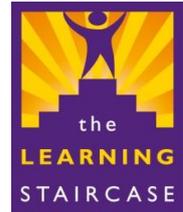# Steps and Dyslexia
(and other processing difficulties)

Steps is designed to be used in a variety of contexts. It is used as a whole-class resource to support class-based literacy teaching, ESOL teaching and language development. However, it is also effective in a remedial setting with learners who have processing difficulties such as dyslexia. Learners in this category typically have a variety of processing weaknesses which may prevent them from developing literacy skills.

The Big Five (typical pattern of processing difficulties in dyslexia)

Phonological Awareness	• Phonemic awareness • Onset + rime • Rhyme • Syllabification • Word retrieval • Auditory discrimination
Visual Perception	• Visual discrimination • Tracking • Perceptual organisation • Visual recognition • Irlen Syndrome
Sequencing	• Visual sequencing • Auditory sequencing • Sequencing of ideas • Planning work
Memory	• Visual memory • Auditory memory • Kinaesthetic memory • Working memory
Motor Development	• Gross motor skills • Fine motor skills • Proprioception

Processing Skills in Literacy

Although these processing skills are necessary for all learners, research shows that dyslexic learners are likely to have specific weaknesses in some or all of the above areas. They therefore typically need a much stronger emphasis on developing these skills and need to be taught how to apply them in context.

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However, there are further aspects which are important, particularly for learners with literacy difficulties, such as dyslexia. These learners often need significantly more reinforcement. Research shows that a non-dyslexic learner needs typically between 4 – 10 exposures to a word to fix it in long-term memory. A dyslexic learner, on the other hand, can need 500 – 1300 exposures to the same word.

Phonological Awareness

There is considerable research from all over the world into the importance of different aspects of phonological awareness. Phonological awareness is often a major weakness in learners with dyslexia or similar processing difficulties.

Background information

Phonological awareness is often referred to as phonemic awareness, but there is a crucial difference between these terms.

The term 'phonemic awareness' comes from the word 'phoneme', which is a single sound in language. This includes the following individual skills:

- Identification of initial, final and medial sounds in word
- Segmentation (breaking words into individual sounds
- Blending (blending individual sounds to make words)
- Phoneme transposition (ability to 'swap' sounds)

The term 'phonological awareness' comes from the word 'phonology', which is the sounds and sound patterns of language. Phonological awareness is therefore a broader term than phonemic awareness and encompasses the following:

- All of the above aspects of phonemic awareness *PLUS*
- Onset + rime
- Rhyme
- Syllabification
- Word Retrieval
- Auditory discrimination

Phonological awareness is purely processing the sounds and sound patterns in language, not understanding how those sounds map onto text, which is referred to as **phonic or orthographic knowledge**. However, it is an essential precursor to phonic knowledge. There is no point trying to learn what letters represent what sounds if you are unable to process those sounds in language in the first place.

How does Steps develop Phonological Awareness?

The following activities are specifically designed to develop phonological awareness. Some of these activities only involve processing the sounds or sound patterns themselves (phonological awareness) and some make the link with the written word (phonological awareness + phonic knowledge).

Chunks – onset + rime awareness
Word Building – onset + rime awareness
Initial Sounds – onset + rime awareness, phoneme transposition
Sound Tiles – phonemic awareness + phonic knowledge
Sound Boxes – phonemic awareness + phonic knowledge
Vowel Sounds (game) – phonemic awareness, auditory discrimination and phonic knowledge
Clear the Skies (game) - phonemic awareness, auditory discrimination and phonic knowledge
Vowel Ladder (game) – phonemic awareness, auditory discrimination, phonic knowledge, blending, decoding/encoding skills
Alphabet (General Section) – phonic knowledge, phonemic awareness
Spelling (General Section) – auditory discrimination, phonemic awareness, decoding/encoding skills

Phonemic/Phonological Awareness Research

"The majority of preschoolers can segment words into syllables. Very few can readily segment them into phonemes. The more sophisticated stage of phoneme segmentation is not reached until the child has received formal instruction in letter-sound knowledge." Predicting reading and spelling difficulties (Snowling & Backhouse 1996)

"The best predictor of reading difficulty in kindergarten or first grade is the inability to segment words and syllables into constituent sound units (phonemic awareness)" Lyon, G. R. (1995). Toward a definition of dyslexia. Annals of Dyslexia, 45, 3-27.

"The ability to hear and manipulate phonemes plays a causal role in the acquisition of beginning reading skills". Smith, Simmons, & Kame'enui, 1998

The effects of training phonological awareness and learning to read are mutually supportive. "Reading and phonemic awareness are mutually reinforcing: Phonemic awareness is necessary for reading, and reading, in turn, improves phonemic awareness still further." Shaywitz. S. (2003). Overcoming dyslexia: A new and complete science-based program for reading problems at any level. New York: Knopf.

Visual Perception

There are a number of aspects of visual perception. Visual perception difficulties affect reading fluency in particular and mean that many learners remain slow, laboured readers for ever. Learners in this category typically benefit from using larger, sans serif fonts. They

may have particular difficulty with words which are visually similar (of/for, saw/was, three/there). If these learners do not develop instant visual recognition for words, they will never develop true fluency. If there main strategy for reading is decoding, they are also prevented from effectively following the sense of the passage, which has a detrimental effect on comprehension and other language skills.

How does Steps develop Visual Perception?

All of the activities which develop phonological awareness have some impact on visual recognition of words, since instant visual recognition also requires an understanding of phonic patterns/phonological awareness. However, there are a number of activities on **Steps** which specifically develop Visual Perception:
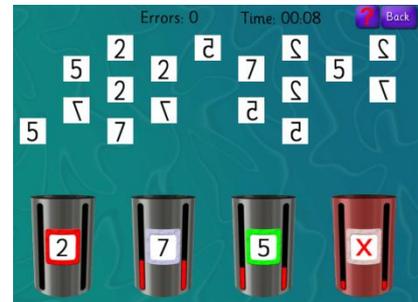
Find the word – visual recognition, decoding

Word Flash – visual recognition, development of occipito temporal

Sentence Builder – reading in context, visual recognition

Word Search – visual discrimination, pattern recognition, tracking

Spelling – phonemic awareness, phonic knowledge, visual memory, visual sequencing

Spelling Test - phonemic awareness, phonic knowledge, visual memory, visual sequencing

Drop – visual sequencing, visualization

Visual memory – visual and spatial memory, word recognition

Fireworks (game) – visual discrimination, tracking, pattern recognition

Snap (game) – perceptual organisation, visual discrimination

Blocks (game) – spatial awareness, hand-eye coordination, directionality, fine motor coordination

Pop the Balloon – spatial awareness of the alphabet, sequencing, keyboard awareness

Reversals (letters and numbers) – visual discrimination, directionality

**Alphabet Order** – tracking, visual discrimination, sequencing, working memory

Directions – directionality, spatial concepts

Perception – spatial awareness, perceptual organisation

Spelling (General) – visual discrimination, pattern recognition

Sequencing

Sequencing is a specific difficulty for dyslexic learners. Sequencing difficulties can affect visual processing, which causes confusions with similar words (of/for, saw/was, etc). It also affects auditory processing, with sounds being mis-sequenced. It can also affect sentence construction and planning skills for essays and other written work.
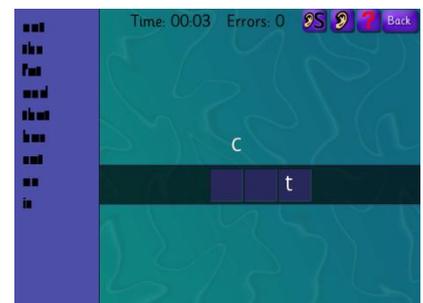
How does Steps develop Sequencing?

Sentence Builder – sequencing words to make a sentence, syntactic awareness

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Word Search – visual discrimination, pattern recognition, tracking
Spelling – phonemic awareness, phonic knowledge, visual memory, visual sequencing
Spelling Test - phonemic awareness, phonic knowledge, visual memory, visual sequencing
Drop – visual sequencing, visualization
Fireworks (game) – visual discrimination, tracking, pattern recognition, visual sequencing
Pop the Balloon – spatial awareness of the alphabet, sequencing, keyboard awareness
Alphabet Order – tracking, visual discrimination, sequencing, working memory
Word Grid – auditory sequential memory, working memory
Hangman (game) – ability to sequence letters and predict word structure
Letter Chunks (general section) – alphabet sequencing, including reverse sequencing
Number Chunks (general section) – number sequencing, including reverse sequencing
Number Grid (general section) – auditory sequential memory, working memory
Days and Months (General Section) – sequencing days of the week and months using visual and auditory sequencing
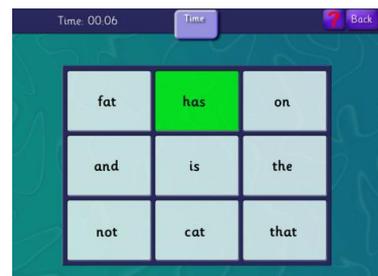
Memory

Memory is a problem for most learners with literacy difficulties, particularly dyslexic-type learners. There are several key aspects:

Visual memory

Weaknesses in visual memory affect the development of sight vocabulary. Learners in this category need significantly more exposure to text to fix words in to their long-term memory. Research indicates that a non-dyslexic learner only needs 4 – 10 exposures to a word to fix it into long-term memory, whereas a dyslexic learner may need 500 – 1300 exposures.

Auditory memory

There are two key aspects to this. Auditory sequential memory is the ability to remember a sequence of items/pieces of information. Working memory is the ability to retain information and simultaneously process it (as is necessary for taking notes).

Memory for information

This is obviously linked with the above aspects, but specifically refers to the ability to remember information such as verbal instructions or reading/listening comprehension questions.

Most of the activities on **Steps** develop memory in some way or other, since they are providing reinforcement of the words or spelling patterns. However, there are specific activities which prioritise memory skills.

How does Steps develop Memory?

In addition to the activities below, **Steps** incorporates automatic revision. On all of the course options, the computer has a revision unit, which automatically analyses the learner's errors in the previous 3 or 4 units and creates an individualized revision module.

Spelling – word memory, phonemic awareness, phonic knowledge, visual memory, visual sequencing

Spelling Test - phonemic awareness, phonic knowledge, visual memory, visual sequencing

Drop – visual sequencing, visualization, visual memory

Fireworks (game) – visual discrimination, tracking, pattern recognition, visual sequencing

Alphabet Order – tracking, visual discrimination, sequencing, working memory

Word Grid – auditory sequential memory, working memory

Hangman (game) – ability to sequence letters and predict word structure

Letter Chunks (general section) – alphabet sequencing, including reverse sequencing

Number Chunks (general section) – number sequencing, including reverse sequencing

Number Grid (general section) – auditory sequential memory, working memory

Word Memory – auditory sequential and working memory

Motor Development

The main thing aspect of motor development which affects literacy is, of course, fine motor control. Fine motor control is needed for handwriting and for mouse control or keyboarding.

How does Steps develop Motor Development?

Steps is not specifically designed to develop motor control as such, although there are plans for a touch typing course. However, there a few features which develop this aspect, including kinaesthetic memory (memory for movement). The workbook courses include a strong emphasis on handwriting and letter formation and the teaching method for high frequency/irregular words develops kinaesthetic memory.

Blocks (game) – spatial awareness, quick thinking, fine motor skills

Clear the Skies (game) – spatial awareness, mouse skills

Alphabet (reference) – kinaesthetic memory for letter formation, handwriting

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