning and provide them with opportunities to both teach the computer and learn through feedback

Benson, I. & Cane, J., (2017), Using Haskell with 5-7 year olds, Hello World, https://stanford.io/3IPGCSahttps://stanford.io/3IPGCSa
Fletcher, T. (1983), Notes on Microcomputers and Mathematics in School, Department of Education and Science https://bit.ly/Fletcher83

ATM FPCA Working Group (2023), Response to the Maths Futures Board. https://bit.ly/ATMCTMMFResponse

Q.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?

This is a response from a subgroup of the Primary Group of the Association of Teachers of Mathematics and the Mathematical Association focusing on the curriculum and assessment in primary mathematics.

- We are disappointed the review does not cover early years and would urge the Government to re-consider this. Progression and transition between all ages and stages is vitally important and early years should be part of this discussion. Reception Baseline assessment (RBA) for all children needs to be removed as it distorts children's early learning experience in school.

- Any significant changes in the curriculum need to be supported by substantial professional development for those involved in its implementation.