Education Scotland
Foghlam Alba

Numeracy Across Learning

This professional learning resource helps practitioners work together to explore the benefits and opportunities associated with embedding numeracy skills across the curriculum.

Numeracy across Learning: Professional Learning Resource

Introduction

This resource provides a series of activities designed to support groups of practitioners who are taking a fresh look at numeracy across learning, reflecting on current practice to consider how opportunities can be maximised for developing skills in numeracy through learning activities across the curriculum.

It encourages practitioners to identify numeracy that is at an appropriate level for learners, promoting challenge and developing cross-curricular links. It provides practitioners with the opportunity to make connections in their planning through exploring clear and relevant links across the curriculum. For specific curricular areas, staff can ensure that both the numeracy and the other curricular outcomes provide appropriate breadth, depth and challenge for all learners and that opportunities are maximised for progression in, and application of skills in numeracy.

The importance of numeracy across learning is highlighted in several key documents:

"Numeracy and mathematical thinking encompasses many different elements … however, numeracy is not only about developing these skills. It is also about having the ability to apply these concepts in all areas of life. Therefore numeracy should be embedded throughout the curriculum and the environment and should not simply be seen as an area on its own."

Realising the Ambition: Being Me

"In the strongest examples, staff and young people have a shared understanding of the importance of numeracy, how it is delivered across the school, and what skills are being developed."

"There is a need for [secondary] schools to develop a deeper, shared understanding of how all staff are contributing to the development of young people's numeracy skills. This should include developing a coherent approach where all stakeholders, and in particular young people, understand and can articulate the skills they are developing and how these can be used across their learning, life and work. It is of vital importance that schools continue to develop young people's numeracy skills in the senior phase."

Numeracy and mathematics for Scotland's learners: a thematic report

"Shared planning for the contexts in which children and young people learn and apply numeracy skills is … crucial. Children and young people need opportunities to bring together different combinations of numeracy skills from the various lines of progression. High quality learning depends upon achieving a suitable balance between developing key facts and integrating and applying them in relevant and imaginative contexts."

Numeracy across learning, principles and practice

Raising the profile of numeracy in establishments and communities

In early learning and childcare (ELC) settings, primary and secondary schools, it is important to take a consistent approach to the development and application of numeracy skills across learning. Increasing the profile of numeracy can raise the awareness of practitioners, learners and families of when, where and how numeracy skills are acquired and used.

National events such as Maths Week Scotland and National Numeracy Day can provide a focus for raising awareness and engaging the whole learning community in recognising the importance of numeracy as a crucial skill for life, learning and work. Events such as this can complement the numeracy learning that should be embedded across the curriculum.

When engaging with local employers and other external partners, such as STEM Ambassadors, it is important to highlight the ways in which numeracy skills are used in the workplace.

Within the refreshed narrative on Scotland's curriculum there is a continual focus on learners experiencing a coherent curriculum, so that, *'they have opportunities to develop the knowledge, skills and attributes they need to adapt, think critically and flourish in today's world'.* This provides opportunities to look beyond the curricular areas and engage across the four contexts for learning, in particular through interdisciplinary learning.

Numeracy Professional Learning Resources

Education Scotland has published a series of Numeracy Professional Learning Resources which aim to enhance knowledge and understanding of effective learning and teaching, and progression in numeracy. Their purpose is to help practitioners to identify methods for enhancing learners' progression and skills in numeracy and their application in solving problems.

Practitioners can use these resources to review and reflect on the progress of their learners, strategies for the reinforcement of learning and the strengths and improvement areas within their own professional learning. School leaders can use these resources to support curriculum development and improvement. Local authority leaders can use these resources to support the centrally provided professional learning they offer to practitioners.

Using this Professional Learning Resource

The professional learning activities that are outlined below take the form of professional discussion and collaboration based on a series of reflective questions. They can form part of the planning of new learning opportunities or enhancing existing ones. Practitioners are encouraged to consider how these learning opportunities enable learners to re-visit and build fluency in their existing numeracy skills and apply these skills in familiar and unfamiliar contexts. Practitioners are also encouraged to think about how these contexts can provide a stimulus for developing new knowledge and skills.

Activity One: Developing numeracy in the early years

Purpose

To explore opportunities for developing the numeracy skills of young children through a range of interactions, experiences and spaces.

Activity

Spend time with colleagues to consider and discuss one or more of the following reflective questions, taking into account your indoor and outdoor learning environment. These could be used as part of professional discussions supporting continuous improvement.

You will need access to the Numeracy and Mathematics Benchmarks and to Realising the Ambition : Being Me.

Reflective questions

- In your setting, what types of interactions, experiences and spaces are particularly helpful in developing, extending and applying skills in numeracy?
- In what ways are curiosity, creativity and inquiry promoted in numeracy? What types of interactions, experiences and spaces have been most successful in facilitating this?
- In what ways do every day routines and interactions help children build fluency and confidence in numeracy skills?
- How is children's progression in numeracy ensured within your setting? Are the children, other staff and parents involved in this? How are milestones recognised and recorded?
- How do meaningful observations inform next steps in learning?
- What balance of child initiated and adult initiated play ensures that the entitlement to Early Level Numeracy is met?

Activity Two: Reviewing or planning numeracy rich activities (primary setting)

Purpose

To maximise the opportunities for the development of numeracy & mathematics skills in planned or existing numeracy rich activities.

Activity

Spend time with colleagues to consider and discuss one or more of the following reflective questions.

You will need access to the Numeracy and Mathematics Benchmarks.

Consider a planned or existing numeracy rich experience linked to an area of the curriculum other than Numeracy & Mathematics

or

Consider a planned or existing numeracy rich inter-disciplinary learning project.

Reflective questions

- What prior learning is needed so learners can access this experience or project? What actions can be taken to ensure this prior learning is in place?
- Which existing numeracy skills are being applied in an unfamiliar context?
- Which new numeracy skills are being introduced or developed through this activity? What opportunities do learners have to demonstrate their understanding?
- In what ways does this activity promote curiosity, creativity and inquiry in numeracy? In what ways are learners' interests and passions being reflected?
- Through discussion and making adaptations, what additional opportunities for numeracy development could be included?

Activity Three: Reviewing or planning numeracy rich activities (secondary setting)

Purpose

To plan or review, collaboratively, a numeracy rich project or unit of work in order to maximise its potential for the development and application of numeracy skills in the context of one or more other areas of the curriculum.

Activity

Spend time with colleagues to consider and discuss one or more of the following reflective questions.

You will need access to the Numeracy and Mathematics Benchmarks.

Consider a planned or existing numeracy rich unit of work from an area of the curriculum other than Numeracy & Mathematics

or

Consider a planned or existing numeracy rich inter-disciplinary learning project

or

Consider an area of numeracy and mathematics that can be enriched by incorporating contexts from other areas of the curriculum.

Reflective questions

- What prior learning is needed so learners can access this experience or project? What actions can be taken to ensure this prior learning is in place?
- In what ways are learners given opportunities to combine and apply previously learned numeracy skills in new or unfamiliar contexts?
- What new skills, knowledge and understanding in numeracy can learners develop? In what ways does this activity promote curiosity, creativity and inquiry?
- How are learners encouraged to make links within the numeracy & mathematics curriculum and to the wider curriculum? In what ways can learners recognise the relevance and importance of numeracy & mathematics?
- How will learners' numeracy skills be assessed and recorded?

Activity Four: Reviewing or planning numeracy rich activities (cluster setting)

Purpose

To plan or review, collaboratively, a numeracy rich project or unit of work in order to maximise its potential for the development and application of numeracy skills in context and to provide rich transition information.

Activity

This activity is designed to be completed in collaboration with colleagues across a cluster. For example, a group of Primary 3 teachers, a group of Primary 7 and S1 teachers planning for transition, a group of teachers with multi-composite classes in the upper primary.

You will need access to the Numeracy and Mathematics Benchmarks.

Consider a planned or existing numeracy rich unit of work from an area of the curriculum other than Numeracy & Mathematics

or

Consider a planned or existing numeracy rich inter-disciplinary learning project

Reflective questions

- What is our shared understanding of the level of numeracy skills required of learners?
- What prior learning is needed so learners can access this experience or project? What actions can be taken to ensure this prior learning is in place?
- In what ways are learners provided with opportunities to combine and apply previously learned numeracy skills in new or unfamiliar contexts?
- What new skills, knowledge and understanding in numeracy can learners develop? In what ways does this activity promote curiosity, creativity and inquiry?
- How will learners demonstrate their application of numeracy skills in order to provide meaningful information to support smooth transition?
- How can next steps in learning be identified? How can learners be involved in this?

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