

Video 3: Word reading and spelling - Phonology

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A warm welcome, colleagues, to this third of this series of seven professional development videos focused on strand B of the Ontario Language Curriculum 2023. This video is the first of two that focuses on word reading and spelling, this one focusing specifically on the role of phonology. It should be understood in close relation to the preceding videos 1 and 2 and in close relation to video 4 that considers the role of morphology in reading and spelling. This video takes about 50-60 minutes to complete the content. There are then reflection points for you to consider after that. There are also follow-up videos and material you may find useful to help you understand the research and practice of teaching reading.

This session will cover 10 key points:

- 1. What is the Science of Reading (hereafter, the SoR)?**
- 2. What does evidence-based research tell us about the teaching of reading and spelling that I should know about as a teacher?**
- 3. Does reading and spelling develop on its own, or do I have to teach it?**
- 4. Practicalities – How do I teach reading and spelling using systematic and evidence-based instruction?**
- 5. Practicalities - When do I teach different aspects of reading and spelling?**
- 6. Practicalities - To whom and how much do I teach?**
- 7. How do I assess my teaching has been successful?**
- 8. How do I use this teaching to prevent difficulties? (documenting and monitoring)**
- 9. How does teaching of reading and spelling fit with my teaching of reading for meaning?**
- 10. How does teaching reading and spelling fit to my wider curriculum?**

By the end of this third session, you should have much of the essential information you need to be able to plan and deliver a strong word reading and spelling foundation using

what we know of the role of phonology (speech sounds) that will be of enormous impact to young people who otherwise struggle here to reach word reading accuracy and fluency.

1. What is the Science of Reading (SOR)?

The SOR refers to our understanding of how reading and spelling develops and operates, based on the accumulated evidence from research scientists working across a range of disciplines around the world over many decades. This accumulated work is sufficiently developed to provide us with some answers, at least at a high level, to many (but not all) questions about the best ways to teach and support reading and spelling acquisition and the teaching of reading and spelling for diverse learners. The SoR includes *the foundations of reading and spelling* that we have been learning about already in the first two sessions (namely phoneme awareness (PA), Grapheme-to-Phoneme correspondences (GPCs) and Phoneme-to-Grapheme correspondences (PGCs) and alphabet knowledge). The SoR speaks to word reading and spelling accuracy and fluency that we will cover here but also to aspects of wider oral language and its important effects in reading comprehension we shall consider later. The SoR has informed the development of the Ontario language curriculum 2023, and particularly many aspects of Strand B we are considering in detail in these seven videos, making the revised curriculum guidance, if followed closely, a powerful tool for positive educational change.

2. What does the evidence-based research tell us about the teaching of reading that I should I know about as a teacher?

The SoR as a discipline explores diverse scientific topics from the neuroscience of human eyes and brains to diverse spelling systems round the world, to computer simulations of acquisition, to students who read and spell well and those who struggle, and to expert reading and spelling in literate adults. For example, eye movement research has confirmed that even as skilled readers, we carefully look at and we process all words we read. We do not ‘skip’ or ‘guess’ but are very driven in reading by the print on the page. We do not read with a quick scan or sampling of the entire page. Instead, the SoR tells us that there is a very narrow MOVING WINDOW of visual attention to print around the specific word in a sentence we are currently focusing on to read in all spelling systems. In alphabets, this little window is just a few letters to the right of our direct focus and even fewer letters to the left of this focus. This tight spatial attention pattern is reversed in skilled readers of spelling systems like Hebrew that is read right to left. This small window moves as we focus on the next word in each sentence.

Spelling systems represent the spoken language (albeit in a very specific way). Languages also convey meaning. The SoR has also confirmed that spelling systems represent both phonology (speech sounds) and word meanings (vocabulary and morphemes). For this reason, there are two videos on reading and spelling. Part 1 here considers the role of phonology (speech sounds) and part 2 considers morphology – word meanings). The two videos and content are complementary, as reading and spelling likely involves both.

Crucially this body of SoR work has also informed carefully run direct studies of how children learn to read and spell best, and the sorts of classrooms, curriculae, policies, and teaching approaches that are most effective in teaching reading and spelling. This SoR includes multiple studies around the English-speaking world about how children learn to read best.

We will now consider in an accessible way just a little of this theory and research to help understand the Strand B content, the terms involved and how (AND WHY) this can help you understand the deliver effective reading teaching in your school.

Key SOR research on reading and spelling.

Our starting point here is the English spelling system – the system that a capable literate adult has largely ‘internalised’ in their brains over years, and which is the (potentially formidable) learning task facing young children at the start of their elementary school careers. English is a complex ‘opaque’ spelling system. It contains ‘regular’ words. These are words such as ‘sheep’ whose print -to-sound pronunciations follow cardinal GPC rules. English however also contains many words that are ‘irregular’ and that do not fully follow such GPC rules. For example, applying the cardinal GPC rules to ‘stomach’ yields a pronunciation something like ‘stow-mach’. English is thus harder to learn than many more ‘transparent’ spelling systems (e.g. Welsh Spanish German) where GPCs work much more reliably. English spelling thus needs attention over longer time (including in grades 2 and 3 not just K and grade 1) and a wide range of knowledge and strategies to learn it. Teachers should really be aware of the implications of this **task analysis**, that strongly informs elementary teaching and thus the revised Ontario language curriculum.

Let’s turn now to early experience. Even before school age, pre-kindergarten students are exposed to lots of ‘environmental print’, that is print in the ‘real world’ such as street signs and commercial logos for restaurants which they may seem to ‘read’. However, careful research shows that the apparent recognition of such environmental print does not really represent the start of true reading because trivial and irrelevant additions such as a thumb

print to a card with a common logo on it influences the apparent 'reading' such that of the thumb print is taken away but the word otherwise remains unchanged, students no longer read the word accurately, strategically-introduced letter changes in the logos are not noticed, and without distinct visual aspects of logo information, these same students cannot read the words. All 3 findings suggest pre-kindergarten students pay little early attention to letters, and hence they showed no generalizable learning. In our own work with pre-kindergarten students, we also looked at environmental print and phoneme awareness and early reading and spelling. Here we found that environmental print awareness was not related at all to their PA or GPC knowledge. Young students' ability to write their own name was, however, strongly related with early PA and GPCs. Early spelling may drive student's phonic insights for reading.

We have already learned in videos 1 and 2 about the intimate way PA helps drive, and is driven by, knowledge of GPCs. Ehri and Wilce (1985) showed beginner reading students stimuli such as LFT, SZRS, and JRF to represent words 'elephant', 'scissors' and 'giraffe' respectively over phonemically unrelated patterns such as 'WcB' for 'elephant'. The more capable early readers found the 'LFT' – 'elephant' stimulus reading much easier to remember than the 'WcB'-'elephant' type association, presumably due to the letters approximating the word pronunciation. The implication of this finding is that even early on in reading development, letter sounds act as consistent memory traces to help young students store print-to-pronunciation connections for words.

PA and GPCs can further be seen as a joint 'cutting edge' of learning about the spelling system when it comes directly to early reading and spelling. Stuart & Coltheart (1988) followed kindergarten students and showed that exactly when children achieved threshold levels of GPC knowledge and PA, they showed representational change in word knowledge, for the first time representing boundary consonants in word reading errors (e.g. B**N errors such as 'bone' or 'barn' for the word 'bean'). Longitudinal research shows that students with stronger PA likely subsequently 'fill in' the full form of the words via direct instruction or (intensive) directed exposure to the relevant vowel digraph GPCs in grade 1. Similar patterns are directly indicated in student's spelling.

Perhaps because as students learn to read beyond these initial phases in K and grade 1, they may stop overtly phonically 'sounding out words' out loud, there is a temptation to think that GPC-based phonic decoding is then 'bypassed' by quite different fast direct pathways to word storage and access. Certainly, larger units such as rimes, word meanings (morphemes) and connections with whole neighborhoods of similar words are firmly established in the middle years of elementary school and beyond to aid fast and

fluent word reading. It is, however, much more likely that these early-established GPC 'pathways' to remembering words become automatic rather than being replaced by a whole new pathway. Evidence for this comes from reliable 'regularity' effects showing that regular words are, as a group, read faster than irregular words. This shows that GPCs continue to shape word recognition reaction time and accuracy throughout the middle years of childhood and, indeed, in adulthood. We should note this effect is moderated by raw word frequency – how many times that specific word appears in print affects reading.

Finally, there is lots of evidence from very carefully - executed research that literate adults show phonologically based influence on their performance in certain reading tasks. For example, proofreaders miss phonologically identical words such as 'rows' in a passage about flowers where they expect read 'rose'. Brysbaert (2022) list half a dozen other phenomena in adult readers such as slower reading of tongue-twisters that show the impact of phonology. Brysbaert also interprets an established neuroscientific model of 'ventral' and 'dorsal' brain pathways known to underpin reading. Brysbaert shows that these brain pathways reflect the intimate role of phonology in mature word reading.

In sum, PA and GPCs drive reading throughout reading development up to and including expert adult reading. This is because GPCs allow precise and fast access to specific word pronunciations. This 'systems-based' need for accurate speed access to individual words in reading fluently only becomes more demanding with the ever-expanding file cupboard of word-specific memory files (i.e. words) we accumulate from pre-literacy to adulthood!

Let's now look in detail at the processes of using GPCs in English.

A. Where do GPCs fit in for reading regular words?

I have illustrated below how children use GPCs to read [ON SCREEN: Figure 1 diagram appears on screen representing the following process of how children use GPCs to read]. Here encountering a printed word for the first time is a **learning opportunity** for a student *with sufficient foundational GPC knowledge and phoneme awareness*.

On meeting the word 'sheep' for example, a student with foundational skills can:

- 1) identify the relevant graphemes

(sh – ee - p)

- 2) translate each grapheme to its corresponding phonemes:

grapheme to phoneme (in IPA format)

sh to /sh/

ee to /ee/

p to /p/

- 3) blend these phonemes to produce the spoken word /sheep/
- 4) Identify the word pronunciation and a stored word meaning 'farm animal covered in wool'

You may have realised that this phonic decoding approach can work for *all regular words* if children have these foundational skills. Once phonic decoding is taught (that is, ONCE ABSOLUTELY MASTERED), no teacher or other adult is (in principle) then needed, instead meaningful access to a range of quality texts provides the exposure needed for students to apply these alphabetic skills and build a wide reading vocabulary. Phonic decoding becomes a *self-teaching* mechanism for students. Hence its power I have hinted at from video 1, and time we have spent on it, and the key component GPC and PA abilities.

However, there is even better news here. David Share and colleagues have shown that once children engage in such *self-teaching*, they learn not just to sound out GPCs but to link GPCs to a very particular spelling pattern. In their influential experiment, to avoid confounds of some children knowing the words to be learned at the start, Share used made-up 'pseudowords' never before seen by the students. Students first sounded out unfamiliar words in a short story about a fictional place called 'YAIT', the students were later able to distinguish this form 'YAIT' from other candidate items with identical pronunciations (e.g. 'YATE') [ON SCREEN: Yait appears on the left side of the screen with spelling y-a-i-t. The candidate item Yate appears on the right side of screen with spelling y-a-t-e] and performed in a similar way with other pseudowords in other texts. GPCs underpinned word-specific knowledge of orthographic (spelling) patterns. This self-teaching process can and is used in authentic word reading.

Thus, we can add a further section to the Figure 1 diagram 'access word pronunciation' (link phonemes and word pronunciation to an orthographic (specific letter form of word 'sheep') and its meaning) [ON SCREEN: 'access word pronunciation' section added to the Figure 1 diagram on how children use GPCs to read on page 5]. These overlapping elements of word-knowledge will then become further fused through repeated subsequent exposure to the printed word.

This self-teaching facility is why capable readers and spellers who have early established PA and elaborated GPC knowledge (and quite probably, with some other key skills we will consider) sometimes seem to ‘take off’ in almost magical ways in word reading and spelling to the amazement and delight of teachers and parents. It is not magic of course but a happy demonstration of the computational power of GPCs in alphabetic systems – the alphabetic principle. There are some important caveats to the idea that students can entirely self-teach such as a very full knowledge of PA and GPCs, and as we shall see below, there is more to reading in English than regular words, nevertheless it is a highly significant developmental step we want to get all students to, and early in their reading careers for reasons I will further illustrate below.

By contrast to the rosy picture above, now picture the struggling reader in, say, grade 1 who has weakly developed phoneme awareness and weak knowledge of GPCs. Such ‘at-risk’ weaker readers are those who cannot reliably identify GPCs. They are forced to rather wildly guess pronunciations that are often entirely unrelated to the print in front of them or they use just the first letters of words (not even the first grapheme, e.g. seeing ‘sheep’ => /said/. Worse still they have paired the print exposure to ‘sheep’ to the wrong pronunciation – which will only confuse them further! We know from video 1 they have ‘messy’ GPC links due to low PA and now have messy confused GPC -printed word associations as well!

For the capable decoder every print exposure is a learning opportunity so they quickly race ahead of weaker readers who cannot profit from print exposure. Hence my strong emphasis on the crucial word building foundations of phoneme awareness (that as we learned in video 1 underpin GPC learning), and on a strong basis of GPC learning as described in the Ontario language curriculum that includes not just single letters such ‘s’ and ‘e’ but common digraphs such as ‘sh’ and ‘ee’.

B. Where do GPCs fit in for *spelling* regular words?

I have illustrated below how children use GPCs to spell in Figure 3. Here, being required to spell a word is again a **learning opportunity** for a student *with sufficient GPC knowledge and phoneme awareness*.

On meeting the spoken word ‘sheep’ for example, a student with sufficient language skills will orally access ‘farm animal covered in wool’ at the start, and with foundational reading skills will:

- 1) Segment the spoken word to identify the relevant phonemes

(/sh/ – /ee/ – /p/)

- 2) translate each phoneme to its corresponding written graphemes:

Phoneme to grapheme

/sh/ to sh

/ee/ to ee

/p/ to p

- 3) Write or type graphemes to produce the printed word 'sheep'
- 4) Access the printed word representation if available and link print and pronunciation to the word meaning.
- 5) Verify the spelling and reading representation are identical. For regular words they generally will, unless there are equally frequent variants of PGCs such as 'ea' for 'ee'. In such cases the incorrect choice for spelling '(e.g. sheap') may be noticed as incorrect once written using reading-based print knowledge.

C. Where then do GPCs fit in for the reading of exception words?

Exception words do not perfectly follow cardinal GPC rules. On one view this suggests a separate 'pathway' is needed for them. For some teachers traditionally this has meant the teaching of 'sight words' through flash cards and word walls and rote learning. However, evidence shows that cases of separate difficulties for regular and irregular word reading do occur but reading of these two sorts of words is generally highly correlated across whole classrooms of students (i.e., most struggling readers struggle with both word forms). There may be a role for some sight vocabulary instruction alongside robust phonics instruction for fully decodable words, but....

- I) It is unlikely that many GPCs that are shared and accurate even in exception words, e.g., the 'y' and the 't' in irregular word 'yacht' are not used at all to help derive a word pronunciation for 'yacht'.
- II) Sight word learning is inefficient and labour intensive and perhaps not much fun for teacher or student if done for excessive numbers of words
- III) Sight word learning is clearly impossible to do for all exception words a child will ever meet.

Evidence however suggests that the learning of ‘exception’ words is associated with phonic decoding but also with semantics (word meanings). Evidence suggests students likely use semantic resources of word meanings with GPCs to help flexibly navigate these irregularities using a process called *set-for-variability*. We illustrate below.

Here encountering a printed word is a more complex learning opportunity even for a student *with sufficient GPC knowledge and phoneme awareness*.

On meeting the word ‘stomach’ for example, a student will try to:

- i) identify the relevant graphemes:

(s - t - o - m - a - ch)

- ii) translate each grapheme to its corresponding (*expected*) phonemes:

grapheme to expected phoneme	correct phoneme (added where different)
s to /s/	
t to /t/	
o to /o/ (as in ‘hot’)	/u/ (as in ‘hut’)
m to /m/	
a to /a/ (as in ‘and’)	/e/ (as in ‘under’)
ch to /ch/ (as in chat)	/k/ (as in ‘cat’)

- iii) blend these phonemes to produce the word. This however does **not** produce /stomach/ but (something like) “stoh-match” because applying the most common GPC rule leads to the incorrect phoneme in 3 cases above for ‘stomach’.
- iv) This will *not* (in itself) trigger identification of the word pronunciation and an appropriate stored word meaning ‘place where your body digests food’
- v) **Some evidence suggests an additional step is needed in such cases:** The ‘stow-match’ pronunciation approximates somewhat to ‘stomach’ (50% of the GPCs (‘s’, ‘t’, ‘m’) are accurate *and* appear in the correct serial position left to right within the word). Thus, with a) some checking (e.g. encouraging students to ask: ‘is stow-mach a word? – answer, ‘no’), and b) some *flexibility*, especially in pronouncing the vowels of English that vary the most, and c) as long as the student is familiar with the oral vocabulary for ‘stomach’ already, many children can or

can be taught to adjust their pronunciations a little to link their correct (but in this case, inaccurate) phonic decoding to the conventional pronunciation of the word.

This idea of ‘flexing’ vowels in the curriculum in grade 2 and 3 as a ‘consolidated strategy’ in the Table: grades 2–3: b2.1 [ON SCREEN: table: grades 2-3: b2.1 appears on screen. It can be accessed through the [Ontario Curriculum and Resources website](#)] I have illustrated it below:

While the curriculum focuses on grades 2 and 3, there is at least some evidence this flexing can be done in grade 1. An exploratory approach in grade 1 classrooms is thus wise. It can also be undertaken for some variable consonants (e.g. ‘g’ in goat and giraffe), and as here with the ‘ch’ in ‘stomach’.

Note: we will consider the idea of syllable stress and polysyllables more closely in video 6 on reading fluency.

D. Where then do PGCs fit in for the spelling of irregular words?

On meeting the spoken word ‘stomach’ for example, a student with sufficient language skills will orally access ‘place where your body digests food’ at the start, and with foundational reading skills will try to:

- i) identify the relevant phonemes:

(/s/ -/ /t - /o/- /m/-/ a/- /ch/)

- ii) translate each phoneme to its corresponding expected graphemes:

phoneme to grapheme

/s/ to s

/t/ to t

/ʌ/ to u

/m/ to m

/ə/ to a (or possibly ‘u’ or ‘er’)

/k/ to k (or possibly ‘c’)

- iii) write or type these graphemes to produce the word. This however does **not** produce 'stomach' but (something like) 'stumak' or 'stumerk' or 'stumerc' [ON SCREEN: Three different spellings of the word 'stomach' appear on screen as follows: 's-t-u-m-a-k', 's-t-u-m-e-r-k', and 's-t-u-m-e-r-c'].
- iv) Despite being inaccurate, this phonetic spelling **may by phonology alone** still allow the student to identify an existing word pronunciation and connect it to an appropriate stored word meaning 'place where your body digests food'
- v) **Some evidence suggests an additional step is needed for irregular word spelling:** This is slightly different to the step of using *set-for-variability* in reading irregular words. It involves checking the spelling against existing spelling knowledge derived from word reading. As adults we are familiar with the experience of spelling a word and noting it doesn't 'look right' and then changing (hopefully correcting!) it. *If* children have stored an accurate spelling of the exception word 'stomach' derived from reading (and correcting) the exception word stomach as we might hope from the self-teaching hypothesis earlier, there may be two word forms available and a mismatch between the two forms (one derived from reading and one from spelling) that children can be taught to notice as a form of self-monitoring. Teachers can also support the spelling of such words directly. These are other strong reasons to regularly teach reading and spelling *together*.

3. Does reading and spelling develop on its own, or do I have to teach it?

Early word reading build directly on the combined effects of GPC and phoneme awareness. We have already learned in video 1 (phoneme awareness) and video 2 (letter names and GPCs) about the need for direct teaching of each of these component abilities, in quite specific ways. In a sense then we already have an answer to our question about the need for direct teaching. We have also noted that this is linked to equitable starts for all students.

Additional studies we have described above have also shown that the explicit and intentional and systematic teaching of word reading sub-skills such as phonics, and strategy, and word meaning to read regular and irregular words. There is now much direct evidence from INTERVENTION studies (carefully controlled studies of the effects of teaching one way in some classrooms versus a different way in others). This research shows quite reliably that specific approaches here such as synthetic phonics delivered

through direct instruction are maximally effective. We will also consider where, first from a firm basis in such instruction, guided exposure to the print system of English is also warranted. Both aspects involve the teacher as a direct active agent of student learning. This work is considered in the next section.

4. Practicalities – How do I teach reading and spelling using the science of reading?

Reading builds on foundational PA and the component GPCs, spelling similarly uses foundational PA and PGCs. Foundational teaching of these considered in videos 1 and 2 is not repeated but assumed here. With this in place, two key activities are evidenced:

1. *Phonic blending through synthetic phonics.* Synthetic phonics involves the blending of the individual GPCs in a word to produce a word pronunciation, as we worked through for the word ‘sheep’ above in Figure 1. This point about use of GPCs also links back to a point made in video 1 where we found that phoneme awareness as measured by phoneme blending in grade predicted reading as far in advance as grade 6. Equally phoneme segmentation as shown in figure 3 aids spelling.
2. *Word building.* This approach involves word changing activities. For example, turning the word ‘sat’ into ‘sap’ and then to ‘tap’ and then ‘top’ and ‘stop’ etc, using appropriate artefacts to model this. This sort of activity nicely complements the specificity of phonic blending in individual words, by showing the shared foundations across words of GPCs, and is analogous to activities that cement phoneme awareness discussed earlier in video 1.

Research shows both sorts of phonic activities need to be ‘intentional’ (planned) and programmatic and systematically delivered over time to be effective. The scope of GPCs should be based on the Ontario language curriculum coverage of GPCs and associated PA we have already met and regularly tied to reading of books. Very much like for PA work we met in video 1, a range of syllable structures from simple CV VC through CVC to more complex cluster blends and segmentations of CCVCC and CCVCC syllables need to be explored. Decoding (blending) and encoding (segmentation) like many learned abilities progresses from ‘acquisition’ through ‘maintenance’ ‘mastery’ and ‘generalisation’ (self-teaching) stages and should be supported as such over grades. As students encounter novel irregular words they can be helped through instruction to ‘flex’ pronunciations. These ideas are all well-represented in the Strand B guidance below [ON SCREEN: the table Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological

Knowledge appears. It can be accessed through the [Ontario Curriculum and Resources website](#)].

It is important to note that ‘one size does not fit’ for all student as they vary in experience and knowledge of phonology GPCs and decoding. Nearly all students will need sustained but highly differentiated support on all in the earlier grades. Some students, who we are certain, really can decode to read and encode to spell with genuine mastery likely benefit from wide reading experience to ‘self-teach’ word reading and using reading to learn wider curriculum content at this point. Research also tells us clearly of the important role of rich wider oral language programmes and especially morphology and vocabulary here to support phonics as well as the key role of regular linkage of phonics to book and other text reading experiences for all phonics learners. We have already considered how intimate reading -spelling links help literacy development.

An important point to consider note is that while – the move towards self-teaching is central to reading and spelling, there should not be *an exclusive focus on context-independent phonic rules in instruction*. Another important feature of English print is that there is some consistency in the GPCs in their relative position within words. There are discernible GPC patterns at the beginning middle and end of syllables that mean that there is an important ‘lexical’ (word) effect on GPCs. These restrictions a language applies to the positions and patterns of graphemes in written words is called an ‘orthotactic constraint’ of the spelling system (orthography). There is of course an analogous (‘phonotactic’) constraint that operates on phonemes. For example, ‘ng’ occurs at ends of words not beginnings (e.g. ‘thing’ ‘sung’ ‘hang’ etc), as does ‘ll’ (‘ball’, ‘well’, ‘spill’, etc).

These ideas are all fully represented in expectations in the Strand B table “Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge” [ON SCREEN: the table Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge appears. It can be accessed through the [Ontario Curriculum and Resources website](#)].

The curriculum also notes: Instruction in grapheme-phoneme correspondence should focus on teaching students the “most common spelling” grapheme for that phoneme in that position to support students in making the correct choices when reading and spelling. And that ‘orthographic knowledge cannot be taught in isolation and needs to be practised and applied in word decoding and spelling.’

Finally, while there is a need for direct instruction in context-independent GPC rules, an exclusive focus on direct instruction without authentic print exposure does not give a student the mixture of experiences needed to also acquire more context-dependent 'statistical' patterns of print-sound patterns that occur in English. This latter experience of wide print exposure does firmly presume basic decoding skills though, I caution.

5. Practicalities - When do I teach word reading and spelling?

Effective generalizable reading teaching builds on PA and the presence of at least some GPCs first being established. We have learned there is little value in early environmental print exposure alone. It is helpful though perhaps not essential to have an established base of English oral vocabulary to aid reading and spelling.

Name writing is also an important early skill. Writing may prime phoneme awareness which stimulates reading using phonics. Reading using phonics may aid spelling accuracy checks, so there is an intimate relationship over time between very early reading and spelling.

It is very important that there is a sufficiently intensive high quality and effective exposure to synthetic phonics that most (and ideally all) students can eventually use self-teaching principles to independently decode and encode single syllable words with a range of simple CVC to complex CCVCC structures by the end of grade 1. Foundations in kindergarten build to this success. We have also learned that English is a sufficiently complex spelling system as to need sustained attention to word reading and spelling process through grades 2 and 3 (and potentially beyond), consolidating, automating and generalising abilities.

The revised Ontario curriculum provides appropriate curricular targets and expectations by grade to guide detailed school-wide planning of teaching.

6. Practicalities - To whom and how much do I teach?

As we have already noted, many students arrive in Grade 1 with strong phoneme awareness and GPC knowledge. Others arrive with few or none. Some may have started to read in other languages which can be a resource of knowledge to be harnessed. The need to assess and differentiate and intervene to teach intensively as needed is key. Reading, via phonic decoding and spelling encoding, built on these firm foundations can then start

fairly immediately. All children benefit, but some will need more, so teach, assess, and differentiate as needed. Most jurisdictions around the world that have implemented evidence-based practice have found that a substantial daily focus is needed to improve reading and spelling. The Ontario Curriculum, Grades 1–8: Language, 2023 describes the requirement to protect time for foundational language instruction. This includes uninterrupted time for explicit and systematic instruction in foundational reading for a minimum of 150 minutes per five-day cycle. This protected time for foundational reading instruction should be realized through daily blocks of at least 30 minutes within the overall daily literacy block.

There is some research evidence suggesting optimality for distributed learning of phonics across the school day over one single massed daily session. Researchers found that several short 8-10 minutes sessions of targeted phoneme awareness GPC practice, phonic blending and segmenting sessions at start of day before and after lunch and at the end of day were powerful levers for improvement, with careful ‘interleafing’ of old and new material over time also helping.

7. How do I assess my teaching has been successful?

As in previous sessions, assessment-teach-assess loops of practice are effective practice but ensure students are starting to *use* taught phonic abilities – this is seen in spelling and attempts to sound new words independently.

Assess against the detailed curriculum expectations *in Strand B*. Use the evidenced description of practice above in the curriculum to then assess against the curriculum-based instruction.

If students are not progressing, consider need changes. Diagnose the *teaching*. For example, evaluate the quality of the reading and spelling instruction you are using.

Does the program:

1. Embody intentional systematic synthetic phonics (blending and word building)?
2. Base phonics teaching on first establishing PA and GPCs?
3. Have a progression that covers all GPCs and syllable shapes?
4. Link phonics to text reading opportunities?
5. Link writing and spelling to reading?
6. Offer a clear strategy for dealing with irregular words in reading and spelling?

7. Link to wider communicative intent and purpose for comprehension and (ideally) alongside strategies for comprehension
8. Provide motivation - engaging texts choice, clear record of success over time?
9. Culturally appropriate content (in all senses)?
10. Have independent evidence of its effectiveness?

If 'no' you may have your answer to why students are not learning as you hoped – you may need to modify or supplement your existing approach.

8. How do I use this teaching to prevent difficulties?

As we have found before, documenting and monitoring of the program and its quality delivery over time is a key step to making sense of reading progress students make. In some cases of slow progress consider increasing the intensity of support given, and even, if possible, consider sensitively delivered intensive tutoring or small group support for those making least progress.

9. How does teaching of word reading fit with my teaching of reading for meaning?

We have noted that word reading draws on both phonological awareness and morphology. We will learn more of the latter contribution in the next video. Here we note that phonic approaches can and should be delivered within a wider curriculum focus on quality language development. It is both not one or the other that will build strong reading comprehension.

10. How does teaching reading fit to my wider curriculum delivery?

Literacy underpins much of the wider curriculum of course, and as such provides opportunities to practice specific skills taught during literacy / language arts time (e.g. encoding spelling, phonics, etc) in a range of other content areas.

For some, first hearing about SoR may bring up notions of a return to an early time of more simple classroom instruction-, but let's be very clear: there is no aspect of SoR evidence that says we should return to models of instruction where students sat silently in rows or that ONLY phonics should be taught, or that ONLY direct instruction is evidenced. There is no element of SoR that speaks to required weekly spelling tests, or heavy use of worksheets, or drill and rote learning, or endless homework. There is no evidence that decodable basal readers are essential or that commercial reading schemes are required to raise standard over other evidence-based content. Often the evidence points in quite the

other way on many of these ideas. SoR is very much a forward-looking approach that, as the name suggests, follows the science.

In concluding, the SoR is demonstrably effective and as such provides guidance. It does not relieve us of the burden of thinking and using what we know on the wider learning sciences of effective teaching and learning more generally. The most effective delivery of SoR approaches will of course be deeply humane.

Some research-led suggestions on what will and will not be effective

Not effective

Effective

Teaching word reading by sight or by rote	There may be a role for some sight word teaching, but for regular words, phonics is evidenced as more powerful and even for irregular words there are alternative approaches to consider.
Treat all words as equivalently difficult to read	<p>Use the known hierarchy of within syllable difficulty CV, VC-> CVC -> CCVC -> CVCC -> CCVCC, as a basis for planning of teaching synthetic phonics.</p> <p>Use assessment and task difficulty to build a progression of phonics tasks and learning opportunities relevant to the needs and variation you see in your class through assessing phonological abilities through language tasks and other sources</p>
Teach phonics in isolation from text reading and without an explanation of why it is being taught.	<p>Make sure to link phonics instruction to text reading opportunities. Some research suggests same-day opportunities to are important.</p> <p>Incorporate spelling and handwriting often.</p> <p>Always explain how and why phonics works to students. Ask them to explain back to you how and how well it works.</p>

<p>Assume one size fits all in teaching</p>	<p>Assess through your teaching what students can do and teach at instructional level (at least 80% success)</p> <p>Differentiate e.g. some children need more focus on phonemes others on GPCs others on reading and spelling at an ‘instructional’ level in any given inclusive lesson.</p>
<p>Insist students struggling with phonics and /or with known articulation difficulties to read in ‘public’ spaces.</p>	<p>Consider the assessment needs of students with speech and language difficulties carefully and consider non-verbal responses where appropriate</p>
<p>Assume one articulation or ‘accent’ of words is better than another - children’s backgrounds and other languages may impact reading aloud.</p>	<p>Consider diversity and inclusion needs here very carefully.</p>
<p>Teach phonics in an incidental or an ‘as needed’ way or on an occasional basis or in any other ways without detailed attention to the alphabetic principles of decoding and encoding GPCs.</p> <p>Encourage scanning of page or guessing</p>	<p>Evidence shows firmly that a systematic intentional planned sequential synthetic phonics program delivered and reinforced regularly, with coverage of the many GPCs and syllable structures of English is effective in teaching students in early elementary classes to read English.</p>
<p>Don’t assess reading</p>	<p>Use assessment systems that inform instruction including regular assessment against the Ontario curriculum content guidance and the Strand B particulars.</p>
<p>Teach without consulting colleagues</p>	<p>Think of school-wide structures here especially others who might help Close kindergarten – grade 1 links in particular are suggested. Consider a whole school approach - ask consultants speech and language and educational psychology specialists for example) Are there cross-school learning opportunities?</p>
<p>Teach reading and spelling as desk-based skill and drill with worksheets</p>	<p>Learning to read and spell is again a form of problem solving. Direct instruction is key but modelling of processes and</p>

	<p>opportunities to practice in texts and for the purpose of communication are needed. Aspire to creating self-teachers of your students!</p> <p>Motivation and success go together.</p>
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Finally, I have been emphasizing for GPCs and for phonemes in videos 1 and 2, that the ‘technical complexity’ is a small price to pay for the otherwise super-efficient alphabet system where children learn 1000s of new words for themselves – **the alphabetic principle**). Now we have considered these processes in action in video 3 in relation to reading acquisition and teaching. You should now fully understand their power to support strong foundations of word reading.

Summary and conclusion

We have considered

We have learned

1. What is the Science of Reading?	The SoR refers to our understanding of how reading and spelling develops and operates, based on the accumulated evidence from research scientists working across a range of disciplines around the world over many decades
2. What does the SoR tell us about the teaching of reading and spelling that I should I know about as a teacher?	The SoR provides evidence on how children learn to read and spell, and the sorts of classrooms, curricula, policies, and teaching approaches that are most effective in teaching reading and spelling.
3. Does reading and spelling develop on its own, or do I have to teach it?	Evidence shows that the direct and intentional and systematic teaching of word reading sub-skills such as phonics, and strategy, and word meaning to read regular and irregular words. Subsequent guided exposure to the print system of English is also warranted.
4. Practicalities – How do I teach reading and spelling using the science of reading?	Synthetic phonics delivered through direct instruction is maximally effective. Children then need to be shown strategies for

	exception words and some of the word position-specific characteristics of English spelling.
5. Practicalities - When do I teach different aspects of reading and spelling?	On the firm base of PA and GPCs. Sufficiently intensive of synthetic phonics to allow decoding and encoding of single syllable words with a range of simple CVC to complex CCVCC structures by the end of grade 1. English is a complex spelling system It need sustained attention through grades 2 and 3 (and beyond!), consolidating, automating and generalising abilities.
6. Practicalities - To whom and how much do I teach?	Probably daily to all at first but with strong differentiation as evidenced.
7. How do I assess <u>if</u> my teaching has been successful?	Assessment is key: Assess student learning but also assess your program.
8. How do I use this teaching to prevent difficulties?	Documenting and monitoring is key again.
9. How does teaching of reading and spelling fit with my teaching of reading for meaning?	Decoding is in some sense foundational but so is a strong language basis. Teach both thoroughly from the start, and not either /or.
10. How does teaching reading and spelling fit to my wider curriculum?	Literacy is a foundational enabler of wider curriculum access. The wider curriculum provides rich opportunity to practice and extend learning first met in language arts.

You should now have all you need to plan and deliver a strong and highly impactful reading teaching experience for diverse learners.

Reflection points

How can I use this information and what I know about phoneme awareness and GPCs together to shape my literacy teaching practice?

How can we as a whole school (or early years group) work together on a really robust approach to early literacy development?

How might we develop a community of practice here to develop together?