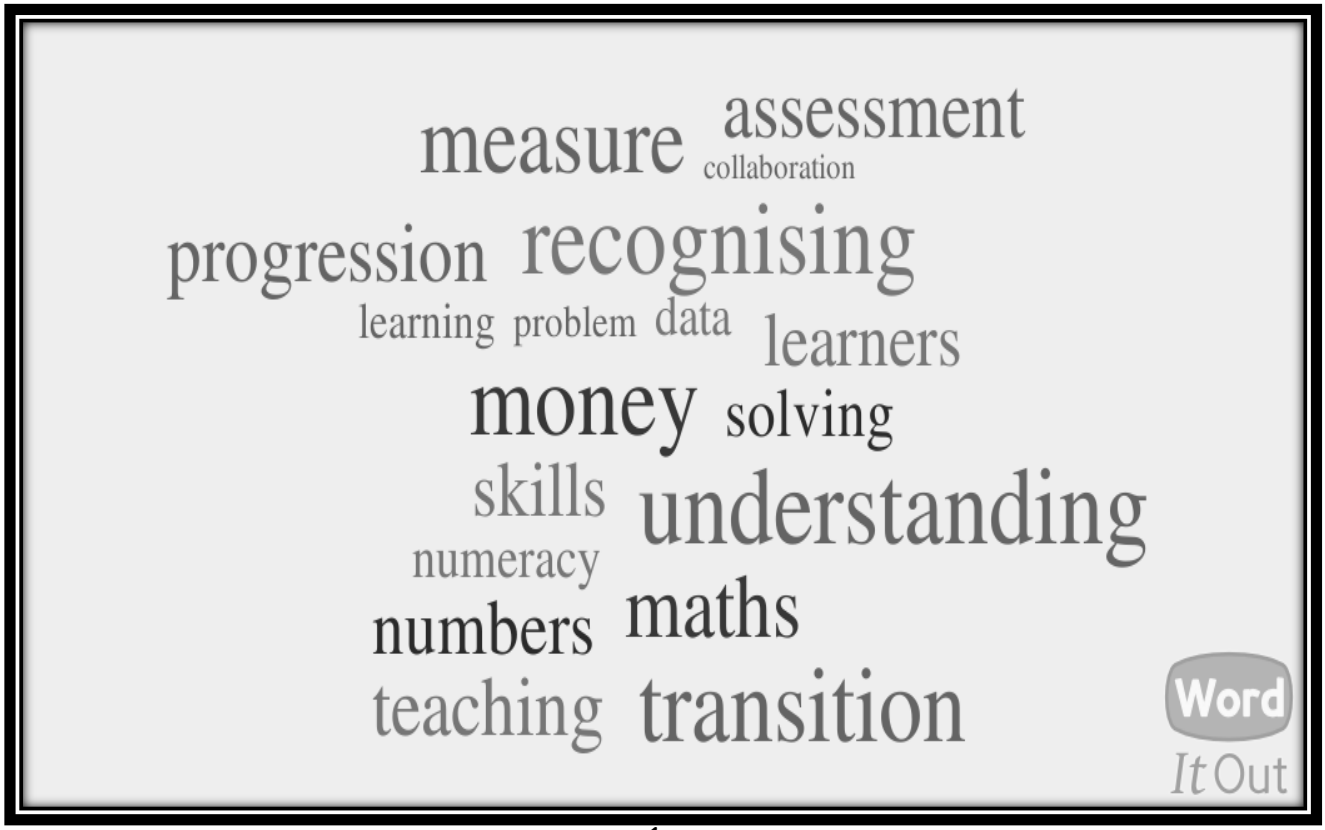
Raising Attainment in East Lothian

Numeracy and Mathematics Strategy

2014-2018



VISION:

To support the Government's vision for Scotland's society and economy and ensure our learners have the mathematical and numeracy skills to function responsibly in everyday life and equip them for lifelong learning.

AIMS:

Numeracy and Mathematics Strategy aims to set the context for raising attainment and improving Numeracy and Mathematics outcomes for all learners through:

- Developing a positive attitude to Numeracy and Mathematics across our whole learning community, fostering high aspirations and an ethos of achievement.
- Ensuring all our learners have access to meaningful learning experiences which enable them to progress their skills in Numeracy and Mathematics.
- Ensuring all our learners are secure in conceptual development of Numeracy and Mathematics skills through a shared understanding of numerical development, for example Stages of Early Arithmetical Learning (SEAL).
- Enabling all our learners to demonstrate confidence in analysing information, solving problems and making informed choices using their skills in Numeracy and Mathematics.
- Supporting all our learners to demonstrate understanding of their progress in Numeracy and Mathematics.
- Providing all our learners with appropriate feedback on how to improve their Numeracy and Mathematics skills, and ensure they are able to set personal targets at all stages of their learning.
- Building staff capacity to develop appropriate skills, knowledge and understanding of Numeracy and Mathematics across all sectors.
- Encouraging active involvement of parents and carers to support learners within Numeracy and Mathematics.
- Ensuring continuity and progression in Numeracy and Mathematics learning through effective transition at each stage.

Numeracy and Mathematics Overview

There are five significant aspects of learning in Numeracy and Mathematics:

- Use knowledge and understanding of the number system, patterns and relationships
- Use knowledge and understanding of measurement and its application
- Use knowledge and understanding of shape and space
- Research and evaluate data to assess risks and make informed choices
- Apply numeracy and mathematical skills.

Numeracy

The confidence and competence in using number which will allow individuals to solve problems, analyse information and make informed decisions based on calculations.
(Numeracy Principles and Practice paper)

Numeracy Across Learning is the responsibility of all. Numeracy is a skill for learning, life and work. Being numerate involves developing an ability and confidence in using numbers that allows us to function responsibly and contribute effectively to society. Good numeracy skills are necessary for successful learning and are essential for life beyond school.

Mathematics

Mathematics equips us with many skills required for life, learning and work. Understanding the part mathematics plays in almost all aspects of life is crucial. This reinforces the need for mathematics to play an integral part in lifelong learning and the richness it brings.
(Mathematics Principles and Practice paper)

Mathematics is important in our everyday life, allowing us to make sense of the world around us and to manage our lives. Using mathematics enables us to model real-life situations and make connections and informed predictions. It equips us with the skills we need to interpret and analyse information, simplify and solve problems, assess risk and make informed decisions.

Mathematics organisers: The mathematics experiences and outcomes are structured within three main organizers, each of which contains a number of subdivisions:

Number, Money and Measure	**Shape, Position and Movement**	**Information Handling**
• Estimation and rounding • Number and number processes • Multiples, factors and primes • Powers and roots • Fractions, decimal fractions and percentages • Money • Time • Measurement • Mathematics – its impact on the world, past, present and future • Patterns and relationships • Expressions and equations	• Properties of 2D shapes and 3D objects • Angle, symmetry and transformation	• Data and analysis • Ideas of chance and uncertainty

Approaches to raising attainment in Numeracy and Mathematics

This strategy has been organised according to the approaches to raising attainment document published by the Scottish Government and Education Scotland in association with ADES:

- Increasing ambition, aspiration and expectations
- Delivering excellent learning and teaching
- Understanding progress
- Developing effective leadership
- Engaging family and the wider community

Increasing ambition, aspiration and expectations in Numeracy and Mathematics

In East Lothian, improving attitudes towards Numeracy and Mathematics is central to improving attainment. Much has been written about negative attitudes learners often have towards Numeracy and Mathematics and the impact that can have well into adulthood. Being "no good at maths" is often accepted without thought and can carry little stigma.

To improve attitudes towards Numeracy and Mathematics our learners should value the skills and see the relevance of these skills for life. Our learners should believe that abilities in Numeracy and Mathematics can be developed through effort and that they are not fixed. They should be able to see mistakes as opportunities to learn and to see challenge as a good thing.

Teachers should set high aspirations for Numeracy and Mathematics and communicate these aspirations with learners, parents/carers and each other.

Delivering excellent learning and teaching in Numeracy and Mathematics

In East Lothian, effective learning and teaching is at the heart of raising achievement and attainment in Numeracy and Mathematics. From the early stages onwards, all our learners should experience success in Numeracy and Mathematics and develop the confidence to take risks, ask questions and explore alternative solutions without fear of being wrong. They should enjoy exploring and applying concepts to understand and solve problems, explaining their thinking and presenting their solutions to others in a variety of ways. At all stages, an emphasis on collaborative learning should encourage our learners to reason logically and creatively through discussion of numerical and mathematical ideas and concepts.

Through their use of effective questioning and discussion, teachers should use misconceptions and wrong answers as opportunities to improve and deepen learners' understanding of numerical and mathematical concepts. A range of learning and teaching approaches to challenge and stimulate our learners should be used to promote enjoyment of Numeracy and Mathematics.

Problem solving should be central to all our learning and teaching. We should regularly encourage all our learners to explore different options: 'what would happen if...?' is the fundamental question for teachers and learners to ask as numerical and mathematical thinking develops.

Understanding progress in Numeracy and Mathematics

Research shows that there are significant differences in children's numerical and mathematical knowledge when they begin school. These differences increase as they progress through school. There is a clear tendency for low attainers in the early years to continue to be low attainers. In order to ensure all our learners make appropriate progress in Numeracy and Mathematics, East Lothian has developed an action

research based approach to professional development to ensure staff have an in depth understanding of how learners acquire numerical and mathematical skills and concepts. This should ensure that staff are able to assess learners' progress with confidence and plan appropriate next steps.

Formative assessment should underpin the learning and teaching of Numeracy and Mathematics to facilitate a rich and meaningful dialogue about progress in learning between staff and learners. Robust tracking and monitoring should be in place to support all our learners' progress and achievement across Broad General Education and into the Senior Phase. Numeracy and Mathematics should be moderated regularly at departmental, school and cluster level in order to share standards and continue to raise expectations. A wide range of evidence should be collected and used when making judgments about learners' progress and there should be evidence of breadth, challenge and application. Dialogue about progress in learning should underpin assessment and moderation activities, particularly at key points of transition. Learners should lead this dialogue about their own learning.

Effective leadership in Numeracy and Mathematics

Effective leadership at all levels is crucial to improving attainment in Numeracy and Mathematics in East Lothian. We should work on the premise that it is everyone's responsibility to raise attainment and that we are all accountable for the progress of each and every learner. Our senior managers in schools should work collaboratively to raise attainment for all at school, cluster and authority level. Many of the methodologies and pedagogical approaches developed in East Lothian have been, and continue to be, led by practitioners. Creating professional learning networks of practitioners should underpin our approach to sustainable improvement in Numeracy and Mathematics through our Numeracy and Mathematics academies, co-operative learning and moderation activities.

We need to ensure that all our learners take a lead in their learning through collaborative learning and teaching approaches, universal support and through school, cluster and authority leadership opportunities.

Engaging family and community in Numeracy and Mathematics

The premise that it is everyone's responsibility to raise attainment in Numeracy and Mathematics should include parents and the wider community. To ensure all our learners get the best start in life and are well-supported in their learning we should develop positive relationships with families to share the positive message about Numeracy and Mathematics, to raise expectations and to build capacity in families to support all our learners.

The local community and local employers should work collaboratively with schools to ensure all our learners see the relevance of Numeracy and Mathematics as a life skill. Schools should develop opportunities to highlight Numeracy and Mathematics through events and programmes involving employers and the local community e.g. World of Work week, Employers Fayres, Financial Education, Fair Trade, and Together We Count.

Additional reading:

http://www.educationscotland.gov.uk/learningteachingandassessment/learningacrossthecurriculum/responsibilityofall/numeracy/principlesandpractice/index.asp

http://www.educationscotland.gov.uk/learningteachingandassessment/curriculumareas/mathematics/principlesandpractice/index.asp

http://www.educationscotland.gov.uk/about/areasofwork/raisingattainment/approaches/index.asp

http://www.nationalnumeracy.org.uk/national-numeracy-challenge/index.html

What do we want?	How are we going to do it?	Impact	Proposed Timescale
Increase ambition, aspiration and expectations in Numeracy and Mathematics			
Raise expectations and improve attitudes towards Numeracy and Mathematics 'It is not ok to say I'm no good at maths …'	Authority • Raise the profile of Numeracy and Mathematics in East Lothian - share vision and expectations • Hold a Numeracy and Mathematics conference - March 2015 • Provide and support opportunities to raise the profile of Numeracy and Mathematics with learners - inter-school challenges, life skills focus e.g. Barclays bank • Develop the Curriculum for Excellence website to share practice in Numeracy and Mathematics and to outline the strategy • Lead 'What you say counts' campaign to raise awareness amongst parents and the wider school community of the importance of positive attitudes towards Numeracy and mathematics.	• Shared understanding of the Numeracy and Mathematics strategy in East Lothian • Sharing of practice • Improved networking • Improved staff engagement in Numeracy and Mathematics opportunities • Improved learner engagement in Numeracy and Mathematics • Clear expectations • More positive attitudes toward Numeracy and mathematics.	2014 onwards 2015 2014 onwards 2015 onwards 2015 onwards

What do we want?	How are we going to do it?	Impact	Proposed Timescale
	Schools • Share Numeracy and Mathematics strategy with all staff and the wider school community as appropriate. • Ensure staff attend and contribute to the Numeracy and Mathematics conference • Develop opportunities in school to improve attitudes towards Numeracy and Mathematics with staff and learners for example through work on 'Mindsets'. • Engage with and develop leadership opportunities for learners to lead Numeracy and Mathematics developments • Engage in the 'What you say counts' campaign widely involving staff, parents, carers and the wider community.	• Shared understanding of the local strategy and how this relates to national guidance. • A greater understanding amongst staff and learners of how to improve attitudes and engagement in Numeracy and Mathematics. • Changing mindsets towards Numeracy and Mathematics.	2014 onwards March 2015 2014 onwards 2014 onwards 2015 onwards
	Staff • Plan and develop opportunities to improve attitudes towards Numeracy and Mathematics • Work to improve expectations • Engage with the Numeracy and Mathematics strategy • Contribute to the Numeracy and Mathematics conference and share practice • Engage with 'What you say counts' campaign	• Changing mindsets towards Numeracy and Mathematics. • Improved confidence and enthusiasm for Numeracy and Mathematics. • Improved expectations and practice.	2014 onwards 2014 onwards 2014 onwards March 2015 2015 onwards

Deliver excellent learning and teaching in Numeracy and Mathematics				
Engage all staff in high quality staff development opportunities to improve understanding of how learners acquire Numeracy and Mathematics skills and to improve learning and teaching	Authority	**Staff development in Stages of Early Arithmetical Learning (SEAL)** • Continue Inter-authority Numeracy Academy approach to support strong practice in numeracy. • Pilot a cluster Numeracy Academy in Musselburgh cluster to build capacity to support this approach at cluster level. • Develop Numeracy Leadership events to support senior managers • Support the development of a cluster approach to the Numeracy Academies. **Staff development to improve pedagogy in mathematics** • Develop an inter-authority mathematics academy to increase confidence in teaching mathematics. • Use action research to pilot approaches and inform development. • Plan strategy for wider engagement • Roll out Mathematics academies from session 2015/16 • Evaluate programme **Staff development for Nursery practitioners to support the development of knowledge and understanding of conceptual development in Numeracy and Mathematics** • Identified practitioner to attend staff development in Midlothian. • Use this opportunity to reflect and then plan appropriate staff development for nursery practitioners in East Lothian. • Use action research to pilot approaches and inform development. • Plan strategy for wider engagement - from session 2015/16. • Roll out Mathematics academies from session 2015/16	• Growing confidence in practitioners to teach numeracy effectively through action research. • Improved learning experiences for learners. • Better identification of learning needs and appropriate strategies to address these. • Learners more secure in number. • Improved pace and challenge. • Deeper understanding of progress in mathematics. • High quality staff development in place.	2014- 2016 2015/16 April 2015 onwards 2015 onwards 2014/15 2014/15 April 2015 August 2015 onwards May 2016 September 2014 April 2015 April 2015 August 2015 onwards

		Staff development to highlight problem-solving and application of Numeracy and Mathematics • Midlothian development officer input for staff • Develop an approach for East Lothian		2015 2015 onwards
	Schools	• Ensure Numeracy and Mathematics forms part of school/cluster planning • Ensure staff engage with Numeracy and Mathematics academies to deepen understanding of how children learn skills and concepts in Numeracy and Mathematics and to improve pedagogy. • Provide opportunities to share practice. • Monitor and evaluate practice to secure improvement.	• Clear and consistent methodologies are in place to ensure continuity and progression for learners	2014 – 2018 2014 onwards 2014 onwards 2014 onwards
	Staff	• SEAL graduates develop practice based on the SEAL approach in class and begin to support colleagues in school. • Staff engage in school based developments for Numeracy and Mathematics to improve outcomes for learners. • Staff are aware of nursery Numeracy and Mathematics academies and leaders are identified to take these developments forward in primary schools. • Staff engage in Nursery and mathematics academies and develop practice in class.	• Developing practice and confidence in teaching and assessing Numeracy and Mathematics • Gaps in learning begin to be addressed • Raised expectations • Improved learning experiences for learners • Improved attainment in numeracy and mathematics	2014 onwards 2014 onwards 2015 onwards 2015 onwards

Understand progress in Numeracy and Mathematics				
Ensure shared understanding of standards, particularly at key transition points, in order to raise achievement in mathematics and numeracy - *key transition points - Nursery to P1, P7-S1, BGE to Senior Phase	Authority	• Develop and evaluate East Lothian 'HELP' resource to support a shared understanding of standards across transitions - Numeracy and Mathematics. • Work with colleagues to develop annotated examples of achievement in Numeracy and Mathematics to support moderation activity. • Commission Education Scotland development time to inform and develop assessment and moderation practice. • Support School Improvement Partnership Programme (SIPP) to develop tracking and monitoring of attainment BGE S1 to S3 • Deliver INCAS and SOSCA standardised assessments to support assessment and tracking of numeracy at all levels. • Deliver Numeracy and Mathematics academies to improve understanding of progress in learning.	• Shared understanding of standards and expectations • Dissemination of information and practice at national level. • Greater collaboration across schools to secure improvement. • More robust standardised testing. • Greater confidence in identifying next steps in learning and approaches to support learners' progress.	2014/15 2015 onwards March 2015 Conference 2014 onwards 2014 onwards 2014 onwards

	Schools	• Ensure there is a regular focus on numeracy and/or mathematics as part of the school and cluster moderation activity. • Trial and use East Lothian HELP sheets and National resources to develop a shared understanding of standards and to raise expectations, particularly at key transition points. • Ensure high quality assessment evidence with clear evidence of breadth, challenge and application. • Develop opportunities for learners to lead the dialogue about their learning and progress, including at key points of transition.	• Shared understanding of standards • Shared understanding of quality assessment and moderation evidence to make sound judgements about attainment and progress. • Greater involvement of learners in assessment and moderation activity, particularly at key points of transition.	2014 onwards 2014 onwards 2014 onwards 2014 onwards
	Staff	• Work with colleagues to share understanding of standards and expectations through moderation activities involving coherent planning, checking, sampling reviewing and providing feedback for improvement. • Ensure assessment always supports learning and is based on a wide range of evidence exemplifying breadth, challenge and application. • Involve learners fully in assessment and moderation.	• Increasingly robust assessment and moderation practices. • Increased confidence and continuity of assessment evidence. • Learners fully involved in assessment and moderation activities - leading the dialogue about learning at key points of transition.	2014 onwards 2014`onwards 2014 onwards

Effective leadership in Numeracy and Mathematics				
Develop leadership at all levels so everyone is accountable for raising attainment in Numeracy and Mathematics	Authority	• Develop a sustainable approach to leadership of Numeracy and Mathematics through Numeracy and Mathematics Academies and learning networks. • Pilot and develop a cluster model led by practitioners. • Develop a mentoring programme through drop in sessions to continue to support practitioners. • Develop a leadership role for learners to become Numeracy and Mathematics champions to support the strategy • Develop a programme on Mindsets to develop leadership responsibility in all. • Develop Numeracy Leadership events to support senior managers	• Sustainable leadership opportunities and developments to support learning in Numeracy and Mathematics. • Increased ownership and accountability. • Positive mindset to Numeracy and Mathematics.	2014 onwards 2014`onwards 2015 onwards 2015 onwards 2015 onwards
	Schools	• Establish lead learners for Numeracy and Mathematics amongst staff and learners. • Through monitoring, support and challenge, ensure all staff understand their responsibilities to raise attainment. • Engage with authority and national leadership opportunities. • Encourage staff to access Numeracy and Mathematics academy networks.	• Increased accountability for raising attainment at every level. • Positive mindset towards Numeracy and Mathematics.	2014 onwards 2014 onwards 2015 onwards 2014 onwards

	Staff	• Understand their role in raising attainment in Numeracy and Mathematics. • Foster positive mindsets in learners to ensure they take responsibility for their learning and progress. • Access opportunities at authority and national level to engage in Numeracy and Mathematics networks and developments to improve practice.	• Increased accountability for raising attainment at every level. • Greater confidence in leading and developing pedagogy. • Positive mindset towards Numeracy and Mathematics.	2014 onwards 2014 onwards 2014 onwards
Engaging family and community in Numeracy and Mathematics				
Improve engagement of parents/carers and the wider school community to improve attainment in Numeracy and Mathematics	Authority	• Develop the Curriculum for Excellence website to improve information about Numeracy and Mathematics in East Lothian. • Create documentation for parents/carers on how they can support Numeracy and Mathematics at home, including through the 'What you say counts' campaign. • Share practice from schools and communities on engaging parents/carers and the wider community in Numeracy and Mathematics e.g. Together we Count, Employability Skills Weeks, Pre-school work with parents. carers. • Develop an area of the website linking life skill resources and tools.	• Improved access to information and resources. • Increased opportunities to be involved. • Improved mindsets towards Numeracy and Mathematics – seen as increasingly relevant and a skill for life.	2015 onwards 2015 onwards 2015 onwards 2015 onwards

	Schools	• Make parents/carers aware of resources and information available to them through the school, the authority and at national level. • Engage in the 'What you say counts' campaign • Continue to develop opportunities to engage parents and carers supporting learners. • Work with partners to support Numeracy and Mathematics e.g. stay and play, adult numeracy, employers. • Encourage parents to engage in programmes on Mindsets.	• Joined up approach to raising attainment in Numeracy and Mathematics. • Improved access to information and resources. • Increased opportunities to be involved. • Improved mindsets towards Numeracy and Mathematics – seen as increasingly relevant and a skill for life.	2014 onwards 2015 onwards 2014 onwards 2014 onwards 2014 onwards
	Staff	• Ensure parents/carers are well-informed about Numeracy and Mathematics and how they can help learners, including through the 'What you say counts' campaign. • Use opportunities to involve parents/carers in Numeracy and Mathematics events, life skills work, and employability skills events. • Through knowledge of learners and their families, target and support to improve numeracy levels. • Engage parents and carers in Mindset developments.	• Shared approach to raising attainment in Numeracy and Mathematics. • Increased opportunities to be involved. • Improved mindsets towards Numeracy and Mathematics – seen as increasingly relevant and a skill for life.	2014 onwards 2014 onwards 2014 onwards 2014 onwards