Education, Children and Families Committee

10am, Tuesday, 6 October 2015

Numeracy Strategy Report

Item number 7.5

Report number Executive/routine

Wards

Executive summary

This report outlines progress with priorities in numeracy and mathematics in 2014/15. The overall aim is to raise attainment in numeracy and mathematics.

Links

Coalition pledgesP5Council outcomesCO2Single Outcome AgreementSO3

Numeracy Strategy Report

Recommendations

The Committee is asked to:

- 1.1 Note the good progress made in improving teachers' numeracy understanding and raising attainment in early primary through the implementation of the Stages of Early Arithmetical Learning (SEAL) methodology.
- 1.2 Note Edinburgh's participation in the inter authority Numeracy Hub and the Hub's value as a vehicle for developing and sharing numeracy practice.
- 1.3 Note the overwhelming success of 'Upper Primary Mathematics' CPD and the need to extend this programme to meet the needs of a wider range of primary teachers to further develop their understanding of numeracy and mathematics.
- 1.4 Note the need for ongoing support for implementation of SEAL throughout primary.
- 1.5 Note the need for the further development of numeracy through an Edinburgh Integrated Numeracy Strategy on the model of the Edinburgh Integrated Literacy Strategy (EILS).

Background

- 2.1 Analysis of attainment in numeracy and feedback from teachers led to the identification of a number of aspects for development as part of the City of Edinburgh Council numeracy Strategy lead by Quality Improvement Officers for both Primary and Secondary Numeracy and Mathematics. These included:
 - Continuing Professional Development;
 - Need for frameworks:
 - Stages of Early Arithmetical Learning;
 - National Qualification support;
 - Assessment and Moderation;
 - Tracking and Monitoring.
- 2.2 Locally, primary teachers' subject knowledge and confidence in delivering numeracy and mathematics has been less strong. Continuing Professional Development programmes have proven successful and the strategy aims to widen the reach of existing successful courses.

- 2.3 In 2013/14 CEC began implementation of SEAL to support the improvement of teacher knowledge and confidence in teaching number, and to raise attainment in number in early primary.
- 2.4 A development officer was appointed to lead SEAL, along with the wider remit of support for numeracy and mathematics. The development officer has been in post since January 2013.
- 2.5 Six colleagues were trained at the East Lothian numeracy academy between January 2013 and May 2013. This allows them to deliver training on SEAL to teachers in Edinburgh.
- 2.6 There is a 4-year implementation plan for SEAL, with evaluation of impact measured through questionnaires and attainment data. (See appendix 1).
- 2.7 The Primary and Secondary Numeracy and Mathematics Quality Improvement Officers and the development officer have provided schools with extensive support to develop their Broad General Education Numeracy and Mathematics Curriculum. This has included a range of support from curriculum design and assessment methodology to learning and teaching and moderation practices.
- 2.8 Secondary school Mathematics departments are still managing the transition between old and new SQA qualifications. Almost all have now fully implemented their S4 courses and programmes, some (6 out of 23) have moved towards the new Higher qualifications this session. All will be presenting the complete suite of new qualifications from May 2016.

Main report

Attainment in Numeracy and Mathematics

3.1 Standardised assessments allow individual schools and the authority to track attainment. For individual schools, and across the authority, we can also use the data to identify areas for improvement in numeracy and mathematics.

P1

- 3.2 To evaluate the impact of SEAL in Edinburgh a new standardised assessment was introduced in 2013/14 for P1 learners.
- 3.3 Since that date the following strengths have been identified:
 - 3.3.1 An increase in the average standardised score of our P1 learners (i.e. the numeracy and mathematics scores of our P1 learners are improving);
 - 3.3.2 A decrease in the percentage of learners with "very low" scores in this assessment;
 - 3.3.3 Above national performance in the number element of the assessment.

- 3.4 The following areas for improvement were also identified:
 - 3.4.1 Continue to improve the overall average standardised score to overtake the national average;
 - 3.4.2 Support schools to analyse data to ensure equity across all groups of learners. This will allow schools to identify and work on their own areas for improvement specific to their data and context.

P4

- 3.5 We have used the same standardised assessment in P4 over the last 5 years, allowing us to track data over a longer time period.
- 3.6 In P4 the assessment data identified the following strengths:
 - 3.6.1 An improvement in the average standardised score (i.e. the numeracy and mathematics scores of our P4 learners are improving);
 - 3.6.2 A reduction in the percentages of learners with "very low" scores in this assessment.
- 3.7 The following areas for improvement were also identified:
 - 3.7.1 Continue to improve the average standardised to overtake the national average (we aim for our P4 learners to outperform learners of the same age in the UK);
 - 3.7.2 Support schools to analyse data to ensure equity across all groups of learners.

P7

- 3.8 We have used the same standardised assessment in P7 over the last 5 years, allowing us to track data over a longer period of time.
- 3.9 In P7 the assessment identified the following strengths:
 - 3.9.1 A 5-year trend of improvement in the average standardised score (i.e. the numeracy and mathematics scores of our P7 learners have been improving year on year for the last five years).
- 3.10 The following areas for improvement were also identified:
 - 3.10.1 Continue to improve the average standardised score to overtake the national average (we aim for our P4 learners to outperform learners of the same age in the UK);
 - 3.10.2 Support schools to analyse data to ensure equity across all groups of learners.

- 3.11 We have used the same standardised assessment in S2 over the last 5 years, allowing us to track data over a longer time period.
- 3.12 In S2 the assessment identified the following strengths:
 - 3.12.1 An increase in the percentage of learners with "very high" scores in this assessment.
- 3.13 The following areas for improvement were also identified:
 - 3.13.1 Improve the average standardised score to overtake the national average (we aim for our P4 learners to outperform learners of the same age in the UK);
 - 3.13.2 Support schools to analyse data to ensure equity across all groups of learners.

Stages of Early Arithmetical Learning (SEAL)

- 3.14 The programme focuses on two strands for improving confidence of teachers and hence attainment in numeracy in Edinburgh schools:
 - 3.14.1 Whole school training (for teachers, managers and pupil support assistants) to improve confidence, knowledge and attainment in number and number processes across a whole school;
 - 3.14.2 A strategic 4-year planned programme of stage specific training. By the end of the 4 years all P1-P4 teachers will have been trained and equipped to confidently use SEAL to teach number and number processes within their learning environment.

Whole School SEAL Training

- 3.15 By the end of 2014/15 a further fourteen primary schools will have been trained in SEAL, resulting in 79 out of 88 primary schools having completed whole school training.
- 3.16 By the end of 2014/15 there will be 125 SEAL champions, each of whom will have been provided with 8 sessions of intensive training. SEAL champions are trained to support colleagues in their school with planning, learning and teaching, assessment and are able to lead staff discussions on teaching number using SEAL.
- 3.17 Resources have been created to support teachers in planning, and learning and teaching. These are shared online through Microsoft 365, allowing teachers direct access to support materials.

P1 SEAL Training

- 3.18 In 2013/14 97% P1 teachers were trained in SEAL.
- 3.19 In 2014/15 and 2015/16 a similar SEAL training course was provided for teachers new to P1.

- 3.20 In addition to the initial training, teachers are offered a programme of follow-up sessions where they get targeted additional support from the development officer and opportunities to engage in professional dialogue with fellow P1 teachers.
- 3.21 The impact of P1 training has been evaluated using teacher questionnaires and attainment data.
- 3.22 P1 teacher questionnaires show a significant improvement in teacher knowledge and confidence in understanding, planning, teaching and assessing a child's progress in number from August 2013 to May 2015. The highlights include:
 - 3.22.1 Teachers' knowledge and understanding of progression of learning about number increasing from 32% confidence to 83%;
 - 3.22.2 Teachers' confidence in teaching number increasing from 68% confident to 96%.

P2 SEAL Training

- 3.23 P2 SEAL training ran for the first time in 2014/15. 144 P2 teachers were trained in this year.
- 3.24 P2 training is running again in session 2015/16 for all teachers new to P2.
- 3.25 In addition to the initial training, teachers are offered a programme of follow-up sessions where they get targeted additional support from the development officer and opportunities to engage in professional dialogue with fellow P2 teachers.
- 3.26 The impact of P2 training has been evaluated using teacher questionnaires (to measure improvement in knowledge and confidence).
- 3.27 P2 teacher questionnaires show a significant improvement in teacher knowledge and confidence in understanding, planning, teaching and assessing a child's progress in number from August 2014 to May 2015. The highlights include:
 - 3.27.1 Teachers' knowledge and understanding of progression of learning about number increasing from 32% confidence to 76%;
 - 3.27.2 Teachers' confidence in teacher number increasing from 57% confident to 96%.

P3 SEAL Training

- 3.28 In 2015/16 P3 SEAL training will take place for the first time. This strategy ensures that those learners who have been taught in this way in P1 and P2 will continue to have this methodology as they move through the school.
- 3.29 As with P1 and P2 we will continue to measure the impact through teacher questionnaires and attainment data.

Early Years Numeracy

3.30 As part of the development of Numeracy and Mathematics a working group of key numeracy staff within the authority meets regularly to discuss progress of

the strategy in the context of the Early Years. The following work streams were identified from the work of this group:

- 3.30.1 SEAL training for nurseries as part of the wider CPD programme;
- 3.30.2 Tynecastle Nursery is using number rhymes in the nursery to improve numeracy skills through the Early Years Collaborative. Part of this project also includes working with parents to encourage and support the use of number rhymes at home. Impact will be measured through the Early Years Collaborative;
- 3.30.3 Moffat Early Years Campus staff, in collaboration with Educational Psychologists and the Family Learning Worker have developed a series of parent workshops titled "It's All About Maths". At these workshops parents have created parent postcards to help generate, and follow-through with, ideas for supporting and using numeracy in the home environment. The workshops also help improve parents' confidence with their own numeracy as well as supporting and encouraging the numeracy learning of their children;
- 3.30.4 CEC has developed resources to support early years staff with planning, learning and teaching, and tracking progress. These resources include a numeracy and mathematics early years planning and assessment tracker, a numeracy and mathematics early years audit toolkit for a numeracy environment indoors and outdoors, focused learning sheets to support planning. A CD containing examples of national and local good practice in numeracy and mathematics in the early years has been shared with all establishments.

Career Long Professional Learning (CLPL)

3.31 The need for career long professional learning (CLPL) with a focus on teaching numeracy and mathematics in upper primary was identified due to low teacher confidence. In both 2013/14 and 2014/15 an intensive 6 session course ran to support teachers in this area. The content of the sessions was designed to suit the needs of the cohort attending, with particular focus on improving teachers' mathematical understanding and practical examples for learning and teaching. Evaluation was exceptionally positive and this professional learning opportunity will continue to be available in session 2015/16.

S1-3 Broad General Education

- 3.32 The secondary Quality Improvement Officer with the lead for maths has supported schools with the development of their curricula to incorporate assessment opportunities within the day to day learning and teaching of their courses and programmes.
- 3.33 S2 standardised testing provides evidence to contribute to each young person's 'suite' of evidence to support their achievement.

3.34 Key secondary Mathematics Curriculum Leaders have been involved in the Assessment and Moderation teams. This has supported the community to move this thinking forward.

S4-6 Senior Phase Education

- 3.35 Please note that the 2014 data which follows was released in March 2015 and is the most up to date available for these measures.
- 3.36 Data for leavers in 2015 is not available until March 2016. Currently available, non-validated local information suggest that 2015 data will continue to show an improving trend across all levels.
- 3.37 In 2014 90% of young people leaving secondary schools had achieved SCQF level 3 Numeracy. This is a 5 year positive trend. Our ongoing aim is to raise this to 95%.
- 3.38 In 2014 80% of young people leaving secondary schools had achieved SCQF level 4 Numeracy. This is a 5 year positive trend. Our ongoing aim is to raise this to 85%.
- 3.39 In 2014 58% of young people leaving secondary schools had achieved SCQF level 5 Numeracy. This is a 5 year positive trend. Our ongoing aim is to raise this to 64%.
- 3.40 In 2014 1442 young people in S4 sat a National 5 mathematics qualification.1396 young people in S4 passed a National 4 Mathematics qualification.359 achieved a National 3 qualification.
- 3.41 In 2014 1161 young people in S5/6 sat a higher mathematics qualification.
- 3.42 There has been ongoing central development of curriculum materials for all new SQA Mathematics courses.
- 3.43 Several CEC staff hold positions within the SQA which has allowed the community to successfully manage the transition towards implementation of the new qualifications.
- 3.44 Several CEC mathematics departments have adopted the 'Lifeskills Mathematics' course to support their school's drive to develop skills for learning, life and work.

Supporting Learners with Additional Support Needs in Numeracy

- 3.45 The Supporting Learners with Additional Support Needs in Numeracy document gives schools advice on how to identify and address difficulties which young people may have with numeracy.
- 3.46 This document gives our current position on dyscalculia.
- 3.47 Training for staff on this document and how to use it in schools has been provided through the Continuing Professional Development (CPD) directory.

Assessment and Moderation of Numeracy and Mathematics

- 3.48 To improve teachers' confidence in deciding when a young person has achieved a Curriculum for Excellence level in numeracy and mathematics we are supporting schools with moderation. This replicates the assessment and moderation support given for literacy and English in 2013/14 and 2014/15.
- 3.49 In 2014/15 clusters identified a rep who attended sessions on assessment and moderation. With support from CEC officers they agreed and shared the standard of what achieving a level might look like within the broad general education (BGE), and consequently produced exemplars to support colleagues.
- 3.50 In 2015/16 each cluster will focus on moderation of numeracy and mathematics using the exemplars produced.

Inter-Authority Numeracy Hub 2014/15

- 3.51 The Scottish Government funded an inter-authority numeracy hub involving the City of Edinburgh, East Lothian, Midlothian and West Lothian. The focus of this hub is on raising attainment in numeracy and mathematics through:
 - Stages of Early Arithmetical Learning;
 - Developing mathematical literacy;
 - Production of a package of training materials under the banner of a maths academy for teachers.
- 3.52 To develop SEAL, CEC and East Lothian jointly ran two numeracy academies. Each academy provided teachers with 5 days intensive training on SEAL to further develop their own expertise as teachers, as supporters to colleagues in school and as trainers within their local authority. Forty teachers in total attended these academies, with representation from City of Edinburgh, East Lothian, City of Glasgow, North Lanarkshire, and Stirling and Clackmannanshire. Colleagues from Education Scotland also attended as observers.
- 3.53 As a culmination of the year's work, the four local authorities jointly staged a conference titled "Numeracy Leadership Striving for Excellence in Every School" in April 2015 for school senior leaders.
- 3.54 Midlothian has shared its approach to developing mathematical literacy. This has been launched through a continuing professional development (CPD) session with teachers in Edinburgh. A group of Edinburgh teachers will now develop this further in a small number of schools and measure impact.
- 3.55 There is ongoing work between the four local authorities to develop a maths academy which aims to boost teacher confidence and understanding of progression in fractions, decimal fractions and percentages. This will take the form of a package of training materials for schools and clusters in the local authorities to use, with links to teachers' CLPL (reading links). A model using this approach will be developed by The Royal High cluster this session.

Education Scotland Numeracy Hub Champions

- 3.56 All local authorities have been given funding under the new Numeracy Hub Champions initiative, aimed at raising attainment in numeracy across Scotland.
- 3.57 Each local authority has been asked to nominate a numeracy hub champion: in Edinburgh our champion is the development officer for numeracy and mathematics.
- 3.58 Hub champions receive regular ongoing training from Education Scotland and are expected to highlight national priorities for raising attainment in numeracy for their own local authority.
- 3.59 City of Edinburgh council will have the following priorities for the numeracy hub champion:
 - P3 SEAL Training;
 - Progression, assessment and moderation support for 5 targeted clusters (these clusters were identified due to the extent to which their cohort by cohort numeracy standardised scores lagged their literacy standardised scores).
- 3.60 Action plans and reports (supported by thorough evaluations of impact) will be submitted to Education Scotland throughout the year.

Numeracy Strategy

- 3.61 CEC is developing an integrated numeracy strategy document. This will allow colleagues in schools to be clear about our position and the support offered for teaching numeracy and mathematics in schools and establishments. It will also set out our priorities for improvement in numeracy and mathematics.
- 3.62 A draft version of the Integrated Numeracy Strategy document will be completed by October 2015.
- 3.63 Numeracy is a CEC 'key strategic priority' for schools in 2014/15.

Parental Support

3.64 The Development Officer has supported a number of primary schools to deliver parental information evenings for numeracy and mathematics including SEAL. Following this a package has been provided for all schools giving a scaffold of presentations to help them run their own numeracy and mathematics parental information sessions.

Community Learning and Development (CLD)

3.65 The "It's All about Maths" programme, developed and delivered by CLD Family Learning, has run in 5 early years settings. The aim of this programme is to engage parents and carers to support the early numeracy learning of their children in the home.

- 3.66 Five further early years establishments will run the programme for parents and carers in 2015/16.
- 3.67 CLD Family Learning will provide training for colleagues in this programme through Continuing Professional Development (CPD) sessions in 2015/16.
- 3.68 CLD Family Learning will further engage families in support of their children's early numeracy learning through additional group sessions with parents/carers, children and P1 staff in class based, family learning activities focusing on SEAL methodology.

Measures of success

4.1 Overall success is measured using a suite of indicators within the Children and Families Service Plan to ensure that our children and young people are successful learners, confident individuals and responsible citizens, making a positive contribution to their communities.

Financial impact

5.1 This work is funded from existing budgets.

Risk, policy, compliance and governance impact

6.1 There are no adverse impacts arising.

Equalities impact

7.1 The recommendations in this report should lead to enhanced equalities for children and young people attending City of Edinburgh schools.

Sustainability impact

8.1 There are no impacts on carbon, adaptation to climate change or sustainable developments arising directly from this report.

Consultation and engagement

9.1 The developments in numeracy and mathematics have taken place through partnership working involving learners, practitioners from across services and sectors within educational establishments and Children and Families.

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Links

Coalition pledges	P5 – Seek to ensure the smooth introduction of the Curriculum for Excellence and that management structures within our schools support the new curriculum
Council outcomes	CO2 – Our children and young people are successful learners, confident individuals and responsible citizens making a positive contribution to their communities
Single Outcome Agreement SO3 Appendices	SO3 – Edinburgh's children and young people enjoy their childhood and fulfil their potential 1 SEAL 4-Year Strategic Plan

Appendix 1 - SEAL 4-Year Strategic Plan

	2013/14	2014/15	2015/16	2016/17	Evaluation
P1 CPD	•250 teachers trained •5 follow-up sessions offered to ensure further support in place	 Capacity to train 240 teachers 4 follow-up sessions offered to ensure further support in place 	 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	•Teacher Questionnaire Collecting information on how embedded SEAL is in each school's P1 •Attainment Data (when available)
P2 CPD		Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place	 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	 Teacher Questionnaire Focus Groups Collecting information on how embedded SEAL is in each school's P2
P3 CPD			 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	 Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place 	 Teacher Questionnaire Focus Groups Collecting information on how embedded SEAL is in each school's P3

	2013/14	2014/15	2015/16	2016/17	Evaluation
P4 CPD				Capacity to train 160 teachers 4 follow-up sessions offered to ensure further support in place	 Teacher Questionnaire Focus Groups Collecting information on how embedded SEAL is in each school's P4 Attainment Data (when available)
SfL CPD	•60 teachers trained •Follow-up sessions offered to ensure further support in place	•Capacity to train 80 teachers •Follow-up sessions offered to ensure further support in place	•Capacity to train 80 teachers •Follow-up sessions offered to ensure further support in place	 Capacity to train 80 teachers Follow-up sessions offered to ensure further support in place 	 Teacher Questionnaire Focus Groups Collecting information on numeracy SfL in schools Attainment Data (when available)
Whole School Training	•34 schools trained •7 training days across 5 in-service days •1050 staff (teachers and PSAs) trained in total	•25 schools trained •5 training days across 5 in-service days	•Capacity to train 150 at each in-service day •Capacity for 750 in total (approximately 23 schools)	 Capacity to train 150 at each in-service day Capacity for 750 in total (approximately 23 schools) 	TeacherQuestionnaireHT meetingsAttainment Data(when available)

	2013/14	2014/15	2015/16	2016/17	Evaluation
SEAL Champions CPD	•40 SEAL champions trained •8-session course •One SEAL champion for each school getting whole school training •2 follow-up session to ensure impact continues	•45 SEAL champions •8-session course •One SEAL champion for each school getting whole school training (and extra spaces for schools who have lost their champion) •2 follow-up session to ensure impact continues	•40 SEAL champions •8-session course •One SEAL champion for each school getting whole school training (and extra spaces for schools who have lost their champion) •2 follow-up session to ensure impact continues	•40 SEAL champions •8-session course •One SEAL champion for each school getting whole school training (and extra spaces for schools who have lost their champion) •2 follow-up session to ensure impact continues	Evaluation forms and learning logs L&T Networks
Training New SEAL Trainers	•DO supporting new SEAL trainers (5 primary teachers)	•12 new trainers trained at East of Scotland Numeracy Academy •5 additional trainers trained by Midlothian •Now 23 trainers in total	•Mentoring programme for new trainers	 Mentoring programme for new trainers Possibility for new trainers to be trained in Edinburgh Aim for one trainer (or more) per cluster 	 Evaluations forms an learning logs DO meetings with trainers