## Flying Start to Literacy: Phonics

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The research underpinning the development of Flying Start to Literacy: Phonics focuses on oral language, vocabulary, phonological awareness, phonics and morphology, vocabulary, comprehension, and fluency.

## Oral language

Language awareness is an important first step in phonics teaching.

Students' oral language skills in the preschool period are among the most powerful predictors of their success in learning to read (Dickinson, Golinkoff \& Hirsh-Pasek, 2010). Oral language development is facilitated by language practices that introduce students to emergent forms of academic language (conceptual talk), as well as listening to and learning from their own language practices (interactive talk) (Hadley, Barnes, \& Hwang, 2022).

Students in kindergarten and in the early years of school learn through oral language-they learn about how language works (Halliday, 2004). Shared book reading increases oral language development when teachers provide high-quality feedback and extend on students’ responses (Hindman, Wasik \& Bradley, 2019).

A systematic review of 54 studies of oral language and teaching (Hadley, Barnes \& Hwang, 2022) found that early childhood teachers can support students' oral language development by using strategies tailored to specific settings, including the use of conceptual talk during shared book reading, and listening and responding to students during play and in small group settings. Oral language awareness of rhyme, repetition, and word play is linked to early reading and writing development. Written language is a symbol system that is different from everyday spoken language (Hill \& Launder, 2010). Language awareness is an important first step in phonics teaching.

## Vocabulary

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Vocabulary-understanding word meanings-is closely linked to comprehension. A students' vocabulary expands before school and all through later schooling (Nichols \& Hill, 2020). By the time students start school, many know more than 5000 words. As their vocabulary develops, they learn common everyday words for colors, animals, tools, actions, and feelings. While everyday words are important, more rare words are found in children's storybooks, information books, songs, nursery rhymes, and chants. Children's literature compared to everyday talk has more extended vocabulary or rare words (Massaro, 2015).

The three-tier vocabulary typology was first developed by Beck and McKeown (1985). Tier-1 words express basic, generic concepts, while Tier-2 words provide greater precision and a wider range of meaning possibilities. For example, bad is a Tier-1 word, while deplorable is Tier-2, since it allows for greater specification and fine-tuning of meaning.

The final category, Tier-3 words, are utilized in contexts of specialization and specific domains, for instance in scientific communication, and include words such as opprobrious. The three-tier classification of everyday, academic, and specialized vocabulary has been widely adopted across multiple studies (Gillon et al., 2019; Justice, Meier \& Walpole, 2005).

Vocabulary development within early literacy programs was implemented in New Zealand where each week a storybook was used (5-7 minutes per day) to increase vocabulary knowledge (Gillon et al., 2019). Each week, four Tier-2 words were selected from the storybook. The findings showed that using shared reading with elaboration of vocabulary was successful in extending students' vocabulary. The shared reading technique was effective when vocabulary meanings were elaborated compared to just hearing the words without elaboration.

## Phonological awareness

The best outcomes for reading and writing occur when phonemic awareness and phonics are integrated.

In the past, phonics was taught in isolation from phonemic awareness; however, the best outcomes for reading and writing occur when phonemic awareness and phonics are integrated (Gillon, 2018; Kilpatrick, 2015). Phonological awareness undergirds or supports phonics and 'phonemic skills are foundational for fluent, word-level reading in alphabetic writing systems' (Kilpatrick, 2020, p. 15). It is conscious attention to the sounds in spoken language.

Phonological awareness 'is an umbrella term that refers to the ability of children to manipulate and identify any size unit within the spoken word' (Mesmer, 2019, p. 46).

Knowledge of these letter-sound mappings is crucial for literacy development because it helps students to store pronunciations and spellings in their memory, and to decode and spell new words.

The hierarchical levels of phonological awareness are syllable, onset-rime, and phonemes (Gillon, 2018). The word can be one or more syllables and can also be a compound word like blueberry. Phonological awareness considers syllable awareness and onset-rime awareness, as well as the more familiar phonemic awareness. It is concerned with the smaller units within a word.

For example, a word such as basket is composed of progressively smaller units: It has one stressed element basket. At the syllable level, there is a strong or stressed syllable (bas) and a weak or unstressed syllable (ket). Each syllable can be divided into an onset (the consonant or consonant cluster that precedes the vowel) and a rime unit (the vowel and the following consonants in the syllable). The onset-rime can be further segmented into individual speech sounds or phonemes, such as /b/, the first sound in basket.

## Syllable awareness

Syllable awareness is the awareness that words can be divided into syllables. There are three principles for syllable division in research investigating students' spelling development (Gillon 2018). Each syllable in a word contains a vowel (or vowel sound, such as the letter $\mathbf{y}$ making the long /ē/ vowel sound in baby). Syllable division follows the stress pattern of a word, with as many consonants as possible beginning a stressed syllable. For example, patrol
is divided as pa-trol and not pat-rol. Syllables are divided to ensure that consonants that cannot be clustered together in English do not begin or end in a syllable. For example, only is divided $\mathbf{o n - l y}$, not $\mathbf{0}-\mathbf{n l y}$ or $\mathbf{~ o n l}-\mathbf{y}$ because $\mathbf{n l}$ is not a regular cluster in English.

There are many activities that can be used for syllable awareness (Gillon 2018, p 5).
$\square$ Syllable segmentation: Say a word and say the syllables in drumbeats or tap them out. For example, el-e-phant.
$\square$ Syllable blending: Say the syllables in a word slowly. Ask students to repeat the syllables and then put them together. For example, kit-ten, kitten; ba-by, baby.
$\square$ Syllable identity: Say two words that have a similar syllable and ask which syllables are the same. For example, compete and compare.
$\square$ Syllable deletion: Say a word and then ask students to repeat the word, but to delete a syllable. For example, feather- delete fea.

## Onset-rime awareness

Words and syllables can be divided into onset and rime. In the word cat, $\mathbf{c}$ is the onset and at is the rime of the syllable. In the word start, st is the onset and art is the rime of the syllable. The most common task for onset and rime is to ask students if words rhyme.

Many activities target onset-rime awareness (Gillon 2018, p. 6).
$\square$ Spoken rhyme detection: Say two words that rhyme such as ship and dip and ask students if the words rhyme.
$\square$ Rhyme oddity tasks: Say three words such as fish, dish, and hook and ask which word does not rhyme.
$\square$ Spoken rhyme generation: Say a word such as bat. Ask students to say words that rhyme with bat.

Changing or identifying a sound in an onset-rime activity requires phoneme (phonemic) awareness.

## Phonemic awareness

A phoneme is the smallest unit of sound that influences the meaning of a word. For example, the word ship has three phonemes, $/ \mathrm{sh} / / \mathrm{i} / / \mathrm{p} /$. If any of these phonemes is changed, a new word or non-word is created. For example, change $/ \mathrm{sh} /$ to $/ \mathrm{ch} /$ and you have chip. Change $/ \mathrm{i} /$ to $/ \mathrm{o} /$ and the word is shop. Change $/ \mathrm{p} /$ to $/ \mathrm{n} /$ and the word is shin.

Many activities target phonemic awareness (Gillon 2018, p 7).
$\square$ Beginning sound awareness: Which word has a different first sound: bed, bus, ball, or cat?
$\square$ Phoneme matching: Which word starts with the $/ \mathrm{k} /$ sound as in cat: dog, cut, or mat?
$\square$ Phoneme isolation: Tell me the sound that you hear at the beginning of the word dog.
$\square$ Phoneme blending: What word do these sounds make when blended: /s/ $/ \mathrm{u} / \mathrm{n} /$ ?
Phoneme deletion: Say cake. Say cake again, but don't say /k/.
Phoneme segmenting: How many sounds can you hear in the word hit?
There are 41 phonemes in standard English ( 25 consonants and 16 vowels) (Gillon 2018, pp. 228-229). There are many dialect differences, particularly in the pronunciation of vowel sounds.

Phonemic awareness takes place before school and continues through kindergarten and first grade (Kilpatrick, 2016). More advanced phonemic awareness involving phoneme manipulation within words continues to develop through third and fourth grades.

## Phonics

Phonics is the sound-letter correspondences, spelling rules, and morphology taught in a sequence from simple to complex.

Phonics is the sound-letter correspondence for reading and writing. This section addresses concepts relating to phonics teaching, such as stages in alphabetic development, orthographic mapping, morphology, and the scope and sequence for teaching phonics. Orthographic mapping is the ways letters/graphemes and sounds/phonemes connect so that words can be identified. The scope and sequence for teaching letters and sounds is important as the sequence moves from simple letter-sound relationships to more complex letter sounds.

## Stages in alphabetic development

Students learn that each letter symbol has a letter name and a letter sound.


Figure 1: The symbol, sound, and letter name triangle

Students learn both the uppercase and lowercase letter symbols. The alphabetic letter order is important for organizing class names, materials, books, dictionaries, and more. Alphabet friezes and picture cards need to use pictures associated with the letter sound. Mesmer (2019) writes that regarding short vowels, make sure the picture starts with a clear short vowel sound. For example, not orange as that is an /or/ sound. Consonants need a clear consonant sound, not a digraph (sh, ch, th) or adjacent consonants (gr, bl, br) (Mesmer (2019), p. 101).

When learning phonics, students pass through overlapping stages known as pre-alphabetic, partial alphabetic, alphabetic, and consolidated alphabetic phases (Ehri, 1995). Many students beginning reading are at pre-alphabetic and/or partial alphabetic stages. In the beginning in the pre-alphabetic phase, students recognize icons for words such as MacDonalds.

In the partial alphabetic phase, students demonstrate emerging use of grapheme-phoneme or letter-sound connections. This is known as phonetic cue reading, but usually, the connections are incomplete or unreliable. Students in this phase often use the first letter sound, along with the context, to guess unfamiliar words.

In the full alphabetic phase, the reader attends to every letter in every word. Words are accessed by converting letters into sounds and words. This phase is dramatically more reliable than phonetic cue reading. A student in this phase has a working knowledge of most letter-sound correspondences, has phonemic awareness, decodes sequentially and often slowly, and uses decoding skills to read unfamiliar words. This occurs usually in late kindergarten and the
first grade. In the consolidated alphabetic phase, students begin to use chunks to decode, rather than individual phonemes. Phonograms, or multi-letter spelling patterns, such as adjacent consonants, digraphs, and vowel combinations are consolidated in memory and recognized instantly, as are common word families, affixes, and other spelling rules. Syllables and morphemes (like plurals and past tense suffixes ing) are also recognized as chunks.

## Orthographic mapping

Orthographic mapping is used to decode words by using letter knowledge and phonemic awareness. Letter-sound knowledge and phonemic awareness are central to the orthographic mapping process (Miles \& Ehri, 2019, p. 63). It is basically how we add 'each entry' into our orthographic lexicon/sight vocabulary (Kilpatrick, 2020). Orthographic mapping in reading involves connecting something we already know (the word's pronunciation) to something we are trying to learn (the printed form of the word). This connection process occurs at the level of phonemes, given the alphabetic nature of our writing system. For example, orthographic mapping occurs when students view a sequence of letters on the page (orthography). They then translate the letters to phonemes (phonology), and blend those sounds to pronounce words.


Figure 2: Orthographic mapping based on Ehri (2014) The $<\quad>$ represents letters and the // represents sounds.

When students have developed phonological awareness and phonics knowledge, they can use this knowledge to read new words. This is known as the self-teaching hypothesis, and phonological awareness and phonics sequences are applied to new words that then become part of a student's long-term memory (Share, 2004). The self-teaching hypothesis relies on phonological recoding (letter-sound-word), not by learning thousands of words by memorizing the whole word.

Orthographic mapping and self-teaching are essential for fluent reading and writing. Studies show that from second grade onward, typically developing readers require only one to four exposures to a new word before it is firmly established in long-term orthographic memory (Share, 2004) and becomes effortlessly recognized thereafter. Students with weak phoneme awareness, however, do not have adequate anchoring points in their long-term memory to efficiently store the letter orders that represent spoken words.

Reading and writing orthographic features within words requires awareness of letter sequences, or clusters of letters within a word, rather than individual letters. For example, when students have high-orthographic awareness, they remember /augh/ as a whole unit (as in the word caught) as opposed to laboriously decoding each individual grapheme as $\mathrm{a}-\mathrm{u}-\mathrm{g}-\mathrm{-h}-\mathrm{t}$. These students are also highly aware that the letter ordering, or sequencing, within the cluster /augh/ is plausible, and that /uahgt/, for example, is not.

## Morphology

Morphemes are the meaningful units in words. Morphology deals with base words and adding prefixes and suffixes that change the meaning of the word. Most phonics scope and sequences leave morphological knowledge until the last stage of structural analysis. Phonics in the early stages focuses on one-syllable words: consonant-vowel-consonant (CVC) words, consonant-vowel-consonant-consonant words (CVCC) words, and consonant-consonant-vowel-consonant (CCVC) words. There are inflectional (grammatical) suffixes, however, that early students learn. For example, adding the suffix $\mathbf{s}$ to the end of a base word means plural: dog-dogs, egg-eggs, chick-chicks.

Young students frequently read and write words that change from present tense to past tense (for example, walk-walked, wait-waited). Reading and writing words with an ed suffix occurs in many early reading books, for example, The eggs cracked. Explaining the concept of a base word such as crack and adding a suffix such as ed can be understood by kindergarten students when carefully taught. They can find base words with ed in books they read. Using the correct terms such as base word and suffix and/or prefix is necessary. Derivational suffixes change a base word to a new word, for example, teach-teacher, kindkindness, good-goodness. Understanding these suffixes affects comprehension or word meanings.

There is not a list or sequence of morphology. Shanahan (2018) recommends that morphology is linked to the books that students read. Simple but useful suffixes for the early years are $\mathbf{s}$, ed, and ing. Add ing means teaching a spelling rule such as doubling the final consonant in a base word consisting of consonant-vowel-consonant letter structure (for example, digdigging).

Students meet compound words and words with more than one syllable in children's literature and shared reading of big books. Many students are fascinated by etymology or where words originate, such as pandemic: pan means all people and epidemic means disease affecting many people.

## Scope and sequence

The phonics scope and sequence is a systematic approach to content to be taught. The scope is what and the sequence is when (Mesmer, 2019, p. 49). A sequence ensures that all the letter sounds are taught. The scope has to do with how much time is spent on the content of each letter sound. In the early stages, some teachers teach two or three letter sounds each week. Some schools proceed slowly, while others teach all the letters of the alphabet quickly.

In the beginning in the first year of kindergarten, the sequence of letters taught is based on letter frequency and visual contrast. However, many students know letter names and sounds, and it is necessary to assess each student's knowledge to plan for teaching. Some students have confused knowledge, mixing up the letter name with the sound. Some students need more time to consolidate learning. In the beginning stages of learning the 26 letters and sounds, revision and practice activities are required with small group and pair work. This is where the students learn the short vowels.

In the next stage, double letters (ff, ss, II) and consonant digraphs ( $\mathbf{s h}$, ch, ck, th) are introduced. Next, long vowels made with various letter combinations, such as the long $/ \overline{\mathrm{a}} /$ vowel sound made with ai and ay, and the silent $\mathbf{e}$ are taught.

The more complex vowel sounds like /or/ as in born and /e/ as in bread come in the later stages. In the later stages, each vowel combination can take a week of more. The pacing or sequence is dependent on the students' knowledge (see the scope and sequence in Mesmer, 2019, pp. 88-89 \& pp. 182-184).

Most phonics programs follow a similar scope and sequence. In synthetic phonics approaches, the term adjacent consonants is used instead of consonant blends. The term consonant blend is not used as all phonemes are blended and segmented in word identification.

## High-utility words and high-frequency words

High-utility words are useful words that are not yet decodable.

High-utility words are useful words for reading and writing but are not yet decodable for the student. Over time, 'sight words' and 'high-frequency words' (Dolch and Fry) became confused, and the idea that high-frequency words had to be learned as whole words became widely accepted. In a critical examination of high-frequency word lists, Miles, Rubin, and Gonzalez-Frey (2018) found many words were regularly spelled and some were temporarily irregularly spelled. Many words on the Dolch and Fry lists can be quickly decoded, for example: and, as, in, not, and it.

Some words such as no, go, so and she, he, me, and we are temporarily irregularly spelled until students learn the spelling patterns for long vowels. Words such as could, should, and would are often listed as irregularly spelled, but the oul makes the sound $/ v /$ as in book. There are some words that remain permanently irregularly spelled such as was, one, two, of, the, and $\mathbf{a}$, but is it a small percentage of high-frequency words.

Of the first words on the Fry list of 25 words, 11 (44 percent) are regularly spelled, seven (28 percent) temporarily irregularly spelled, and seven ( 28 percent) permanently irregularly: a, are, have, of, the, to, and was (Miles et. al., 2018). Even in the permanently irregularly spelled words like have and was, there are several letters that match regular phoneme representation.

## How to teach high-utility words

To teach high-frequency words, Miles et al., (2018) suggest using several kinds of sensory input where students are asked to say each phoneme in a word, tap it out on their arms, and watch as the teacher spells the word on a whiteboard. They then practice using plastic tokens and a grid of boxes (like Elkonin boxes) and write the letters in the words using markers. Teaching high-utility words involves orthographic mapping using the modified Elkonin boxes activity sheet.


Figure 4: Sound-letter chart (based on Miles et al., 2018, p. 723-725)

Using a modified Elkonin box as a sound-letter chart, a mark is placed in a box in the top row for each sound. Then the letters that represent each sound are written in in the bottom row, and the word is pronounced. For example: the word at has two sounds /a/ /t/.

| $\cdot$ | $\bullet$ |  |  |
| :---: | :---: | :---: | :---: |
| a | t |  |  |

Figure 5: Sound-letter chart with the word at.

The word the is learned the same way. It has two sounds: /th/ /e//.

| $\bullet$ | $\bullet$ |  |  |
| :---: | :---: | :---: | :---: |
| th | e |  |  |

Figure 6: Sound-letter chart with the word the.

As students advance, more difficult but common letter patterns can be used. For example, words like light and night could even be compared to words that sound like them, such as kite and bite. Even a difficult word such as thought could be taught with words like brought and fought.

## Comprehension

Talking about what has been read using literal, inferential, and evaluative comprehension questions encourages students to deepen their understanding of the text.

The purpose of reading is to gain information. Comprehension-understanding what they are reading-is the goal of all instruction. Listening comprehension is developed through exposure to picture books, rhymes, chants, oral language stories, and shared book reading. Students' active participation in discussions and talk-intensive reading aloud supports their story comprehension. Providing students with opportunities to talk enhances listening comprehension. (Lepola, Kajamies, Laakkonen \& Collins, 2023).

When teachers support the development of students' comprehension, they think about three factors: the reader, the text, and the activity (Hill, 2022). Teaching comprehension involves building oral language and vocabulary, encouraging active reading, and the explicit teaching of comprehension strategies.

Different text types prompt students to read in different ways-fiction is read for characters and plot, and informational books are read to find facts and to build concepts. Talking about what has been read using literal, inferential, and evaluative comprehension questions encourages students to deepen their understanding of the text. Comprehension activities need to encourage active reading with a consistent focus on strategies that involve students' thinking about their thinking. Comprehension activities can provide ways for students to learn cooperatively in pairs, groups, and whole classes to understand different types of texts.

## Fluency

Reading and rereading books, where the student has automatic word recognition, improves fluency.

Fluency in reading is generally considered to consist of two factors: word recognition automaticity and prosody (Rasinski, 2017). Word recognition automaticity is the ability of readers to decode words with so little cognitive effort that they can direct their cognitive energies to comprehension. If beginning readers invest too much of their cognitive energy in decoding words, less will be available for comprehension. Prosody refers to reading orally with appropriate expression and phrasing that reflects the meaning of the text. Research has demonstrated a strong correlation between prosodic oral reading and silent reading comprehension (Rasinski, 2017). Proficient readers read with expression, while less proficient readers often lack expression in their oral reading. This is important, as when struggling readers pause and try their hardest to work out a word, they lose meaning and motivation. Sometimes what they are reading is too difficult and sometimes they need more time to practice rereading the same book until it becomes easier and more familiar. Reading and rereading books where the student has automatic word recognition improves fluency.

## Summary

The research underpinning the development of Flying Start to Literacy: Phonics focuses on oral language, vocabulary, phonological awareness, phonics and morphology, vocabulary, comprehension, and fluency.
$\square$ Language awareness is an important first step in phonics.
$\square$ Vocabulary-understanding word meanings-is closely linked to comprehension.
$\square$ The best outcomes for reading and writing occur when phonemic awareness and phonics are integrated.
$\square$ Phonics is the sound-letter correspondences, spelling rules, and morphology taught in a sequence, from simple to complex.
$\square$ High-utility words are useful words that are not yet decodable or may be permanently irregularly spelled.
$\square$ Talking about what has been read using literal, inferential, and evaluative
comprehension questions encourages students to deepen their understanding of the text.

Reading and rereading books where the student has automatic word recognition improves fluency.

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