Video 4: Word Reading and Spelling Part 2 - Morphology

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A very warm welcome again, colleagues, to this fourth of this series of seven professional development videos focused on strand B of the revised Ontario Language Curriculum 2023. This video is the second of two that focuses specifically on reading and spelling, this one focusing on the role of morphology. It should be understood in close relation to the preceding videos 1 and 2 and in very close relation to video 3 that considered the role of phonology in reading and spelling. This video takes about 45-50 minutes to complete the content. As now familiar there are then reflection points for you to consider after that. Again, 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 about teaching with morphology:

1. **What are morphemes?**

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

3. **Does the use of morphemes in reading and spelling develop on its own, or do I have to teach it?**

4. **Practicalities – How do I teach reading and spelling with morphology using evidence-based systematic and explicit instruction?**

5. **Practicalities - When do I teach different aspects of morphology in reading and spelling?**

6. **Practicalities - To whom and how much morphology 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 morphology that can impact many young people who otherwise struggle to reach word reading and spelling accuracy and fluency.

1. What are morphemes?

What are morphemes? – morphemes are the smallest units of *meaning* in a language and consisting of *bases* (sometimes called '*roots*' or 's*tems*') such as the word 'luck', and *affixes* (broadly things that are fixed to bases such as *prefixes* (e.g. un-) and *suffixes* (e.g. 'y') in 'unlucky'). Some bases can occur as word alone (e.g. 'I have had some good *luck'*), whereas affixes do not alone convey meaning as stand-alone words ('*un*' and '*y*' are not permitted words). Bases that can occur alone (e.g. 'free' in 'freedom') are referred to as 'unbound bases', whereas bases that cannot occur alone (e.g. 'struct - 'in 'structure') are called 'bound bases'. Many words are constituted from only unbound bases e.g. 'necklace' 'postman'. Such words are referred to as 'compound morphemes'.

There also exists an important distinction between *inflectional* morphology and *derivational* morphology. In i*nflectional* morphology the grammatical class of a word is unchanged across forms and refers largely to the limited number of changes of tense signalled by bound morphemes in English verbs (e.g. 'helps', 'helped', 'helping'), and the role of adverb comparatives and adjective superlatives (i.e. '-er' and 'est', as in 'faster' and 'fastest'). English is relatively straightforward at the inflectional level (it does not for example signal 'person' like gender in French does). A lack of sensitivity to grammatical patterns in inflectional morphology may be one important marker of risk for language delay in young student's spoken language in grade 1 in speakers of English and French. This kind of observation may indicate the need of explicit, direct instruction for certain young students. In derivational morphology the grammatical class of a word *does* change (e.g. the adjective 'quick' becomes the adverb 'quickly'). Derivational morphology is more fulsome in English allowing many forms of related words to be represented (e.g., 'happy' in 'unhappy', 'happiness', 'happiest', 'happily' etc).

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

We learned in video 2 that the evidence-based research 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. The evidence-based research has informed the development of the revised Ontario language curriculum, 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.

We have also learned in video 3 that spelling systems represent the spoken language (albeit in a very specific way) and that written (and spoken) languages also convey meaning. We learned that the evidence-based research 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 thus considered the role of phonology (speech sounds) and part 2 now considers morphology – word meanings). The two videos and content are complementary, as reading and spelling likely involves both morphological and phonological capacities.

Let's look at the case for teaching morphology to children. I will divide it into two parts – theory and evidence.

Theory of morphology

In video 2 we met the idea that a limited number of phonemes underpin all words. Thus, subtle phoneme contrasts underpin the use of the alphabetic principle. A single phonemic change between the words: 'dog' 'bog' and 'dig' for example produces big differences in their word meaning. Students and teachers should thus focus on phonemic awareness and GPCs. By contrast, when it comes to morphemes, bases repeat across words (e.g., 'happy' in 'unhappy', 'happiness', 'happiest', 'happily', etc.) and are hard to miss acoustically and in print. Furthermore, the affixes (here: 'un-', '-ness', '-est', '–ily') are also consistent. Many (but not all) affixes operate in somewhat predictable ways that are highly visible and highly informative about words. For example, the suffix '-ous' very often indicates an adjective (e.g. as in 'envious' or 'devious').

Concepts represented by compound morphemes shape the very lives of young people (consider e.g. 'breakfast', 'blackboard', 'lunchtime' 'playtime, 'homework', 'fairytale', 'bedtime'), and analyses show compound morphemes occur very often in young students spoken and real book printed worlds. Indeed, all polymorphemic words (words with more

than one morpheme) occur often even in the quality 'real book' literature of even very young students.

Given what we learned of the inconsistency of English spelling in video 2, it should not be a surprise to learn the system does not play out perfectly in written English. There are lots of letter patterns in English that look plausible as morphemic 'relatives' but are not related. There is no morphemic relationship between 'turn' and 'turnip', 'moth' and 'mother' or 'broth' and 'brother' for example. Indeed, relationships are so opaque one often needs to consult an etymological dictionary (a dictionary of the historical origin of words) to identify false and true relatives. Consistencies of meaning even where evident are partial, not complete: A snowman is made of snow, but a postman is not made of post, for example.

Nevertheless, English often sacrifices print-to-sound consistency to preserve print meaning consistency in many cases (e.g., we have 'sign' and 'signal' where the silent 'g' in 'sign' shows its family relationship to 'signal' (and 'design' and 'designate' and 'signature'), instead of being represented phonologically (e.g. as 'sine') which while 'regular' phonically would not preserve the relationship with morphemic family words such as 'signal' and 'signature') through shared spelling. This suggests that teaching students about print-meaning consistency is helpful.

It is possible for students who have weak phoneme awareness and phonic decoding abilities despite intensive support over time, that morphology might provide, to some degree at least, a 'compensatory route' (i.e., another way in) to reading and spelling.

Finally, morphology may be a way reducing the burden of learning vocabulary for students. If we think not of individual words, but of morphologically related families of words, there are just over 11,000 bases (which it has been estimated, represents a learning rate of about 2 per day across the school years). This is modest when compared to over 70,000 individual words if they are treated as isolated items (and which adds up to about 12 words a day from age 4 to learn – a challenging task indeed!).

These are all good *logical* arguments for the likely importance of morphology in reading and spelling acquisition and teaching in English. However, quality evidence will determine if these arguments actually hold up in the real world of learning to read and spell.

Evidence on morphology use

We know from video 3 that the evidence-based research includes multiple studies around the English-speaking world about how children learn to read best that help us answers important practical questions about 'what works' in reading and spelling teaching. What does this evidence say about morphology?

First, we know with some confidence that skilled adult word reading and spelling is impacted by morphology. Having seen the word 'dark' adults are faster to read 'darkness', for example. Adults are also highly sensitive to even those false 'pseudo'-morphemes (e.g., 'corn'-'corner') in reading reaction time tasks. The questions we thus need to ask are - when do school age students start using morphemes? And when do they achieve adult-like performance?

Turning to the first question, even before school age, pre-kindergarten students are exposed to lots of morphological patterns in spoken language, and early morphological abilities are a good predictor of later literacy outcomes. We also have some evidence that teaching oral morphology to pre-school students impacts later language comprehension, though the clearest evidence comes from a study in a non-English spelling system in Norway. This finding might nevertheless be good information to share with your pre-school providers. We have also mentioned the developmental importance of inflectional morphology in early language (grade 1) as a possible index of later language difficulties.

Students by middle elementary years show some sensitivity to morphemes, evidenced in in reading accuracy tasks, but do not show the same speed and widespread sensitivity to even the semblance of morphological units that adults do (e.g., 'corn'-'corner') until as late as high school. Even in high school, there is variation among students in morpheme sensitivity tied to literacy skills (that is, better readers show better morpheme awareness), so this suggests morphological abilities develop from early-middle elementary all the way through high school. In sum, there is evidence that it is not until adolescence that students start to show adult-like fluency in the use of morphemes.

We will consider later how we might best teach morphology to help this learning process. I will note for now that there is at least some evidence from well-executed that suggest teaching morphology as part of the word reading and spelling focus is effective, and hence its inclusion in the Ontario language curriculum guidance in Strand B.

Let's now look in detail at the likely processes in using morphemes in reading English.

A. Where do morphemes fit in for reading words?

I have illustrated below how children may use morphemes to read words. Here encountering a printed word for the first time is potentially a **learning opportunity** for a student with sufficient foundational morphemic knowledge.

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

1) decompose (that is, segment) the printed word to identify the relevant morphemes (un – self - ish)

2) translate each printed morpheme into its corresponding pronunciation: printed morpheme to pronunciation

   un to /un/
   self to /self/
   ish to /ish/

3) blend these morphemes to produce the spoken word /unselfish/

4) Identify the word pronunciation and identify a stored (or deduce a new) word meaning 'to think of others over oneself'

You may have noticed that this morphemic decoding approach can work for *all polymorphemic words* if students have these foundational morphemic skills. Like phonic decoding with GPCs decoding potentially becomes available as a *self-teaching* mechanism for students IF they have the knowledge and can generalise the principle to new words. This is a big IF, given the caution we will note below in some research on the effects of teaching morphological abilities. This is in some marked contrast to the clearer generalisation effects for phonics.

IMPORTANTLY, the model above [ON SCREEN: Figure 1 diagram appears on screen representing the process of how students use GPCs to read using the word "unselfish" as an example] also assumes that students can recognise the constituent morphemes in polymorphemic words (here, 'un-', 'self' and '-ish'). If these morphemic building blocks are unfamiliar to students, and they have no other strategies, the word cannot be read. If students have the foundational phoneme awareness and GPCs, they should be able to sound the component morphemes out using phonic decoding ('u'-'n' -> /un/; 's'-'e'-'l'-'f -> /self'/; 'i' – 'sh' -> /-ish/). Morphemic decoding is thus aided by phonemic decoding.

It is also likely that the reverse patterns also occur – sensitivity to morphemic structure in polymorphemic words may help students break the phonic decoding task into sensible sub-steps (i.e. analyses of the 'un-', 'self-', and '-ish' analyses above related to generalizable morphemes before pronouncing the whole word). Many successful reading interventions do this by teaching students to find 'words in words' [ON SCREEN: table: 'Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge' appears on screen. It can be accessed through the Ontario Curriculum and Resources website]. For these reasons, the curricular advice in Strand B presents both processes together from Grade 1.

What about irregular word reading?

The system above works where the two systems (morphology and phonology) align. What about the mismatches between phonology and morphology in English? If students are using both phonology and morphology, then conflicting answers can be produced. This will happen often for *irregular words* that do not follow cardinal GPC rules. Let's work through an example word 'react'. Morphemes have been termed 'islands of regularity' in English, and the word 'react' is quite readily decodable into its morphemic constituents ('re'+ 'act'). Somewhat atypically for morphology, the morphology here also helpfully guides appropriate word pronunciation. Phonic decoding by contrast likely breaks the word into GPCs 'r'–'ea'-'c'-'t', that when assembled produces something like 'reeked'!

Figure 3: Contrasting word analysis example word – 'react'

	Word	**Analysis**	**Pronunciation**
Morphemic pathway:	react	re + act	/react/
Phonic pathway:	react	'r'–'ea'-'c'-'t'	/reeked/

Some argue that such analyses are good reasons to privilege morphology in teaching written English. This may be true. However, there are other ways for students to solve this problem. You hopefully recall our analyses in video 2 suggesting that additional approaches may be needed to read phonically irregular words that do not follow cardinal GPC rules. We met the idea of encouraging a certain flexibility in adjusting GPC pronunciations (an ability called *set-for-variability*). Here this ability, if deployed alongside *oral* language awareness of *oral* morphology, (e.g., of the spoken word 'act' and of the role of the spoken 're-' prefix more generally), would allow students to adjust with success to read the word. This is done by combining their phonological decoding and oral morphological abilities. Consistent with this view, one recent study found student variation in set-for-variability to be among the strongest predictors of reading accuracy for complex polymorphemic words in middle elementary students. Awareness of morphemes on its own did not strongly uniquely predict complex word reading accuracy in this study.

B. **Where do morphemes fit in for *spelling* words?**

I have illustrated below how children use morphemes to spell words in Figure 4. Here, being required to spell a word is again a **learning opportunity** for a student *with sufficient morphemic knowledge and awareness*.

On meeting the spoken word 'unselfish' for example, [ON SCREEN: figure 4 diagram appears on screen representing the process of how students use morphemes to spell words] a student with sufficient oral language skills will orally access the meaning 'to think of others over oneself' at the start, and with foundational morphological spelling skills will:

1) Segment the spoken word to identify the relevant spoken morphemes:
   s /un/ + /self/ + /ish/

2) translate each oral morpheme to its corresponding written morpheme:
   oral morpheme to printed morpheme
   / un / to un
   /self/ to self
   /ish/ to ish

3) Write or type the morphemes to produce the printed word 'unselfish'

4) Access the printed word representation if available and link print and pronunciation to the word meaning.

As before for reading, it is quite likely that phonics approaches to spelling assist in the decoding of unfamiliar individual morphemes, and that awareness of morphemes helps students to organise their encoding in sensible sub-steps. Morphology will also help where there are multiple ways of representing a word spelling, for example in 'real' versus 'reel' base morpheme spelling in 'reality' or 'sail' versus 'sale' base spelling in 'sailing'.

Where then do morphemes fit in for the spelling of irregular words?

Strong morphemic ability is particularly helpful in the spelling of irregular words. On meeting the spoken word 'react' for example, a student with sufficient language skills will orally access the meaning 'to respond' at the start, and with foundational morphemic spelling skills can process the word effortlessly:

1) Segment the spoken word to identify the relevant spoken morphemes

   (/react/ -> /re/ – /act/)

2) translate each oral morpheme to its corresponding written morpheme:
   oral morpheme to printed morpheme
   / re / to re
   /act/ to act

3) Write or type the morphemes to produce the printed word 'react'

4) Access the printed word representation if available, and link print and pronunciation to the word meaning.

Importantly, for the many words where the morphemic pronunciation does *not* guide the spelling (in irregular words such as 'sign' with its 'silent g'), it is the morphemic knowledge drawn printed consistency *across families of words* ('design' 'signal' 'signature' etc.) that becomes key to successful spelling. *If students know and can access this wider word family information about print-to-meaning consistency, then they will be able to accurately spell even irregular words such as 'sign'.* We can thus predict that morphological skills may be particularly important for spelling irregular words.

As before for phonology, *if* students have stored an accurate spelling of the exception word derived from reading (and correcting) the exception word using the self-teaching hypothesis we met earlier in video 3, children can also be taught to notice and check if a spelling 'looks right' against it. Teachers can also support the spelling of such words directly. These again are other strong reasons to regularly teach reading and spelling *together*.

3. **Does the use of morphemes in reading and spelling develop on its own, or do I have to teach it?**

What evidence is there that direct instruction by educators to teaching morphology aids student reading in elementary schools? An influential meta-analysis (a careful review) of all well-executed studies in this domain (Goodwin & Ahn, 2013) synthesized all the available evidence from morphology interventions (i.e., controlled studies that compared the sustained teaching of morphology to some students with an alternative teaching approach for other comparable students). Across some 30 such studies included, positive overall effects of morphology teaching were found on student decoding, vocabulary and spelling but not on reading fluency or comprehension. Teachers should know however that of the 30 selected studies, only 16 involved 'large groups' of children – that is not necessarily whole classes of students, and just 13 studies involved only average i.e., typical range children. Of these 13 studies, five were delivered by expert researchers not by trained regular teachers, so the results may falsely inflate what is truly possible in busy regular classrooms. If we focus only on the remaining 8 studies that were delivered by regular teachers to regular students, all were delivered to students in grade 3 and beyond, with most being delivered to students in grades 4 and 5. While this evidence does suggest teaching morphology in middle and late elementary classes is effective, we lack clear evidence of the highest quality of the effectiveness of morphology teaching below grade 3.

More concerning, a very recent meta-analytic review by Colenbrander and colleagues (2024, under review) applied an arguably more rigorous approach to selecting the studies for their review including studies exploring only English (because of its distinct opacity) and included only studies with school age students and where reading and spelling outcomes were provided in the original studies. Colenbrander thus provide an updated review that is more relevant to English language morphology teaching of literacy in schools. Colenbrander and colleagues found few effects across some 28 intervention studies teaching morphology. Notably, effects across studies were more evident on directly taught words. This means they did not appear to generalize strongly beyond taught words (e.g., 'react' to analogous untaught words e.g., 'reopen'). There was some evidence that effects were stronger for spelling outcomes and here teaching did generalise more. Colenbrander and colleagues do cautiously conclude that morphology should be taught in schools but that it should be done within the context of multi-component interventions, not teaching morphology alone. Given the absence of clear transfer effects for reading, especially, the choice of which words are taught through direct morphemic reading instruction becomes very important. One caution with this study is that 'peer review' (the expert scientific review that is applied to all science papers for quality control purposes) has not been completed at the time of my writing. This peer review process may lead to somewhat modified findings and conclusions in the 'final' published report in the future.

More broadly, a focus on finding better teaching approaches that generalize from taught words to untaught words across the language remains important. Clearer evidence on effective early classroom delivery of morphological interventions is important because some researchers have argued that an early focus on morphology detracts from crucial teaching time spent on teaching GPCs phoneme awareness and phonics in early elementary classrooms. Teachers should thus consider all these issues above carefully.

4. Practicalities – How do I teach reading and spelling with morphology using the evidence-based approach?

As we have just learned, the school-based intervention research literature is both less advanced and less clear on guidance for morphology compared to what we know about phonology and phonics, as considered in the previous videos. This may change with time as more quality research becomes completed and published.

As it stands however, beyond the evidence on the overall effects of teaching morphology above, we also have less research that gives us a clear picture of the maximally effective teaching approaches. The early reviews above found morphology had bigger effects when taught with phonology over being taught alone. Different programs teach in quite different

ways, and no one approach has been found to produce larger reading or spelling improvements in any review. While most studies have taught common prefixes and suffixes and morphological analysis and synthesis (identifying individual morphemes within polymorphemic words and blending them to make words) only a minority of studies taught students about consistency of spelling across morphemes (and some studies did not work with printed words at all, teaching only oral morphology). Few studies drew students' attention to false morphemes and inconsistency (such as the 'moth' in 'mother ', 'broth' in 'brother' examples we considered at the beginning of the video). We clearly need more evidence on what specific approach or approaches is or are maximally effective.

There is currently little strong evidence from teacher delivery of one approach that currently has high visibility in Ontario - Structured Word Inquiry (SWI). SWI places additional emphasis on etymological enquiry within a morphological intervention. Early published studies were not well-controlled designs, meaning effects might not be due to the impacts of morphology teaching specifically or be repeatable. More recent studies have found modest effects of SWI, and some have reported that teachers found the intervention difficult to implement. Colenbrander and colleagues (2022), randomly assigned grade 3 and 5 students in the UK to receive either SWI instruction or an alternative method focusing on 'robust' vocabulary instruction and reciprocal teaching - a small group-based approach to reading where students collaborate to solve reading problems. Both approaches were delivered by trained regular classroom assistants for a complete school year. Here the SWI approach students learned to use an online etymology dictionary to accurately identify the bases of morphologically complex words. Students were taught to build families related words using 'word matrices' and 'word sums' – technical devices that allow children to compute morphemic relationships. A particular focus was given in instruction on how morphology influences spelling such as where the addition of a suffix to a morphemic base is associated with a 'dropped' single word-final -e, or consonant doubling, or where a word-final -y changes to -i. (Ontario teachers should note that these latter spelling specifics are also in the Strand B guidance "Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge" presented below).

After sustained classroom assistant training over some four days, and subsequent delivery by these school staff, there were however few differences at the end between the groups in terms of literacy or vocabulary skills. Teaching assistants reported it hard to deliver the lessons, and when directly observed, struggled to implement SWI proficiently. To be considered appropriately evidenced, then, SWI needs to show generalizable effects in approaches that teachers (and any classroom teaching assistants) can readily implement. We still await such work. Until then teachers should proceed with some caution. At very

least, teachers should fully understand the tools used in SWI (word sums and matrices) and look out for-, encourage, and then see 'transfer' of principles shown in taught words applied to untaught items.

More generally, however taught, as ever 'one size for all' will not fit students as they vary in experience and knowledge of morphemes on school arrival (as well as of phonology GPCs and decoding). Some students who speak another language competently may be advantaged in their awareness of English morphemes (i.e., their other language(s) are a cultural and cognitive *asset*), perhaps because they have had to think more about how spelling and morphemic systems work more generally. Some morphemes might even be shared or at least similar across certain European languages. There are many opportunities to surface these similarities (and differences) across Canada's two official languages: English and French through teaching. The prefix 're-', and suffix '-tion', for example can operate in somewhat comparable ways across the two (e.g., in the word 'rehabilitation' / rehabilitation to take just one of hundreds of possible examples). =

Nearly all students will need at least some highly differentiated support throughout elementary school grades to use morphology effectively. It *may* be that some students, who we are certain, really can decode to read and encode to spell with genuine mastery using morphology (and phonology) likely benefit from wide reading experience to 'self-teach' word reading and spelling using reading to learn wider curriculum content at this point. We lack evidence on this claim though, as is, regarding morphology specifically.

Research does suggest that morphology and vocabulary may work to support phonics, so these often work together in complex words. We have again considered exactly how intimate reading-spelling links help literacy development.

All these ideas considered here are all represented in expectations in the Strand B table "Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge" [ON SCREEN: table: 'Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge" appears on screen. It can be accessed through the Ontario Curriculum and Resources website].

5. **Practicalities - When do I teach different aspects of morphology in word reading and spelling?**

As we have theorized above, effective generalizable reading and spelling teaching with morphology likely builds on strong oral exposure to morphemes first being established. While we lack clear evidence on effects of systematic class wide morphology teaching in early elementary, an exploratory approach here is appropriate given the strong theoretical

reasons advanced earlier. We also know that a focus on inflectional morphology (especially past tense and plurals) is likely helpful where needed in early elementary instruction. In the early elementary years, students meet many compound morphemes (e.g. words such as 'homework') so a focus here is prudent, building to other common derivational forms after this. Some studies have noted a dramatic increase in the number of complex polymorphemic words in books and other teaching resources around grade 3, so appropriate preparation of students through grade 2 and beyond is prudent.

We have also learned that English is a sufficiently complex spelling system as to need sustained attention to morphological word reading and spelling process through grades 2 and 3 and indeed through and well beyond elementary school, consolidating, automating and generalising abilities. The revised Ontario curriculum [ON SCREEN: table: 'Word-Level Reading and Spelling: Applying Phonics, Orthographic, and Morphological Knowledge' appears on screen. It can be accessed through the Ontario Curriculum and Resources website] provides appropriate curricular targets and expectations by grade to guide detailed school-wide planning of teaching as well as a great deal of detail on exactly which morphemes should be taught.

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

The most recent research review found a 'dosage' effect– the more morphology was taught (i.e., above 20 hours of instructional time), the stronger the effects it had on literacy outcomes. However, the same reviewers recommend caution with this figure as estimates were very imprecise and other evidence has sometimes found diminishing returns from very long literacy interventions. Beyond this, the research evidence does not yet give us more nuanced guidance on the amounts of morphological instruction to give or whether concentrated or more distributed teaching delivery is more effective. In the absence of such clear guidance, teach, assess and differentiate as needed in your class, always observing progress very carefully and looking out for generalisation, while being mindful of pedagogical time efficiency for morphology and phoneme-based elements of word -level teaching. It is likely that general effective approaches such as systematic review with careful 'interleafing' of old and new material over time, and revisiting and mastering previously taught material regularly, aiming for fluency from the start may also help generalization of learning.

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 morphemic abilities – this is seen in spelling

and attempts to sound new complex polymorphemic words independently that preserve morphemic patterns. These can be praised even where attempts are only partly successful to encourage their use.

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 needed changes. Diagnose the *teaching*.

For example, evaluate the quality of the morphological reading and spelling teaching approach you are using.

Does the program:

1. Embody intentional morphology teaching (teaching prefixes and suffixes, blending and word building and segmenting of morphemes in polymorphemic words, morphemic patterns across words and especially print-meaning connections shared across words, even where pronunciation changes)?
2. Build print-based teaching on first establishing oral skills? And alongside strong phonics (and phonemic and GPC) instruction building early towards fluency?
3. Have a progression that covers common derivational patterns in written and spoken English as in the revised Ontario language curriculum?
4. Links word-level morphology work to regular text reading opportunities?
5. Link writing and spelling to reading with morphology?
6. Provides a clear strategy for dealing with irregular words in reading and spelling? and 'pseudo-morphemes' (i.e., those plausible non-morphemes – the 'moth' in mother, the 'un' in 'uncle' etc. that are not related by meaning).
7. Link to wider communicative intent and purpose for comprehension and (ideally) alongside strategies for comprehension, spelling and writing.
8. Provide motivation - engaging text choices, clear records of success over time?
9. Provide culturally appropriate content (in all senses)?
10. Have some 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?

The focus on morphology provides a strong link between word reading and distributed word meanings such as all the words in the 'sign' family we have met above. Strong and rich oral language foundations of morphology built from the early years will really help and show up particularly in morphemic spelling. Inflectional morphology overlaps into work on the teaching of grammatical abilities quite directly as well. As with phonology, morphological approaches can and should be delivered within a wider curriculum focus on quality language development. It is both 'word-level' and 'text-level' teaching and learning not just 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 in a range of other content areas. This is particularly the case for morphemic relatives that appear as keywords across wider arts social studies and science curricula (consider key words such as pollinate photosynthesis gravity, action (and reaction), nationality, identity, artistic, creative, etc. etc.) It is quite possible to identify a morpheme family of the week (e.g. built around the base 'act'), met repeatedly and reinforced across the curriculum.

Finally, I reiterate in closing, a point made it the last video that while the focus on foundational knowledge and skills is attached in the minds of some to a 'back to basics' ideal, there is no aspect of research evidence that says we should return to models of exclusive use of direct instruction, spelling tests, or heavy use of worksheets, or drill and rote learning, or endless homework etc. Evidence-based practice here as elsewhere, 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, around interest and motivation and our students unique experiences. Like all excellent teaching, the most effective delivery of all evidence-based 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 and spelling by sight or by rote	There may be a role for some sight word teaching, but morphology (along with phonics) potentially provides a way of learning wider principles of the spelling system.
Treat all words as equivalently difficult to read	Consider teaching compound morphemes and the most common inflectional patterns early. It then makes sense to teach the most frequent morphemes (e.g. prefixes un- re- dis- and suffixes '-ly, '-y', '-ness') first.

Show how adding a suffix to a morphemic basis associated with a 'dropped' single word-final -e, or consonant doubling, or where a word-final -y changes to -I across many words.

Use assessment and task difficulty to build a progression of polysyllabic tasks and learning opportunities relevant to the needs and variation you see in your class by assessing morphological abilities through teaching. |
| Teach morphemes in isolation from text reading and without an explanation of why it is being taught. | Make sure to link morphology instruction to text reading opportunities. There are good reasons to demonstrate and emphasise print-meaning consistencies even where pronunciation shifts (e.g. 'two-'twin' or 'sign'-'signal').

Incorporate spelling and handwriting often.

Always explain how and why morphology works to students and generally both with and occasionally, distinct from phonics. Ask them to explain back to you how and how well it works. |
| Assume one size fits all in teaching | Assess through your teaching what students can do and teach at instructional level (at least 80% success) |

	Differentiate e.g., some students need more focus on oral morphemes others on print consistency of morphemes, others on reading and spelling and awareness of pseudo-morphemes, all at an 'instructional' level in any given inclusive lesson. Where possible make cross-language connections where your students speak another language or languages.
Insist students struggling with morphology or with known semantic or articulation difficulties read in 'public' spaces.	Consider the assessment needs of students with morphological and speech and language difficulties carefully and consider non-verbal responses where appropriate
Assume one articulation or 'accent' of words is better than another - students' backgrounds and other languages may impact reading aloud.	**Consider diversity and inclusion needs here *very* carefully.**
Teach morphology in an incidental or an 'as needed' way or on an occasional basis or in any other ways without detailed attention to the principles of morphology. Encourage scanning of page or guessing	A systematic intentional planned sequential morphology program focused on printed and oral words delivered and reinforced regularly, with coverage of the many morphemes of English is likely most effective in teaching students in elementary classes to read English.
Don't assess reading	Use assessment systems including regular assessment against the Ontario language curriculum content guidance and the Strand B particulars.
Teach without consulting colleagues and evidence-based research	Think of school-wide structures here especially others who might help. Might evidence-based research such as those available on Onlit be consulted for example? Consider a whole school approach - ask consultants speech and language and educational psychology specialists for example who typically have had extra

	training in morphology and language). Are there cross-school learning opportunities?
Teach reading and spelling as desk-based skill and drill with worksheets	Learning to read and spell is again a form of problem solving. There is much research directly on morphological problem solving specifically. Direct instruction is also key but modelling of processes and opportunities to practice in texts and for the purpose of communication are needed. Aspire to creating self-teachers of your students! As ever, motivation and success go together.

Across these first videos, I have been emphasizing that the 'technical complexity' of learning about how the English spelling really works 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**). Alongside phonology, morphology is also key features of written English, and its addition to our set of technical competencies as educators is key to our effectiveness. Now we have considered these processes in action in video 4 as the final piece of the jigsaw puzzle of word reading and spelling acquisition and teaching in English. You should now have all the tools in a toolkit to support strong foundations of word reading and spelling accuracy.

Summary and conclusion

We have considered	**We have learned**
1. What is the evidence-based research?	The evidence-based research 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 revised Ontario Language Curriculum tell us about the teaching of reading and spelling using morphology that I should I know about as a teacher?	The evidence-based research provides theory and evidence on how students learn to read and spell using morphology that shapes our evidence-based practice.

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 morphological word reading sub-skills aids word reading and spelling.
4. Practicalities – How do I teach reading and spelling with morphology using the science of reading?	Teach common prefixes and suffixes and morpheme identification morphological analysis (segmenting) and synthesis, (blending) and the consistencies and inconsistencies of morphemes in English.
5. Practicalities - When do I teach different aspects of morphology in reading and spelling?	On the firm base of oral language abilities. Sufficiently intensive to develop emerging fluency in reading polymorphemic words by middle elementary grades. 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 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?	The teaching of morphology is intimately connected to the teaching of word meanings.
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 morphological family learning first met in language arts.

Reflection points

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

2. How can we as a whole school (or early years group) work together on a really robust approach to early literacy development using this information and research?

3. How might we develop a community of practice here to develop together or work with my school board or other skilled professionals to advance practice?

In conjunction with the approaches we have considered in videos 1, 2, and specially video 3, you should now have all you need to plan and deliver a strong and highly impactful reading teaching experience for diverse learners.