 EMA subject review – Mathematics at KS1 & KS2

Building an inclusive curriculum

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| Purpose of study – KS1 & KS2 | Implications for BAME and EAL learners |
| Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems.  It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.  A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. | A well-resourced and practical mathematics curriculum should present no significant learning challenges to BAME and learners for whom English is not their first language (EAL). Physical and visual resources need to be employed at all stages of the curriculum to ensure access and challenge for EAL learners.  The aims of the Mathematics POS do present language challenges to EAL learners in terms of mathematical vocabulary and problem-solving language, but these are easily addressed through pre-teaching and consistent teacher modelling. First language and dual language learning and consolidation should be encouraged to recognize existing knowledge and maintain pace and challenge.  Inclusion  BAME and EAL learners generally make good progress in mathematics, but an inclusive curriculum will also recognize diversity and celebrate the communities it serves. To this end, learners will recognize themselves in representations shared and identify with contexts encountered. |
| Aims – KS1 & KS2 | Implications for BAME and EAL learners |
| The national curriculum for mathematics aims to ensure that all pupils:   * become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. * **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language * can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.   Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.  The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils’ understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on. | * Diversity is reflected in the teaching and resourcing of Mathematics and the exemplification of ideas and concepts. Pupils from culturally diverse backgrounds feel included throughout the learning. * Aspects of the learning reflect the heritage and diversity of pupils * Evidence is available to show how the curriculum reflects the diversity and language needs of BAME learners. * Pupils learn a great deal of new vocabulary in KS2 Mathematics which may present sifting challenges for EAL learners trying to discriminate between technical and common language: important vocabulary is identified and consolidated. * Problem-solving language may be unfamiliar to EAL learners or learners more familiar with fact-based systems: questioning and explanatory language should be developed and consolidated through consistent modelling * First language and dual language learning and consolidation is encouraged to recognize existing knowledge and maintain pace and challenge. * BAME learners recognize themselves in representations shared and identify with contexts encountered. |

Questions to support self-evaluation of inclusion in the Mathematics curriculum:

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| **How inclusive is the Mathematics curriculum?** |
| Is the curriculum giving pupils the essential knowledge and skills they need?  (next stage/destinations)   * Do EAL learners have the language tools and vocabulary to access the curriculum? * Do BAME pupils understand that there are no limits to their aspirations? |
| Do pupils know and remember more?   * How does knowledge and recollection compare to non-EAL peers? * Does the knowledge demonstrated by pupils indicate a view that embraces diversity? |
| Is the curriculum cumulative?  (step by step in learning more knowledge)   * Are there any gaps in learning for EAL/BAME pupils? * Do pupils appreciate that Mathematics is multi-ethnic and multi-cultural? Is Mathematics projected as mono-cultural? |
| How well does the subject curriculum fit in with other subjects?   * Are links made to BAME mathematicians, scientists, sports people, artists and musicians? * Are there opportunities for pupils to study in their first/other language? |

Examples of resources that reflect the diversity of the local community and figures:

Bletchley Park: <https://bletchleypark.org.uk/learning/>

Milton Keynes museum: <https://miltonkeynesmuseum.org.uk/sessions/>

African diaspora foundation (Inspirational speakers): <https://www.africandiasporafoundation.org.uk/>

Maths

Access and engagement in mathematics. Supporting EAL learners: (KS3 but relevant for KS2)

<https://www.naldic.org.uk/Resources/NALDIC/Teaching%20and%20Learning/ma_eal.pdf>

General Resources:

BLACK HISTORY – <https://blackhistorystudies.com/> <https://m.facebook.com/blackhistorystudiesltd/?locale2=en_GB> <https://www.bbc.co.uk/news/newsbeat-52939694> <https://clpe.org.uk/library-and-resources/booklists/black-history-booklist> <https://www.blackhistorymonth.org.uk/>

[**The Institute of Race Relations**](http://www.irr.org.uk/resources/materials-on-racism-for-teachers/) has produced a series of booklets about the history of race in Britain.

[**Our Migration Story**](https://www.ourmigrationstory.org.uk/about.html) tells the untold history of migration to the UK since AD43, celebrating the lives and the contribution of migrants to the development of our society. The resources are in a range of formats and include lesson plans.

[**Black and British – A Forgotten History**](https://www.bbc.co.uk/programmes/p0499smp) (BBC, 2016): Historian David Olusoga explores overlooked Black figures from British history. The website supporting the series offers additional resources. Also, his book: Black and British. A Short Essential History.

BAME education <https://libguides.ioe.ac.uk/BAMEresources>

National Archive – BAME histories <https://www.nationalarchives.gov.uk/education/resources/black-asian-and-minority-ethnic-histories/>

History Association – Migration posters (Subscription required) <https://www.history.org.uk/publications/resource/9829/primary-history-pull-out-posters-85>

History Association – Migration to Britain scheme (Subscription required) <https://www.history.org.uk/publications/resource/9818/migration-to-britain-through-time>

DIVERSITY TEXTS: <https://www.letterboxlibrary.com/> - diversity texts with clpe <https://clpe.org.uk/> CLPE reflecting realities research: <https://clpe.org.uk/RR>

<https://www.theguardian.com/childrens-books-site/2014/oct/13/50-best-culturally-diverse-childrens-books>

Refugees and refugee week: [www.Southbankcentre.co.uk](http://www.Southbankcentre.co.uk) - “Imagine the future you want to see”.

Windrush: <https://www.bl.uk/windrush/further-reading>

Black Lives Matter (BBC): <https://www.bbc.co.uk/sounds/play/p08gyw71>

Anti-racism: <https://youtu.be/OLGrD9cGrWO>

Links to EMA Network Diversity and Inclusion seminar – July 2021:

\* Hannah Wilson – [Vision and values: embedding diversity, equity and inclusion in your school](https://www.youtube.com/watch?v=6iMXQ_zVSTI)

\* Bennie Kara –[Diversifying your curriculum](https://www.youtube.com/watch?v=mg5MquP6-PA)

\* Pauline Lyseight-jones and Liz Agbettoh - [Honest conversations on race and the importance of language](https://www.youtube.com/watch?v=vWv3xwpB-MU)

\* Shammi Rahman - [Addressing difficult conversations](https://www.youtube.com/watch?v=J5OZRgN8SQk)

\* Serdar Ferit – [Lyfta and immersive human stories](https://www.youtube.com/watch?v=J5OZRgN8SQk) (Need to scroll through to reach Lyfta presentation)

Above with Urls:

Hannah Wilson <https://www.youtube.com/watch?v=6iMXQ_zVSTI>

Bennie Kara <https://www.youtube.com/watch?v=mg5MquP6-PA>

Pauline Lyseight-jones <https://www.youtube.com/watch?v=vWv3xwpB-MU>

Shammi Rahman – Difficult converations – first part, Lyfta – Moving Stories – second part: <https://www.youtube.com/watch?v=vWv3xwpB-MU> (Also includes EMA Network resources and MAKE presentation)