

Blending Wheels

Tools for Decoding Practice

Holly Lane and Paige Cullen Pullen

Mrs. R is one of those teachers that every parent requests. In fact, some parents beg for their children to be in her class. After 38 years as a kindergarten teacher, she understands how to get the most out of her young students when it comes to reading. She is also a highly sought-after reading tutor for struggling older readers. When a child has difficulty learning to read, Mrs. R always seems to know exactly what to do. In particular, she seems to have a special gift for helping students learn to decode words. When asked what secrets she might share with a new teacher, she quickly replies, "I have two words for you: blending wheels." She goes on to explain that, of all the methods she has used over the years to help students practice decoding, nothing has ever seemed to work as well as blending wheels.

Learning to read is perhaps the most important accomplishment of children in elementary school. Unfortunately, most students with learning disabilities struggle to learn to read (Lane, Pullen, Hudson, & Konold, 2009), and difficulties in reading are their primary source of academic failure (Jenkins & O'Connor, 2001). Reading difficulties for students with learning disabilities are most often rooted in problems with phonological processing and decoding (Melby-Lervåg, Lyster, & Hulme, 2012). Understanding of the alphabetic principle—the notion that letters and sounds work in systematic ways to form words—is essential for skilled decoding (O'Connor, 2011).

Students need to learn to blend sounds effortlessly and automatically to become fluent decoders (Adams, 1990). Students with or at risk for reading disabilities often have more difficulty than others in developing blending skills (Qi & O'Connor, 2000), and for students who experience difficulty, additional practice may be necessary (Juel & Minden-Cupp, 2000; Torgesen, 1997). Blending wheels can provide such practice during small-group instruction or as an independent literacy center activity.

How Word Reading Skills Develop

Ehri and her colleagues (i.e., Ehri & McCormick, 1998; Ehri & Snowling, 2004) have described phases of development in word reading. As developing readers pass through the phases, their command of the alphabetic system becomes stronger and word reading becomes more proficient. Students in the prealphabetic phase have little working knowledge of letters or the connections between letters and phonemes. Rather than using alphabetic knowledge to read words, students in this phase attend to visual elements, such as logos or colors, and associate these features with the spoken word (Ehri & Wilce, 1985; Gough, 1993).

In the partial-alphabetic phase of word recognition, the reader's focus shifts from visual cues to phonetic cues to recognize words (Ehri & Wilce, 1985). During this phase, developing readers begin to recognize some letters in words and associate those letters with their

corresponding letter names and sounds. Students in this phase use partial alphabetic cues, often initial and final letters in words, in combination with other contextual clues to predict unfamiliar words (Ehri & Snowling, 2004).

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The partial alphabetic phase is important to decoding development because it is the point when phonemic awareness, letter knowledge, and connections between letters and sounds begin to emerge. During the partial alphabetic phase, it is important for readers to develop the understanding that spoken words are made up of discrete sounds, which can be blended and segmented. Isolating sounds in spoken words is a difficult task (Liberman, Shankweiler, Fischer, & Carter, 1974) because phonemic awareness is largely abstract, and phonemes are not typically isolated for any reason during the flow of normal continuous speech (Ehri et al., 2001; Moats, 1998).

Movement from the partial alphabetic phase into the full alphabetic phase requires extensive knowledge of how letters map to sounds (Ehri & Snowling, 2004). Readers in the full alphabetic phase have formed complete connections between letters and sounds as well as the blending skills necessary to analyze and decode complete words (Ehri & Snowling, 2004). In this phase, readers can differentiate among similarly spelled words and possess sufficient knowledge to decode spellings that they have never seen before (Ehri & Wilce, 1983, 1987) and to read new words by analogy to words they already know (Ehri & Snowling, 2004).

As a reader rapidly encounters and stores more new words in memory, the transition into the consolidated alphabetic phase begins. According to Ehri and Snowling (2004), readers in this phase have working knowledge of recurring letter sequences, including syllable patterns, affixes, roots, and onset-rime combinations. As the child is repeatedly exposed to spelling patterns across many different words, the patterns become consolidated units in memory that are bonded with pronunciations, which allows recognition of units within words that are larger than single letters, thereby speeding access of word parts and multisyllabic words from memory (Ehri & Robbins, 1992; Juel, 1983).

Teaching Students to Decode

Learning to decode requires phonemic awareness and an understanding of the alphabetic principle. Most students who struggle with decoding have weak phonemic awareness (Uhry, 2011), or the capacity to manipulate individual phonemes within words. Phonemic awareness, which is part of the broader construct of phonological awareness (i.e., the capacity to manipulate units of spoken language, including syllables, intrasyllabic units, and phonemes), forms an important foundation for the development of decoding skills, so developing phonemic awareness is a critical initial step in teaching students to decode (Troia, 2004).

Two types of research provide the evidence for the importance of phonemic awareness instruction: (a) correlational research and (b) intervention research. Numerous studies of phonemic awareness have contributed to the knowledge base in this area. These studies can and should inform future educational research and practice. Syntheses of this research (see, e.g., National Institute of Child Health and Human Development, 2000) have yielded several important generalizations:

- Phonemic awareness is directly related to reading ability.
- Although the relationship is reciprocal, phonemic awareness precedes skilled decoding.
- Phonemic awareness is a reliable predictor of later reading ability.
- Deficits in phonemic awareness are usually associated with deficits in reading.
- Early language experiences play an important role in the development of phonemic awareness.
- Early intervention can promote the development of phonemic awareness.
- Improvements in phonemic awareness can and usually do result in improvements in reading ability.
- Phonemic awareness interventions result in better improvements when instruction is combined with letters. When letters are added, this instruction is called phonics.

Blending and segmenting are the most sophisticated phonemic skills and the most important for application to decoding. Blending phonemes requires an individual to combine the individual sounds in a word or syllable into the whole (e.g., “*What word do these sounds make? /f/ /i/ /sh/.*” Students respond, “*fish.*” Teacher, “*Yes, fish!*”). Segmenting, or breaking the word or syllable into individual sounds, is the exact opposite of blending (e.g., “*I’m going to say a whole word. I want you to say it sound-by-sound. Frog.*” Students respond, “*/f/ /r/ /o/ /g/.*” Teacher, “*Yes, /f/ /r/ /o/ /g/. Frog has four sounds.*”). As students learn to decode words, they must blend sounds

together. As they learn to spell words, they must segment sounds to represent them with letters. Thus, teachers need to have a variety of ways to provide practice in blending and segmenting phonemes. Most of the time devoted to phonemic awareness instruction should be spent on these two important skills.

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An important generalization from the enormous research base is that phonemic awareness instruction is more effective when combined with letters (Boyer & Ehri, 2011; Ouellette & Haley, 2013; for a review, see National Reading Panel, 2000). This instruction is no longer purely phonemic awareness instruction, but phonics. Phonics is the instructional approach that teaches individuals the systematic relationship between letters and sounds, and how those sounds go together to make words. As previously mentioned, phonemic awareness and phonics are reciprocal in nature. One must have the fundamental insight and awareness of the sound structure of language—that the speech flow can be broken into smaller units of sound—to benefit from phonics instruction (Lane & Pullen, 2004). However, phonics instruction also improves phonemic awareness. Skills in blending and segmenting sounds orally and in matching letters (graphemes) to their corresponding sounds (phonemes) are necessary to develop phonemic decoding skills (see Table 1). Students learning to read need practice in blending and segmenting sounds in combination with their alphabetic symbols. A multisensory approach to such practice is particularly beneficial for struggling students because it makes the abstract task of

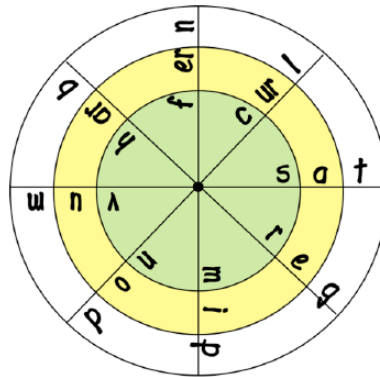
Table 1. What is Phonemic Decoding?

<p>Phonemic decoding is a strategy to “attack” or sound out new words.</p> <ol style="list-style-type: none"> 1. Practice individual letter-sound correspondences as needed. 2. Draw students’ attention to the internal structure of the word. Are there consonant clusters? Vowel digraphs? 3. Sound out words: <ul style="list-style-type: none"> o Identify each sound—segmenting o Say the word—blending (Hold out sounds that are continuous) /mmmmmaaaaaaaat/

phoneme manipulation more concrete (Campbell, Helf, & Cooke, 2008; Pullen & Lane, 2014).

Blending wheels can be used to provide practice with blending phonemes to make real words and pseudowords. The benefits of decoding practice with real words are clear, but using pseudowords for instruction is a bit more controversial. Pseudoword reading is widely recognized as a strong measure of decoding skills (Carver, 2003), and evidence indicates that it is also a valid practice for teaching decoding (Moats, 2000). Research has demonstrated that isolated practice with both real words and pseudowords improves decoding accuracy and automaticity (Pullen & Lane, 2014). Cardenas (2009) examined the use of pseudowords in kindergarten phonics instruction, comparing it with instruction that used only real words. Her results indicated that students who received phonics instruction with pseudowords demonstrated greater improvement in decoding than students who received phonics instruction using only real words. In addition, the pseudowords group demonstrated a higher rate of change than the real-words group even after returning to real-word phonics instruction. Therefore, Cardenas hypothesized that the phonetic decoding knowledge gained during pseudoword instruction continues to play a role in students’ decoding as they learn to read real words. Providing practice with pseudoword decoding requires that the child focus on letters and sounds rather than relying on sight word knowledge.

Figure 1. Sample blending wheel configuration



Blending Wheels

A blending wheel is a hands-on tool for decoding practice that promotes a focus on phoneme blending skills. A blending wheel consists of three concentric circles held together with a brass fastener. Each circle has letters on it that are combined to form words. The smallest circle on a blending wheel has initial consonants or consonant clusters. The second wheel has vowels, vowel digraphs, or other vowel combinations. The largest, outermost wheel has final consonants or consonant clusters. The letters on the three circles are aligned to form words or pseudowords. Figure 1 provides an illustration of a blending wheel.

The focus on letters and sounds provides explicit practice with the decoding process. Instruction in decoding should emphasize common letter patterns (Bear, Invernizzi, Templeton, & Johnston, 2011; Pinnell & Fountas, 1998). Including both words and pseudowords in instruction provides more opportunities to practice a pattern (e.g., *fun, sun, bun, stun, spun . . . lun, vun, zun, frun, blun*). Increased opportunities for practice are especially important for students with or at risk for reading disabilities to master strategies such as decoding (Deshler & Schumaker, 1993). Blending wheels may be constructed to include only simple consonant-vowel-consonant (CVC) patterns or more challenging consonant clusters (i.e., blends and digraphs) and multiletter vowel patterns (e.g., *r*-controlled vowels, vowel digraphs, diphthongs).

Although blending wheels provide expanded opportunities for practicing letter-by-letter decoding, word family wheels may be used to practice combining onsets and rimes (Lane & Pullen, 2004). Word family wheels are available commercially (see Table 1 for resources) or may be constructed in a manner similar to blending wheels. They may also be limited to contain only real words. One advantage of word family wheels is that they can be made self-correcting by including a picture to uncover for each word. Another advantage is that they can be created to include only words students have encountered and practiced in connected text. Although word family wheels are a great place to start, moving to blending wheels with individual letter sounds will offer students far more opportunities to respond. Increased opportunities to respond contribute to increases in attention and achievement (Oliver & Reschly, 2014).

How Do I Make a Blending Wheel?

To make a blending wheel, cut heavy card stock paper or poster board into circles. Using three different light colors of poster board works best. The circles should be approximately 4, 6, and 8 inches in diameter. Divide the circles into six or eight equal pie-shaped sections using a protractor and a dark marker. To make the wheels even more useful, draw these sections on both sides of each circle. On the lines near the outside of each circle, write the letter or letters for the initial (smallest circle), medial (middle circle), or final (largest circle) sounds. Make sure each letter rests on the line and aligns correctly with the letters on the other circles (see Figure 2). Use a sharp

Figure 2. Letter alignment on a blending wheel

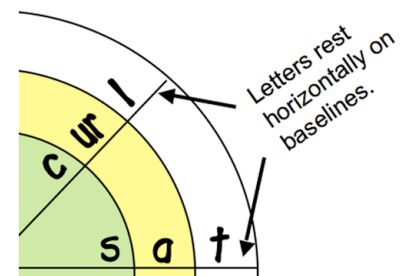


Table 2. Sources for Word Family Wheels

Books and materials	Source
<i>Phonics Wheels</i> (Gaydos, 2005)	Innovative Kids
<i>Turn to Learn: Word Family Wheels</i> (Charlesworth, 2000)	Scholastic
<i>Words Their Way</i> (Bear, Invernizzi, Templeton, & Johnston, 2011; includes an explanation of word family wheels)	Pearson
Phonics wheels (templates for a variety of wheels, including word family wheels and beginning letter wheels)	http://www.superteacherworksheets.com/phonics-word-wheels.html
Word wheels (several available to download)	http://www.abcteach.com/directory/teaching-extras-word-wheels-1935-2-1
Making Rhyming Word Wheels (instructions)	http://www.scholastic.com/parents/resources/free-printable/reading-printables/making-rhyming-word-wheels

instrument to make a hole in the center each circle; connect the three circles with a brass fastener.

The age and decoding skill level of your students should help you determine which letters or letter combinations would be appropriate (see Tables 2 and 3 for examples of letters for easy and challenging wheels). For example, beginning readers would do well with simple consonant-vowel-consonant combinations. To facilitate the development of blending skills, early wheels should be constructed to include mostly continuous consonants (e.g., /ff/, /n/, /s/, /v/), and stop sounds (/p/, /b/, /g/, /t/) should be introduced in the final position before attempting them in the initial position. More advanced students who are expanding their decoding skills may be able to use wheels with consonant clusters at the beginning and end of

words and vowel digraphs in the middle of words. A more challenging wheel might include endings that can be used to create a multisyllable word (e.g., *-ping*, *-ted*). Finally, a particularly challenging wheel could include complete syllables for students to combine to form multisyllabic nonsense words (e.g., *pre + sip + tion*; see Table 4). The use of more challenging blending wheels should follow the child's progression through Ehri's phases of word recognition development. As students are making the transition between the partial alphabetic and full alphabetic phases, for example, easy blending wheels are appropriate. Figure 3 illustrates the connection between student's development of reading skills and the types of blending wheels that are appropriate during each phase.

Making several identical wheels allows for teacher-led, small-group

practice. Alternatively, having a variety of wheels with different letter combinations allows for greater individual practice opportunities. Students should practice with a teacher before practicing independently, because the wheels are not self-correcting. Once they learn how to combine sounds on the blending wheels, students can work in pairs and challenge each other to blend new sound combinations.

How Do I Use a Blending Wheel?

Blending wheels can be used with individual students or with small groups, and with students at any age. When using the wheels with small groups, it is helpful to have a set of identical wheels. The first step is to show students how to line up the letters on the wheel to form a real word or a nonsense word. Then, demonstrate how to move the smallest wheel to change the initial consonant

Figure 3. Progression of blending wheel use

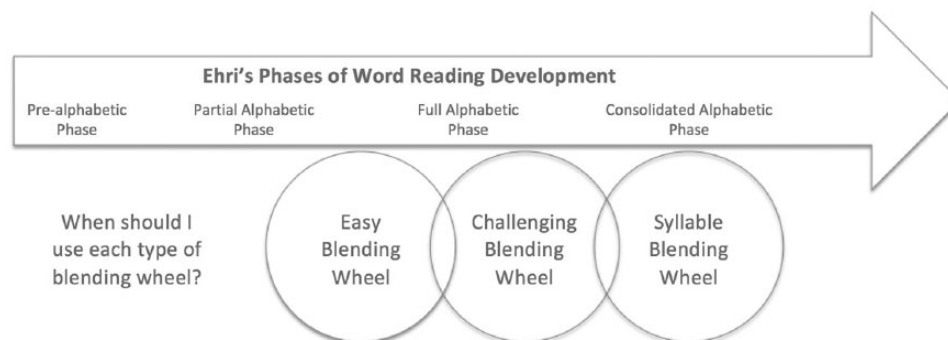


Table 3. Sample Letters for an Easy Blending Wheel

Small wheel (initial consonants)		Middle wheel (vowels)		Large wheel (final consonants)	
Side 1	Side 2	Side 1	Side 2	Side 1	Side 2
p	h	a	ar	n	d
s	l	e	er	p	f
v	n	i	ir	s	k
b	r	o	or	t	m
c	t	u	ur	z	p
g	w	ai	oi	b	sh
j	d	ee	au	g	ch
m	f	oa	ea	l	th

Table 4. Sample Letters for a Challenging Blending Wheel

Small wheel (initial consonants)		Middle wheel (vowels)		Large wheel (final consonants)	
Side 1	Side 2	Side 1	Side 2	Side 1	Side 2
bl	pr	ar	ou	st	lf
br	pl	er	ow	sp	nch
dr	sw	ir	igh	nt	nst
st	th	or	ie	ch	ling
sh	tr	ur	ew	th	ning
fl	spl	oi	oo	nth	ming
gr	str	au	aw	mp	ping
fr	spr	ea	ee	sh	ted

Table 5. Sample Letters for a Syllable Blending Wheel (Very Challenging)

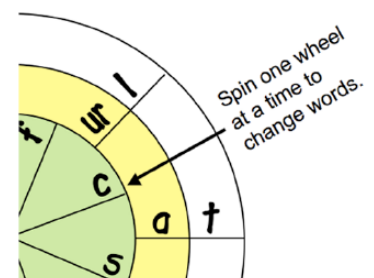
Small wheel (initial consonants)		Middle wheel (vowels)		Large wheel (final consonants)	
Side 1	Side 2	Side 1	Side 2	Side 1	Side 2
re	ag	gar	moun	est	tic
un	be	tas	tawp	ish	ly
in	or	sip	pight	ant	tion
im	ip	mug	bain	ith	ling
dis	fan	der	mewl	enth	ness
sub	lib	vos	moop	ist	ment
mis	tog	med	cown	utch	sis
pre	sep	rab	reeg	imp	er

and read the new word (see Figure 4). For example, after aligning *s-i-t*, the initial consonant wheel can be turned to change the word to *f-i-t* and *l-i-t*. Continue in this fashion until students understand how to make new words this way. Next, show them how to change the word by moving the large wheel with the final consonants, while keeping the remainder of the word intact. That is, *m-a-t* can be changed to *m-a-p* and *m-a-d*. Finally, after students have mastered the process of changing both the initial and final consonant, demonstrate how to move the vowel to change the word. For

example, change *l-e-g* to *l-o-g* and *l-a-g*. After practice with these variations, directions for moving the wheels can be altered after each word: “Move the small wheel to change the r in r-o-b to a j. What word does that make? Yes, job. Now, move the large wheel to t. What word did you make? Yes, jot. Now, move the middle wheel to u. What word did you make? Yes, jut! Keep spinning the middle wheel. What new word did you make? Yes, jat—is that a real word? No, jat is a nonsense word. What else can you make by moving just one wheel? Yes, jet . . . bet . . . bat . . . bit . . .”

Once students understand how to change the words in various ways, alter the wheel by flipping one of the circles

Figure 4. Move one wheel at a time to form new words





months of practice with progressively more challenging wheels, he could decode any word or pseudoword he encountered. Mac had never been taught to decode, but even as an adult, he was able to acquire the skills he needed using blending wheels.

Final Thoughts

Decoding practice significantly improves students' reading proficiency and is particularly beneficial for those who have or who are at risk for reading difficulties (Tunmer & Arrow, 2013). Finding effective ways to provide decoding practice for struggling readers can be a challenge for teachers. Still, this goal is essential for developing reading proficiency. As Adams (2001) explained, "The goal of helping children learn to recognize words quickly and easily is to ensure that word recognition will feed rather than compete with comprehension" (p. 78). The blending wheel is a simple but powerful and engaging tool for providing the decoding practice that so many struggling readers need.

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to introduce a new set of letters or letter combinations. By flipping one circle at a time, one wheel can be changed into multiple configurations. As students develop their basic decoding skills, introduce the more challenging letter combinations, such as blends (e.g., *br, fl, st, spl, mp*), *r*-controlled vowels (e.g., *ar, or, er*), consonant and vowel digraphs (e.g., *th, sh, ai, ea*), diphthongs (e.g., *ow, oi*), and other clusters (e.g., *nch, thr*).

Providing decoding practice such as this can help students become more fluent in their word reading and, therefore, in their reading of connected text. In fact, recent research has linked phonemic awareness skills to improved oral reading fluency.

Initially, blending wheels should be used with teacher guidance to ensure that students are using them correctly. Once students understand blending wheel basics, the wheels can be used as a paired or individual practice activity. Students can listen to one another and check their decoding attempts, or they can practice independently and check

their work with an adult. Students enjoy finding pseudowords with silly sounding pronunciations (e.g., *splarnch*). Because it is fun, students will practice and practice. Providing decoding practice such as this can help students become more fluent in their word reading and, therefore, in their reading of connected text. In fact, recent research has linked phonemic awareness skills to improved oral reading fluency (Ashby, Dix, Bontrager, Dey, & Archer, 2013).

Blending wheels can be used with struggling readers of any age. In fact, Holly (the first author) tutored Mac, a college student with dyslexia, using this method. When he was initially tested, he could not decode ip, the first pseudoword item on the word attack subtest of the standardized assessment battery. His response to the item was "I don't know that word. I've never seen it before." When Holly explained that it was a nonsense word and asked Mac to just sound it out, he replied, "Can you please tell me what you mean when you say 'sound it out'? People have said that to me all my life, but no one ever showed me how to do it." After pondering how to explain the concept of sounding out a word, Holly thought back to her conversation as a new teacher with Mrs. R. and decided to try using a blending wheel with Mac. Using this tool, he caught on quickly. After two or three sessions of practice with a blending wheel, he could decode any CVC combination. After a few

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Holly Lane, University of Florida, Gainesville; **Paige Cullen Pullen**, University of Virginia, Charlottesville.

Address correspondence concerning this article to Holly Lane, University of Florida, PO Box 117050, 1403 Norman Hall, Gainesville, FL 32611-7050 (e-mail: hlane@ufl.edu).

TEACHING Exceptional Children, Vol. 48, No. 2, pp. 86-92.

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