Literacy Development

Ros Lugg

Key Questions

- Why do some learners struggle, but others don't?

- How can we stop learners falling through the gaps?

- What can we do to meet the needs of *all* our learners?

A key model developed by the USA National Reading Panel in 2000

Describes the progression of skills as reading develops.
- **Sequential**
- **Cumulative**

The 5 Big Ideas in Beginning Reading

- Comprehension — 5
- Vocabulary — 4
- Reading Fluency — 3
- Phonic Knowledge — 2
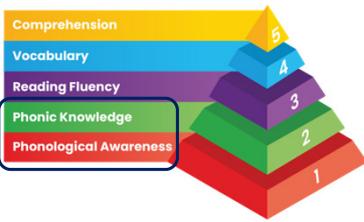- Phonological Awareness — 1

Slide 1

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· **Sequential**
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The 5 Big Ideas in Beginning Reading

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Vocabulary — 4
Reading Fluency — 3
Phonic Knowledge — 2
Phonological Awareness — 1

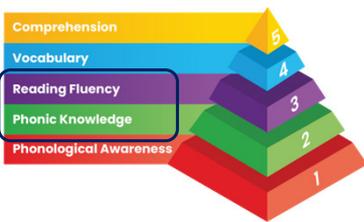Literacy Development
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Slide 2

A key model developed by the USA National Reading Panel in 2000

Describes the progression of skills as reading develops.
· **Sequential**
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The 5 Big Ideas in Beginning Reading

Comprehension — 5
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Phonological Awareness — 1

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Slide 3

A key model developed by the USA National Reading Panel in 2000

Describes the progression of skills as reading develops.
· **Sequential**
· **Cumulative**

The 5 Big Ideas in Beginning Reading

Comprehension — 5
Vocabulary — 4
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A key model developed by the USA National Reading Panel in 2000

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The 5 Big Ideas in Beginning Reading

Comprehension — 5
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Phonological Awareness — 1

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Literacy Methodology

How have we traditionally taught children to read?

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Whole Language

Recognising words as whole units.

Language should not be broken down into letters and letter patterns.

Instead, language should be a complete system of making meaning.

Emphasis on comprehension and context. Users should look for the context and pictures for help, rather than decoding.

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Whole Language

Based on the idea that we just need to build a visual memory for words as we are exposed to them.

Phonics Approach

bee

tree

Letters and letter patterns are the 'building blocks' of written language.

It is essential to understand how written language is structured, so learners can develop independent decoding and encoding skills – in other words, work words out for themselves.

sweets

eel

The Code

bee

tree

There is a 'code' for how we represent sounds with symbols (letters or letter patterns).

decoding = reading
(working out the sounds from the symbols)

h/ou/se

encoding = spelling
(representing sounds with symbols)

s _ _
ar t

Interesting research conclusions

60%

Will succeed with literacy regardless of method

40%

Need a more structured approach
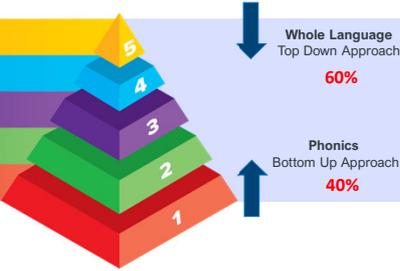
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Comprehension	5
Vocabulary	4
Reading Fluency	3
Phonic Knowledge	2
Phonological Awareness	1

USA National Reading Panel, 2000

Whole Language
Top Down Approach
60%

Phonics
Bottom Up Approach
40%

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Summary Statement

National Reading Panel, USA

"It is important to emphasize that systematic phonics instruction should be integrated with other reading instruction to create a balanced reading program…..

Phonics should not become the dominant component in a reading program, neither in the amount of time devoted to it nor in the significance attached."

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British **Dyslexia** Association

We are asking the Government to revise their guidance on teaching reading…. This guidance promotes the use of Systematic Synthetic Phonics as the sole method for teaching reading.

Instead, we are asking the Government to support teachers to teach a structured, cumulative and multi-sensory approach and a range of strategies alongside phonics instruction.

We know that SSP is a highly developed way to teach reading, and a critically important part of the beginning reading programme, but it has its limitations.

When SSP is used as the only method to teach reading, it does not work for up to 25% of children, particularly those with dyslexia.

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So why do some learners struggle?

"She's got a reading problem."

"She's got a spelling problem."

Don't look at the symptom – identify the cause!

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Processing and perceptual skills – the Big Five

Motor Development

Literacy Development
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Handwriting Research

Children not only learn to read more quickly when they first learn to write by hand, but they also remain better able to generate ideas and retain information.

Processing and perceptual skills – the Big Five

Motor Development

Sequencing

Sequencing

Literally putting things in order:

Letters in a word

Words in a sentence

Ideas in a story

Stages in a plan

Processing and perceptual skills – the Big Five

Motor Development

Sequencing

Phonological Awareness

Visual Perception

Phonological Awareness

or

Phonemic Awareness

Phonemes

Onset + Rime

Rhyme

Syllabification

Phonological Awareness

Rhyme

Rhyme

Rhyme Recognition – important for early literacy.

Particularly significant for developing **analogical transfer.**

Analogical transfer – the ability to:

Recognise patterns in words.

Apply that to work out unknown words.

Predictors of Reading Success
USA Study – 1960s

Research Question: What are the key predictors of reading success or failure at age 3-5 years?

Looked at a number of aspects, including:

- **Intelligence**
- **Speech/language abilities**
- **Attention span**
- **Motor skills**
- **Phonological processing**

Findings:

Phonological awareness is the key predictor of reading success for this age-group.

Predictors of Reading Success
Bryant & Bradley (1983)

Research Question: Which aspects of phonological awareness are the most significant?

Tested 400 4-5 year-old pre-readers on a range of phonological skills.

Tested them on reading and spelling 4 years later (aged 8-9)

Findings:

Rhyme recognition is the key predictor of reading success for this age-group.

Later studies

More recent research studies have identified phonemic awareness as being a crucial predictor.

However, this was at age 6 when children had already received phonological and literacy teaching.

Key point: Phonemic awareness is not a natural stage of phonological awareness. It is a result of correct literacy teaching.

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Important Quote

"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)

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Phonological Awareness

Rhyme   Syllabification

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Syllabification

Auditory Syllabification – the ability to break spoken words into 'chunks'.

rember

Syllabification Rules – how to break written words into syllables

---

Auditory Syllabification

= The ability to hear the beats (syllables) in a word.

Easy way to teach it:
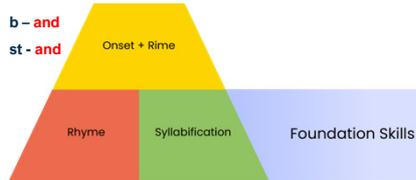
Hold your hand under your chin and say the word.

The number of times your chin touches your hand is the number of syllables.

Phonological Awareness

b – and
st - and

Onset + Rime

Rhyme   Syllabification   Foundation Skills

Slide 1

Rhyme or Rime?

f - eet

m - eet

sh - eet

tw - eet

str - eet

str | ing

onset — rime

rhyme = sound pattern

bed
head
said

rime = spelling pattern

bed
led
red

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Slide 2

Development of syllabification

str | ing

onset — rime

sentences → words

words → syllables

words → onset + rime

words or syllables → phonemes

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Slide 3

Onset + Rime

cat   hat   rat

Breaking words into two 'chunks' is significantly easier than breaking it into individual phonemes (sounds).

string

Anything between 2 and 6!

str

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Individual phonemes:
(sounds)   s - t - r - i - ng

Onset + Rime: str - ing

Onset + Rime

Breaking words into **onset + rime** is a natural stage of phonological awareness. Breaking words into **phonemes** only occurs as a result of literacy teaching.

The **onset + rime** stage is linked with later **orthographic mapping**.

Phonological Awareness

b – a – n - d
s - t – a – n - d   Phonemes

b – and
st - and   Onset + Rime

Rhyme   Syllabification   Foundation Skills

Phonological Awareness

Phonemes
Onset + Rime
Rhyme   Syllabification

Phonemic Awareness

Foundation Skills
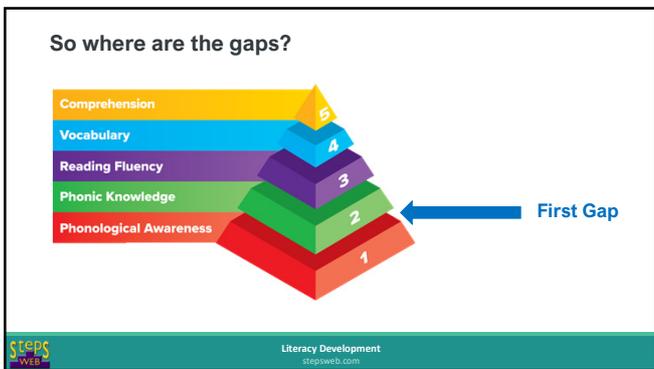
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Individual phonemes

Not a natural stage in the development of phonological awareness.

Dyslexic learners in particular will
struggle with this activity.

string

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So where are the gaps?

Comprehension — 5
Vocabulary — 4
Reading Fluency — 3
Phonic Knowledge — 2
Phonological Awareness — 1

First Gap

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Processing and perceptual skills – the Big Five

Motor Development

Sequencing

Phonological Awareness

Visual Perception

Visual perception – aspects related to literacy

- **Visual Discrimination**
- **Visual Memory**
- Visual-Spatial Relationships
- **Visual Sequential Memory**
- Visual Closure
- **Visual Figure-Ground**

Visual discrimination

The ability to notice and identify visual detail.

b / d   confusion   -   *is the word '**big**' or '**dig**'?*

© The Learning Staircase Ltd, 2021

Visual Memory

An average reader needs only 4-10 exposures to a word to fix it into long-term memory.

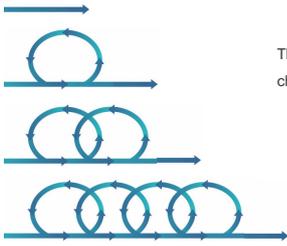A dyslexic learner may need 500 – 1300 exposures!

(Bateman, B., 1991)

The Circular Progression

The importance of constantly going back, re-checking and, if necessary, re-teaching

---

th → sh → ch → ee → ai
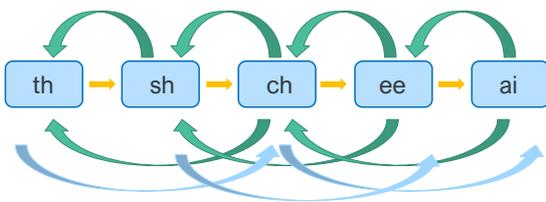
Visual Figure-Ground

The ability to identify visual detail from a 'busy' background.

Many readers – particularly those with dyslexia,
find it difficult to process visual detail with a busy
background.
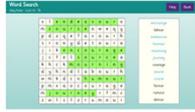
**Processing and perceptual skills
– the Big Five**

Problems with these are associated with:

**Phonological
Awareness**

**Visual
Perception**

Poor decoding and spelling

Poor sight vocabulary

**Processing and perceptual skills
– the Big Five**

**Motor
Development**

Sequencing

**Phonological
Awareness**

**Visual
Perception**

**Memory
(working)**

Memory

Visual memory

Visual sequential memory

Auditory sequential memory

Working memory

Long-term memory and retrieval

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Personal Observations!

Struggling learners often don't automatically understand memory strategies.

Therefore:

We need to specifically teach memory strategies.

We need to incorporate memory activities into our modern curriculum.

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Memory Strategies

Repetition

Chunking

Associating words with letters

Inner voice!

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Processing and perceptual skills – the Big Five

Motor Development

Sequencing

Phonological Awareness

Visual Perception

Memory (working)

Key phases of literacy development

Ehri, L. 1985

Logographic Phase

Typically 3-5 years of age

Logographic Stage

A young learner may be able to read a *tiny* number of very high frequency words or words with a particular significance - their own name, for example.

Only using visual recognition. This learner doesn't yet have the phonemic skills and phonic knowledge to decode words.

Won't be able to read unknown words.

Logographic Phase

Typically 3-5 years of age

Also likely to be confused with words of a similar shape.

David   Daniel

Key phases of literacy development

Ehri, L. 1985

Logographic Phase → Alphabetic Phase

Alphabetic Phase

Typically 6+ years of age

The learner is acquiring key skills and knowledge:

Phonemic Awareness

Phonic Knowledge

Using those skills to learn to **decode** (read) and **encode** (spell).

Phonemic Awareness

The awareness of individual sounds in words.

"Can you hear the sounds in cat?"   c - a - t

"What is the first sound in rabbit?"   r

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Phonemic Awareness

Alphabetic Stage

The ability to 'manipulate' individual sounds in words.

"Take the first sound away from cat and what do you get?"   -at

"Take away the 'c' and add 'b' instead. What do you get?"   bat

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Phonic Knowledge

Alphabetic Stage

Knowing what letter or letters go with each sound.

"What sounds can you hear in this word?"

"Let's see if we can write those sounds"

f | igh | t

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Phonic Knowledge

Alphabetic Stage

Much more complex than alphabet knowledge!

How many letters do we have?

26

How many sounds do we have?

44

Alphabetic Phase

Alphabetic Stage

So what can we expect a learner in this phase to be able to do?

Read unknown words – providing they're reasonably regular!

Write unknown words.

Alphabetic Phase

Alphabetic Stage

Errors are likely to be phonetically correct.

coff   c<u>ough</u>

Alphabetic Phase

Alphabetic Stage

Main reading strategy: conscious decoding

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Key phases of literacy development

Ehri, L. 1985

Logographic Phase → **Alphabetic Phase** → **Orthographic Phase**

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Orthographic Phase

Orthographic Stage

So what can we expect a learner in this phase to be able to do?

Be aware of the more complex phonic patterns and be able to use them for reading and spelling.

Recognise words automatically without having to consciously decode them.

(Ehri, L., 1998)

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Orthographic Phase

Orthographic Stage

How does this happen?

Competent 'decoders' start to acquire a memory for common patterns, which no longer need to be consciously decoded.

Once a new word has been decoded for the first time, the word or letter pattern is associated with (mapped to) similar patterns in long-term memory.

(Kilpatrick, D., 2015)

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Orthographic Phase

Orthographic Stage

This process is known as **Orthographic Mapping.**

Crucial for reading fluency and, hence, vocabulary acquisition and comprehension.

(Kilpatrick, D., 2015)

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Key phases of literacy development

Ehri, L. 1985

Logographic Phase → **Alphabetic Phase** → **Orthographic Phase**

Visual recognition – tiny number of words.

Ability to decode regular words.

Visual recognition of words without conscious decoding.

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Orthographic Phase

Orthographic Stage

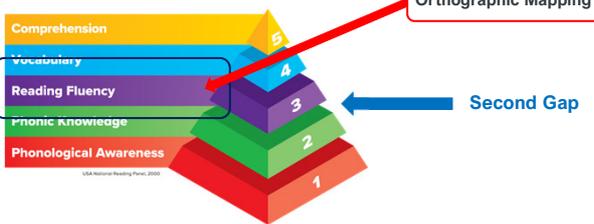**Key points:**

Orthographic Mapping is essential for reading fluency.

If you're still reading by a mainly decoding strategy, you can't effectively follow the sense of the passage.

Decoding is not fun!!!!!

So where is the second gap?
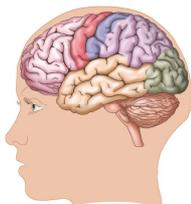
Orthographic Mapping

Comprehension — 5
Vocabulary — 4
Reading Fluency — 3
Phonic Knowledge — 2
Phonological Awareness — 1

USA National Reading Panel, 2000

Second Gap

Neurological Aspects

Overcoming Dyslexia (2005)
Sally Shaywitz

Left hemisphere brain activation

Left inferior frontal gyrus (Broca's area) – articulation and phonological processing

Parieto-temporal
- grapheme-phoneme conversion

Occipito-temporal
– visual and orthographic encoding (whole word recognition).
Visual Word Form Area

Broca's Area

Parieto temporal

Occipito temporal
Visual Word Form Area

Overcoming Dyslexia (2005)
Sally Shaywitz

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Neural Signature for Dyslexia

Overcoming Dyslexia (2005)
Sally Shaywitz

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Compensatory Systems

Non-impaired

Dyslexic

Overcoming Dyslexia (2005)
Sally Shaywitz

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Conclusion

Dyslexic Learners have:

An impaired occipito-temporal (**Visual Word Form Area**)

They therefore over-rely on the wrong areas:

Broca's area and parieto-temporal in left hemisphere
Right hemisphere areas

Overcoming Dyslexia (2005)
Sally Shaywitz

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Consequences

• Decoding areas (over)develop as instruction progresses.

• Wrong reading strategies being employed for fluency.

• Wrong areas of the brain being activated and developed.

Reading fluency never develops!

Overcoming Dyslexia (2005)
Sally Shaywitz

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Correct process

• Learner analyses and reads the word the first few times
    - using the decoding areas of the brain.

• Neural model of the word is formed
    - stored in the Visual Word Form Area.

• The word can now be recognised automatically *– without decoding!*

Fluency achieved!

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Understandable Question

*"How do I know when my student starts to use the **Visual Word Form Area** for Orthographic Mapping?"*

Research studies suggest that the **Visual Word Form Area** operates at around 150ms or faster.

It is now possible to measure this speed.

Visual Recognition Speeds by Age

Age	Low 0 – 19%	Low Average 20 – 35%	Average range 36 – 65%	High Average 66 – 80%	High 81 – 100%
5:00 – 5:11 yrs	700 – 800	600 – 700	450 – 600	350 – 400	50 – 300
6:00 – 6:11 yrs	600 – 800	450 – 550	300 – 400	200 – 250	50 – 150
7:00 – 7:11 yrs	550 – 800	400 – 500	250 – 350	150 – 200	50 – 100
8:00 – 8:11 yrs	450 – 800	250 – 400	150 – 200	100	50
9:00 – 9:11 yrs	350 – 800	200 – 300	100 – 150	50	-
10:00 +	300 – 800	150 – 250	50 – 100	-	-

Exploring the relation between visual recognition speed, teacher literacy assessment and age. Analysis of the StepsWeb Visual Recognition Speed Test for ages 5.0 – 8.9

Cowie S., Plimmer B., & Lugg R., 2017

Visual Recognition Test Results

Visual Recognition Test		
Date Taken	Result	Summary
16 Nov 2022	50ms	Age Appropriate ❓ ❌
17 Jun 2020	150ms	Low Average ❓ ❌
29 May 2019	750ms	Low ❓ ❌

Note: For this test, a lower score is better. It represents the amount of time a student needed to look at an item to visually recognise it. Test results range between 50ms and 800ms.

Automatic Analysis

Profile

Level 7

Revision 1B

Personal Details
Date of Birth: 20 Apr 2012

kind
kindness
weak

Learning Information
Course Position: Level 7 - Revision 1B
Accent: en-NZ
Mode: Focus
Weekly Goal: 20
Medal Required: Silver (school setting)
Word Flash Delay: 200ms
Word Grid High Score: 3
Total Diamond Medals: 11
Total Gold Medals: 437
Total Silver Medals: 233

weakness
cheerful
cheerfulness
happy
happiness
damp
dampness

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Developing Visual Recognition Speed

Not complicated – Plenty of exposure to words!

Creating and reinforcing the neural images of those words.

Practising retrieving and recognising those neural images using the Visual Word Form Area.

Reading

Re-reading!

Word games

Writing

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Developing Visual Recognition Speed

Word Flash   Help   Back

hand
sprang
black
splash
flash
grab
cramp
stamp
crash
lamb
stand
back

Pass

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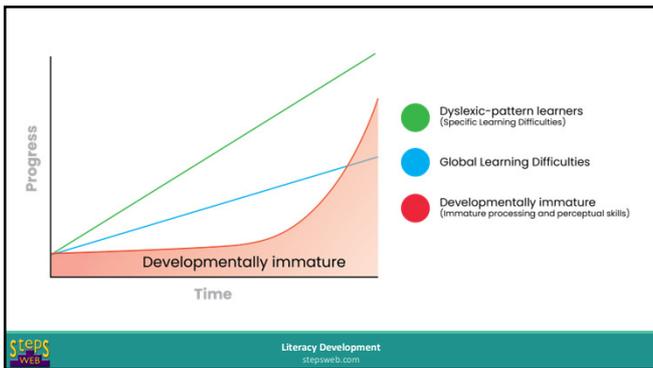

Developing Visual Recognition Speed

Speedreading
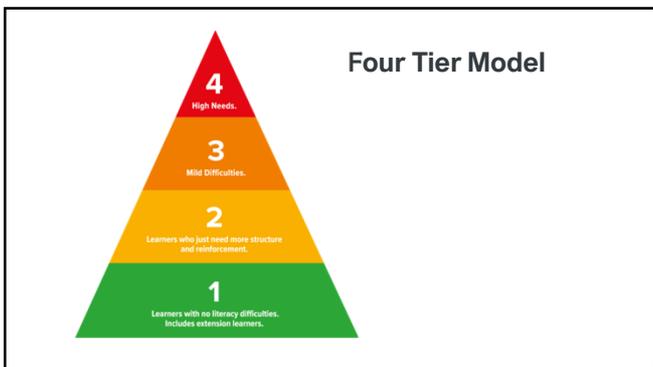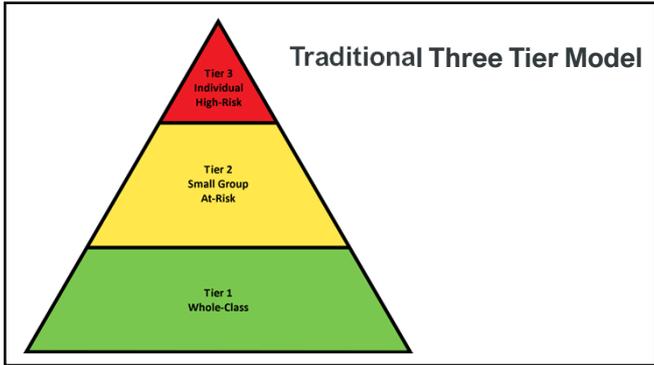
Tuesday	main	month	said	wait	Sunday	stain
again	Monday	week	old	Thursday	chain	sail
paid	Friday	train	snail	rain	mail	Wednesday
Saturday	nail	year	waited	stain	weekend	again

Times:

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Dyslexic-pattern learners
(Specific Learning Difficulties)

Global Learning Difficulties

Developmentally immature
(Immature processing and perceptual skills)

Progress

Developmentally immature

Time

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Four Tier Model

4 High Needs.

3 Mild Difficulties.

2 Learners who just need more structure and reinforcement.

1 Learners with no literacy difficulties. Includes extension learners.

Traditional Three Tier Model

Tier 3
Individual
High-Risk

Tier 2
Small Group
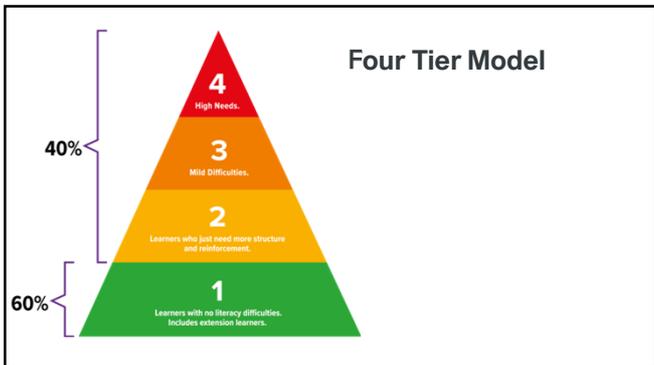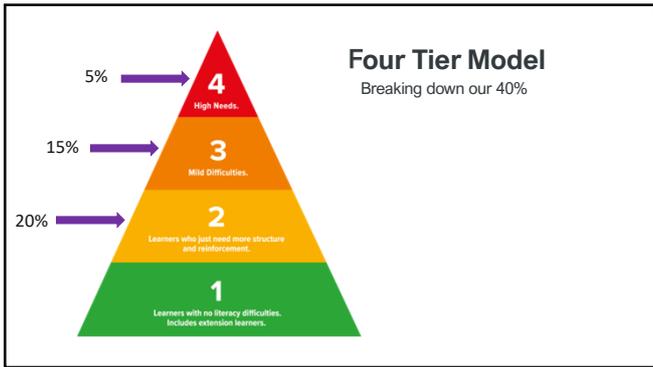At-Risk

Tier 1
Whole-Class

How does this map onto our 60/40 split?

60%

Will succeed with literacy
regardless of method

40%

Need a more structured
approach

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Four Tier Model

4
High Needs.

3
Mild Difficulties.

2
Learners who just need more structure
and reinforcement.

1
Learners with no literacy difficulties.
Includes extension learners.

40%

60%

Four Tier Model
Breaking down our 40%

5% → 4 High Needs.
15% → 3 Mild Difficulties.
20% → 2 Learners who just need more structure and reinforcement.
1 Learners with no literacy difficulties. Includes extension learners.

"90% of children with reading difficulties will achieve grade level in reading if they receive help in the 1st grade."

"75% of children whose help is delayed to age 9 or later continue to struggle throughout their school career."

(Vellutino, Scanton, Sipay, Small, Pratt, Chen & Denckla, 1996)

Huge drain on our resources!

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What the 40% need:

Literacy progression – not a spelling programme.

Every word seen and used in context.

Structured progression, which includes:

Comprehension 5
Vocabulary 4
Reading Fluency 3
Phonic Knowledge 2
Phonological Awareness 1

USA National Reading Panel, 2000

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But also:

A structure which enables every learner to work at his or her own speed and level.

Individualized reinforcement to cater for struggling/dyslexic learners – up to 1300 exposures, if necessary!
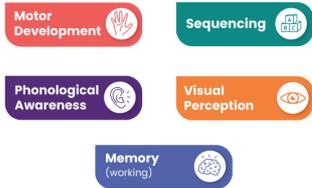
Transfer between online/computer work and written work.

And more specifically:

The right help and support to develop the core underpinning processing and perceptual skills needed for literacy:

Motor Development

Sequencing

Phonological Awareness

Visual Perception

Memory (working)