Milestones to support learners with complex additional support needs

Numeracy and Mathematics

March 2018

Education Scotland
Guidance on using milestones

Context
In 2017, Education Scotland published Benchmarks within all curriculum areas for Early through to Fourth level of Curriculum for Excellence. The purpose of these benchmarks was to provide clarity on the national standards expected within each curriculum area at each level setting out clear lines of progression. In addition, the intention was to make clear what learners need to know and be able to do to progress through the levels and to support consistency in teachers' and other practitioners' professional judgements. Benchmarks are to be used to support teachers' professional judgement of achievement of a level.

Curriculum for Excellence aims to provide 'a coherent, flexible and enriched curriculum from 3 to 18 firmly focused on the needs of the child and young person.' Children and young people with complex additional support needs are a wide and varied group of learners who often require adaptations to the curriculum and a more nuanced understanding of how they learn in order to track their progression in a meaningful way. Many learners with complex additional support needs are likely to make expected progress within Early to Fourth level. However, for a number of these learners, tracking of progression will be at a pre-early level.

A number of schools and Education Authorities had already begun the process of developing their own curriculum milestones and progression frameworks to support the assessment of learners with complex additional support needs, many of whom were working at a pre-early level. In order to ensure consistency and to enable the tracking of progression for learners who require support to consolidate their knowledge, skills and competencies at a pre-early level, Education Scotland has produced this set of milestones and accompanying guidance to specifically support the assessment of learners with complex additional support needs.

The milestones and guidance are not intended to provide an alternative curriculum for children and young people with complex additional support needs and planning for learners with complex additional support needs should continue to be based on the Experiences and Outcomes from Curriculum for Excellence with personalisation where required.

What are 'complex additional support needs'?
Complex additional support needs may arise as result of:
- the severity of one or more factors resulting in need, and/or
- the combined impact of a number of separate factors, one or more of which may be severe.

A rigorous, clearly bounded and universally accepted definition is extremely difficult to formulate because of the multiplicity of factors and the impact of specific contexts in different local authorities. For that reason, the National Strategic Commissioning Group (NSCG)[1] is using a working **description** rather than a definition of children and young people with complex additional support needs. Whilst this supplies a broad definition of 'complex additional support needs', these milestones and accompanying guidance refer

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[1] The Strategic Commissioning of National Services was proposed in the 'The Right Help in the Right Place at the Right Time' An independent Strategic Review of Learning Provision for Children and Young People with Complex Additional Support Needs conducted by Peter Doran and published in November 2012.

more specifically to learners with *complex learning needs who are specifically working at a pre-early Level.*

Supporting communication needs

Many learners with complex additional support needs have limited or no verbal language. Therefore, practitioners will employ a range of strategies (dependent on the needs of individual leaners) to support and enable understanding and communication. Use of on-body signing, manual signing, sensory cues, objects of reference, and visual supports such as photographs and symbols can enable learners to understand and anticipate.

Additionally, many leaners will use Voice Output Communication Aid devices (VOCA) for expressive communication. These devices can range from very simple single message devices to high-tech devices such as tablet computers which use specialist apps and software. Learners with complex needs will access these devices in a number of ways through touch screens, assistive switches or eye tracker units. These methods of supporting communication are often referred to as 'Augmentative and Alternative Communication' (AAC).

When assessing learners' progress, staff should make use of and record any type of AAC or other support that facilitates learning.

For further information and support see: http://www.callscotland.org.uk/home/

Key principles

A number of key principles are important to consider when tracking the progression of learners with complex additional support needs.

1. ***A holistic view*** *of the learner must be taken. Learning may not always occur in discrete curriculum areas and it may be necessary to carry out integrated learning in order to determine whether a particular milestone has been achieved in a particular curriculum area.*
2. *Learners' progression should be viewed in the context of **the optimum learning environment** for them. This requires a practitioner to have a clear understanding of the learners' needs to adapt the environment to meet these needs effectively. Supportive interactions will also be likely to form part of the optimum learning environment for a child or young person.*
3. *There should be a focus on what the learner can do, not what they can't. Progress may be made in very small steps. **Success should be celebrated** and shared where possible.*
4. *Learning must be **relevant and purposeful** and built on previous experiences. Taking account of interests and preferences will help engage and motivate the learner.*
5. *Assessment should take account of the **complex interaction between the different aspects of the learners' needs** including medical, sensory, physical, communication and learning needs.*

Theoretical frameworks to support understanding of learners with complex additional support needs

In order to support learners with complex additional support needs, practitioners require both an understanding of the curriculum and typical development. The atypical development of some learners with complex additional support needs means that they will not always progress through their learning in a linear or straightforward way. Practitioners will require an in-depth knowledge of children and young people with whom they work to ensure that they are able to identify development and progression when it occurs. They will also need to recognise the key part that the learning environment and interactions will play in determining the progression of this group of learners. Whilst this is an important facet for all children and young people, it is particularly vital in understanding the progression of these learners.
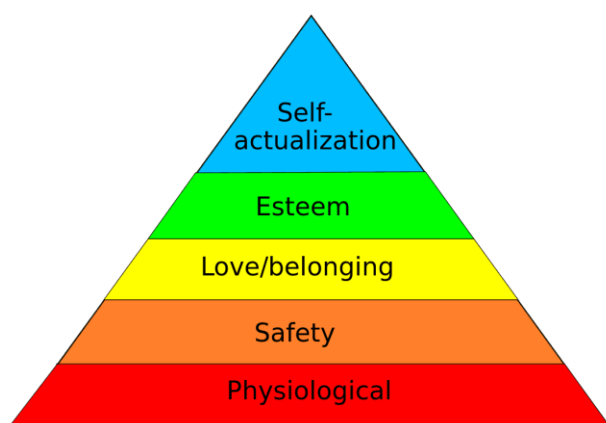
Maslow's hierarchy of needs highlights the basic needs that apply to all learners. For learners with complex health and care needs, careful consideration should be given to planning in order to meet these needs whilst maximising opportunities for learning.[2]

There are several pathways of learning, drawn from a theoretical understanding of development, which can inform understanding when working with learners at very early stages of development. Please note that this is intended only to *signpost practitioners and not as an extensive outline of the theoretical frameworks highlighted*. These include:

Stages	Key messages
Habituation	Learners show a change in a response to a stimulus
Early associative learning leading to classical conditioning	Learners anticipate and make associations between events
Operant conditioning[3]	Learners start to recognise that their action has a consequence
Acquisition	Learners acquire new responses
Fluency	Learners reach a level of mastery
Maintenance	Learners consolidate and maintain a high level of competency
Generalisation	Learners achieve mastery in different settings or contexts
	Learners recognise similarities and apply in new situations
Application or adaptation[4]	
Pre-intentional communication	Learners show involuntary/reflexive responses
Voluntary communication	Learners imitate and react to situations

[2] Diagram adapted from Maslow, A.H (1943) 'A Theory of Human Motivation '*Psychological Review.* **50** *(4): 370–96.*

[3] Pavlov, I. P. (1928). *Lectures on conditioned reflexes*. (Translated by W.H. Gantt) London: Allen and Unwin

[4] Haring, N.G., Lovitt, T.C., Eaton, M.D., & Hansen, C.L. (1978). The fourth R: Research in the classroom. Columbus, OH: Charles E. Merrill Publishing Co.

Unconventional communication	Learners communicate intentionally but in unconventional ways
Conventional communication[5]	Learners use gesture or vocalisation to communicate intentionally
Sensorimotor	Learning is based on motor activity and physical interaction. Object permanence develops at this stage.
Pre-operational	Learners are beginning to use symbols and words to represent objects as their memory and imagination develop
Concrete operational	Learners begin to develop logical thinking and can work things out in their own heads
Formal operational[6]	Learners can think abstractly and test hypotheses

When practitioners are considering the progression of the learners, they should take into account the stages of development outlined above. For example, when noting whether a milestone has been reached, it may be necessary to consider whether a child has simply *acquired* a new skill or knowledge, whether they are *fluent* in using this skill or knowledge and whether they can *generalise* it or *apply it in different and new situations.*

Finally, a recognition of the work of **Vygotsky[7]** and an understanding of the zone of proximal development, i.e. the difference between what a learner can achieve independently and what they can achieve with adult help, is useful. The interaction between an adult and learner is a key factor that will facilitate progression. A skilled communication partner who is sensitive to the learner and can scaffold their learning, can impact on their ability to progress.

Milestones

The terminology of **'milestones'** is used throughout this guidance and progression frameworks for a number of reasons. Milestones are *important points in development* and demonstrate progression. Pre-early level is not defined within Curriculum for Excellence. However, learners who are not able to achieve any of the benchmarks within early level still require tracking and monitoring of their progression. Many of these learners will move on to work at early level but some learners will continue to make progress at this pre-early stage. A number of other progression frameworks developed in other national contexts and within local authorities in Scotland have also used milestones as a means of tracking progression. It is hoped that the use of the milestones will support a more learner-centred approach which celebrates the differences of all learners, recognising that whilst there are individualised milestones that children and young people with complex additional support needs may move through, these are by no means all necessary aspects of progression.

Purpose of milestones
The milestones aim to support practitioners to identify the progression of learning. An important aspect of this work is to take account of the different ways in which learners with complex additional support needs engage with their learning and the levels of support required to do so. Milestones do not capture every aspect of a learners' progression, but can be used to guide practitioners in their assessment and moderation of a learner and to

[5] Rowland, C. (2013). *Communication Matrix for parents and professionals*. Oregon Health and Science University.
[6] Piaget, J. (1936). *Origins of intelligence in the child.* London: Routledge & Kegan Paul
[7] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

track a learners' progress. The tables below will help practitioners to guage the level of engagement for individual learners and determine their level of progress.

Milestones are designed to support practitioners to recognise progression in learning but should not be used as a checklist. Further discussion and moderation activities will support a shared understanding of these milestones and support practitioners' consistent use of the milestones.

Milestones should be used to support learners who are working at a pre-early level in all school settings. However, milestones should not be used to track progression of typically developing children in early learning and childcare settings.

Structure
The structure of the document is similar to the Benchmarks documents. All of the milestones, except the foundation milestones, are organised into curriculum areas and linked to the Organisers and Experiences and Outcomes from Curriculum for Excellence (CfE). Whilst planning activities continues to be based on the Experiences and Outcomes from CfE, the milestones provide an illustration of progression for learners with complex additional support needs at pre-early level.

In addition, some of the earliest milestones focus on early communication, cognitive and sensory skills and form the foundation of all learning. These are outlined in a separate table entitled Foundation of Learning Milestones. The milestones within the foundations of learning and the curriculum areas are set out in terms of their progression. However, it is not expected that every learner will pass through every milestone as they make progress. Some milestones may not be achievable for some learners. It may also be the case children and young people with degenerative conditions that they may not show progression, and lose milestones they have achieved.

In addition to making progression from one milestone to another, learners may also make progress within each individual milestone. The continuum of engagement and the types of support detailed below allow practitioners to understand the breadth and depth of learning which may be undertaken by the learner.

Continuum of Engagement

The following continuum outlines broad forms of engagement which learners may go through in their learning. When undertaking assessment of progress through milestones, practitioners should take account of the following forms of engagement as this will provide additional information as to whether the milestone has been fully achieved. The level of a learner's engagement can vary considerably across different aspects of learning. Practitioners should work together to moderate their understanding of these forms of engagement with a consideration of the specific needs of learners.

Experiences	Encounters	Learner is present during an activity or experience
	Notices	Learner appears to be aware of what is happening around him(er)
	Shows interest	Learner demonstrates some interest in people, events or objects

Actively Engages	Responds	Learner attends and begins to give reactions to show that he/she can tell the difference between people, events or objects
	Focuses attention	Learner demonstrates more consistent attention and shows a clear distinction between specific people, events or objects
	Participates actively	Learner begins to be proactive in his(er) interactions with people, events and objects. He/she anticipates familiar sequence of events
	Initiates	Learner initiates activities and interactions more regularly and respond to options and choices
Applies and extends	Demonstrates understanding	Learner demonstrates his(er) understanding and skills in a specific learning setting
	Consolidates	Learner recalls previous learning and can use it in familiar situations.
	Extends	Learner becomes more confident in his(er) learning and can apply skills in a range of unfamiliar settings.

Types of Support

When supporting learners with complex additional support needs to access the curriculum, it is important for practitioners to take account of the additional physical, communicative, sensory and cognitive barriers to learning which the children and young people may experience.

The following table outlines the broad types of support that may be provided to a learner when assessing progress. When progress is being recorded or shared with others, it can be helpful to include types of support provided. Practitioners should determine what level of support is required in their setting.

Type of support	Examples of support
Physical support	Hand over hand, use of equipment
Gestural support	Simple signs or gesture, pointing, demonstrating
Visual support	Using objects, photos, pictures, symbols
Verbal support	Prompting and cues, expectant pause
Support via technology	Use of switches, apps, communication aids
No support	No support required

Pre-early level Foundation Milestones

The milestones below should be considered alongside the levels of engagement and types of support which are required to help learners demonstrate progression in the milestones.

Area of focus	Milestones

Attention skills	• *Shows a simple reflex response to an individual stimulus.*
	• *Shows a simple reflex response to a range of stimuli, objects, people and activities.*
	• *Shows awareness of something happening:*
	    ○ *Gives a quick and fleeting response*
	    ○ *Gives inconsistent response*
	    ○ *Gives more consistent attention and response.*
	• *Gives shared attention to a range of stimuli, objects, people and activities.*
	• *Anticipates within familiar routines and situations.*
	• *Shares a consistent response in familiar routines and situations.*
	• *Shows understanding of a sequence of activities within a familiar routine.*
	• *Demonstrates extended attention within familiar settings.*
	• *Demonstrates extended attention within unfamiliar settings.*

Communicating preference and choice	• *Shows pleasure/displeasure through:*
	    ○ *Non-verbal or physical response*
	    ○ *Verbal response.*
	• *Accepts or rejects in response to concrete stimuli, objects, people and activities.*
	• *Indicates preferences in response to concrete stimuli, objects, people and activities.*
	• *Consistently shows and expresses preference to stimuli, objects, people and activities.*
	• *Communicates basic needs enablng them to be understood by others, e.g. more/again/finished/enough/stop.*
	• *Makes a choice using:*
	    ○ *Real objects*
	    ○ *Photos*
	    ○ *Symbols.*

Interaction	• *Shows awareness of people and activities.*

	• *Tolerates other people within their space.* • *Demonstrates a clear reaction to people and activities.* • *Responds to facial expressions and/or body language.* • *Shows a response to a social interaction with familiar people and activities.* • *Shows a response to a social interaction with unfamiliar people and activities.* • *Imitates, during interactions, using vocalisations and/or body movements.* • *Initiates an interaction with a familiar person or in a familiar situation.* • *Initiates an interaction with an unfamiliar person or in an unfamiliar situation.* • *Takes turns in an interaction with a familiar person or in a familiar situation.* • *Take turns in an interaction with unfamiliar people and/or unfamiliar settings.*
Cognitive	• *Notices stimuli.* • *Follows/tracks stimuli when they move.* • *Looks around for disappearing stimuli.* • *Explores toys and objects.* • *Shows preference for toys and objects.* • *Recognises that repeated actions lead to a particular effect (cause and effect).*

Pre- early level Numeracy and Mathematics

	Curriculum Organisers	Experiences and Outcomes for planning learning, teaching and assessment	Milestones to support practitioners' professional judgement
Number, money and measure	**Estimation and rounding**	I am developing a sense of size and amount by observing, exploring, using and communicating with others about things in the world around me. *MNU 0-01a*	• Shows a recognition of one, none and lots in a range of practical contexts • Shows recognition of more or less in a range of practical contexts
	Number and number processes including addition, subtraction, multiplication, division and negative numbers	I have explored numbers, understanding that they represent quantities and I can use them to count, create sequences and describe order. *MNU 0-02a* I use practical materials and can 'count on and back' to help me to understand addition and subtraction, recording my ideas and solutions in different ways. *MNU 0-03a*	• Participates in nursery rhymes and songs which involve an introduction to number • Calls out/demonstrates an awareness of numbers that come next in a familiar sequence • Recognises some familiar numbers within the environment • Carries out familiar tasks that involve one to one matching • Recognises and/or uses the sequence of 1,2, 3 to lead into or out of an activity • Says or signs the number words in order • Recognises and identifies some numerals • When asked 'how many?', recognises that they should respond with a number • Follows along a sequence of numerals while communicating the words • Begins to show one-to-one correspondence by indicating (e.g. by pointing) at each item and/or reciting the appropriate number words • Uses counting to accurately identify 'how many?' there are in a small group of items • Gives a requested number of items in a practical setting

			• Adds one more and/or takes one away from a group of items on request • Identifies when there is none left • Demonstrates an understanding of first and last in a familiar routine
	Multiples, factors and primes	There are no experiences and outcomes at this level.	There are no experiences and outcomes at this level.
	Powers and roots	There are no experiences and outcomes at this level.	There are no experiences and outcomes at this level.
	Fractions, decimal fractions and percentages including ratio and proportion	I can share out a group of items by making smaller groups and can split a whole object into smaller parts. *MNU 0-07a*	• Splits an item into smaller pieces • Puts smaller pieces back together to make the whole • Takes part in distributing a collection of items between a group • Distributes items one at a time
	Money	I am developing my awareness of how money is used and can recognise and use a range of coins. *MNU 0-09a*	• Exchanges an item for something else • Exchanges a range of medium including coins, cards or other forms of money in exchange for something • Handles a range of real money that demonstrates an awareness of money, e.g. puts it into a purse or a till or other relevant item. • Finds coins in a group of mixed items • Matches coins or notes that are the same • Sorts some coins from other coins • Identifies some coins

			• Uses language of money in a real life situation, e.g. pay, coin, change, buy, pounds, pence
	Time	I am aware of how routines and events in my world link with times and seasons, and have explored ways to record and display these using clocks, calendars and other methods. *MNU 0-10a*	• Demonstrates awareness of start and finish by responding to a start and finish signifier such as a tune, object, etc. • Moves on to doing something different in response to a simple timetable (e.g. objects, photos, symbols) • Follows a sequence of activities in response to a timetable (e.g. objects, photos, symbols) • Identifies that there are different activities that happen at different times of the day and different days of the week • Shows an awareness that there are different days of the week • Shows some awareness that there are different features associated with different seasons such as weather, clothes, festivals • Shows some understanding of time passing, e.g. through waiting for a timer, or waiting for a turn or activity • Shows some awareness of the language of time, e.g. before, after, time for, tomorrow, today, afternoon, morning, night, now, next, finished and wait

Shape, position and movement	**Measurement**	I have experimented with everyday items as units of measure to investigate and compare sizes and amounts in my environment, sharing my findings with others. *MNU 0-11a*	• Explores different items in their world in relation to size, weight, length and capacity through a variety of actions, e.g. filling and emptying • Identifies items by size and/or amount, e.g. big and small, heavy and light, full and empty, from a choice of two • Matches items by size and length • Sorts items by size and/or amount, e.g. big and small, heavy and light, full and empty • Responds to directions by more or less •
	Mathematics – its impact on the world, past, present and future	There are no experiences and outcomes at this level.	There are no experiences and outcomes at this level.
	Patterns and relationships	I have spotted and explored patterns in my own and the wider environment and can copy and continue these and create my own patterns. *MTH 0-13a*	• Finds familiar items that go together and matches them • Responds to a change in a familiar pattern or routine
	Expressions and equations	There are no experiences and outcomes at this level.	There are no experiences and outcomes at this level.

	Properties of 2D shapes and 3D objects	I enjoy investigating objects and shapes and can sort, describe and be creative with them. *MTH 0-16a*	• Investigates the properties of shapes and objects through play activities such as posting shapes, stacking objects, inserting puzzle pieces • Uses objects in a way that demonstrates an awareness of their properties • Matches real life 3 D objects • Matches 2 D shapes • Recognises the names of some simple shapes, e.g. circle, star, square
	Angle, symmetry and transformation	In movement, games, and using technology I can use simple directions and describe positions. *MTH 0-17a* I have had fun creating a range of symmetrical pictures and patterns using a range of media. *MTH 0-19a*	• Demonstrates an understanding of simple positional language such as in, on, under, up and down • Joins in familiar movement games and activities • Follows some simple directions within familiar movement games and dance, e.g. turn around

Information handling	**Data and analysis**	I can collect objects and ask questions to gather information, organising and displaying my findings in different ways. *MNU 0-20a* I can match objects, and sort using my own and others' criteria, sharing my ideas with others. *MNU 0-20b* I can use the signs and charts around me for information, helping me plan and make choices and decisions in my daily life. *MNU 0-20c*	• Collects or chooses a group of objects that share one property • Matches specific objects to other objects, pictures or symbols • Sorts a group of objects using a given criteria • Uses signs/symbols/pictures/objects of reference to help me plan and make choices
	Ideas of chance and uncertainty	There are no Experiences and Outcomes for this level.	There are no experiences and outcomes at this level.

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