

*A Colorado professional learning series  
based on the book*

# Equipped for Reading Success

**by David Kilpatrick, Ph.D.**

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*Developed in collaboration with the Colorado Department of Education*



**COLORADO**  
Department of Education

Welcome back. We will continue our study of Dr. Kilpatrick's work.



# Module Six

**Continued:**  
Orthographic Mapping and Sight Word Learning:  
Technically

This is Module 6. It correlates with Chapter 4 in our manuals. Our focus will be Orthographic Mapping and Sight Word Learning.



### Goals for Module 6

- Learn how we make letter strings familiar
- Understand the connection between oral language and permanent storage of printed words
- Know the difference between phonic decoding and orthographic mapping
- Know and understand the 3 components of orthographic mapping
- Understand the process of permanent word storage and its importance to the reading process

Let's introduce the learning goals for Module 6. They include:

- Learn how we make letter strings familiar
- Understand the connection between oral language and permanent storage of printed words
- Know the difference between phonic decoding and orthographic mapping
- Know and understand the 3 components of orthographic mapping
- Understand the process of permanent word storage and its importance to the reading process

# Making Letter Strings Familiar: How We Map



Chapter 4: Orthographic Mapping and  
Sight Word Learning, pgs. 36 – 37

We have referred to and discussed orthographic mapping to insure accessible sight vocabulary. Let's see how the process works.



# Familiar Letter Strings

01

Immediately recognized without guessing or sounding out

02

Begin with automatic letter-sound skills

03

The sight of a letter is immediately recognized and effortlessly activates the sound that goes with it

04

Become unitized and the sounds associated with the entire letter string activates all the phonemes

05

Are processed as units without consciously treating individual letter sounds separately



1. We consider letter strings to be familiar if we can recognize them immediately. We consider these words part of our “sight vocabulary”. We can recognize these words and retrieve pronunciations without sound out or guessing.  
How does this happen?
2. It starts with developing letter-sound skills to automaticity.
3. When letter –sound correspondences are developed to automaticity, the sight of the letter automatically activates the sound or sounds that the letter makes. This happens so fast that cognitive scientists refer to it as “pre-cognitive” or it happens without conscious thought. This happens with both written and oral phonemes.
4. As phonemic awareness develops along with letter-sound knowledge, letter strings become what we call “unitized”.
5. Rather than each individual letter being activated, the entire letter string activates all the phonemes in that string, thus identifying a word.



# How Word-Parts Become Familiar

## Automatic Word Recognition

- Word parts, such as /ip/, are part of our existing oral language.
- /ip/ is familiar to students with phoneme awareness. It is also known as the *rime* of the word.
- It is stored in a student's oral dictionary as a *familiar word part*.
- /ip/ is familiar within words such as *dip, hip lip, rip, sip, zip, chip, trip, flip*.
- For a student with **poor phoneme awareness** this two-letter string will not anchor to anything in memory. He does not have an awareness that /ip/ is a common part of many words he knows. The reader considers it a string he has to just memorize.
- If a student has **strong phoneme awareness**, he notices parts of **oral words** as well as **written word units**. This promotes a **connection between the letter combination and its pronunciation**.
- **It is this connection that boosts immediate word recognition.**

Accurate

Automatic

When a children becomes automatic with the varied task of phonemic awareness, it creates a deep awareness of the patterns of speech and language. It also helps anchor sounds and symbols to memory. Dr. Kilpatrick says that once we become familiar with word parts such as syllables and onset & rime, we can orthographically map those as well as individual phonemes.

Read bullets on the page:

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# Eye Movement Research

Activation occurs simultaneously at the letter-phoneme level, the sub-word level, (parts of words) and whole-word level. None of them are optional and all are automatic for skilled word recognition.



Chapter 4: Orthographic Mapping and Sight Word Learning, pgs. 37 – 39

Eye Movement research by scientists such as Raynor and Pollatsek (1989) at MIT over the course of two decades showed that the eye fixates on words in a rapid series of stops and jumps called fixations and saccades.

From eye movement research, we have learned the following:

When we read, we process **every letter of every word we read**.

This allows us to differentiate between words that differ by only one letter. Ex. house, horse - friend, fiend

Research has demonstrated that we move across a line of text in little jumps called *saccades*.

If you watch a reader's eyes when they read, you may see a *jump-fixate-jump-fixate pattern*.

During a fixation, we take a quick picture of what we see.

When our eyes fixate, we take in 7-8 letters to the right of the fixation and about 4-5 letters to the left, creating a span of 11-13 letters.

Being able to see this letter span, automatically **activates recognition of the familiar letter string**, its pronunciation and meaning.

The word's **pronunciation and meaning** are simultaneously activated, because they are all connected in permanent memory.

Activation occurs at the letter-phoneme level the sub-word level and the whole word level.

# Accessing Word Meaning in Reading

Figure 4.3  
Accessing Word  
Meaning in Reading  
Chapter 4: pg. 38

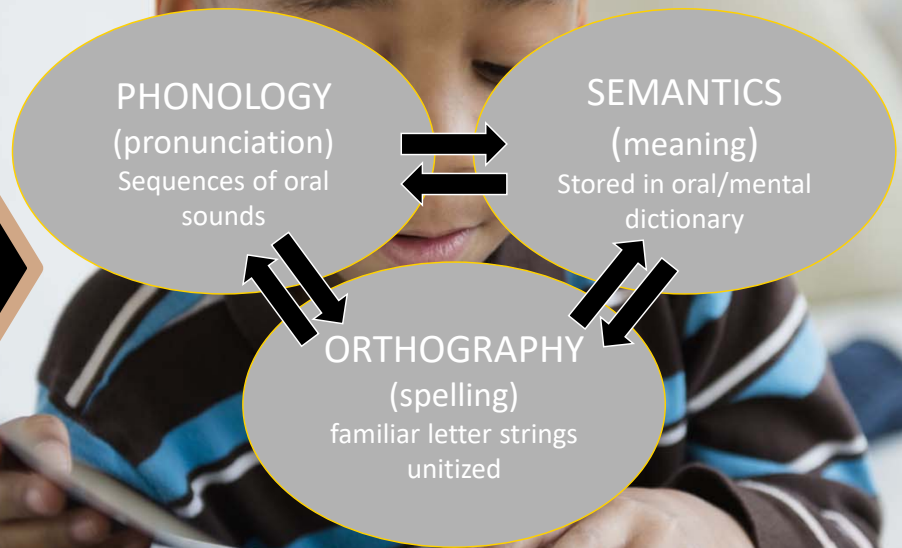


Figure 4.3 can be found on p. 38 of the manual. It shows the relationships between seeing letter strings in print, and the activation of both the word's pronunciation and its meaning. If a reader sees a word in print, its pronunciation and meaning are automatically activated. A word's pronunciation and meaning are connected in memory with the word's spelling. We refer to this as orthographic memory, because it is a **memory for a specific sequence of letters**.





# The System of Orthographic Mapping

- Our brains have access to all of the letters of a word at the same time.
- The process involves accessing a stored word based upon **its association between the letter string and the phonemes in the word's pronunciation.**
- The letter string **becomes familiar** because the reader has the phoneme awareness to **connect the oral phonemes in the word to the letters in the word.**
- Words that are **orthographically mapped** in our memory **have bonded the oral sounds in our mental/oral dictionary to the written letter strings.** The letter strings also activate the **meaning of the word.**
- Once a word is completely mapped, it is stored in our permanent memory, **is instantly retrievable**, and becomes part of our **sight vocabulary.**



Kilpatrick emphasizes that orthographic mapping is not simply a matter of visual memory, but a memory for a specific sequence of letters, or as he refers to it; a letter string. That letter string becomes familiar, and is unitized which helps it to be stored in our permanent memory. This process will be reviewed and examined several times throughout this chapter.

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## The Relationship Between Orthographic Mapping and Phonic Decoding

Chapter 4: Orthographic Mapping and  
Sight Word Learning, pg. 40



# Mapping vs Phonics

## Orthographic Mapping

- A two-way process that requires an awareness of phonemes in spoken words
- Goes from pronunciation to letters
- Uses sound-to-letter relationships to anchor phonemes into long-term memory
- Uses letter-sound skills to establish a *memory of printed words*

Both require proficiency with letter-sound relationships

Both are essential to reading

## Phonic Decoding

- Starts with an unfamiliar printed word
- Letters are translated into sounds and are blended together
- Goes from letters to pronunciation
- Uses letter-to-sound relationships to activate oral words from an unfamiliar letter string
- Uses letter-sound skills to *identify words*

Mapping and phonics should not be confused with one another. They are separate processes.. **Both require proficiency with letter-sound relationships, and both are essential to reading**, but use letter-sound skills differently.

### Phonic Decoding

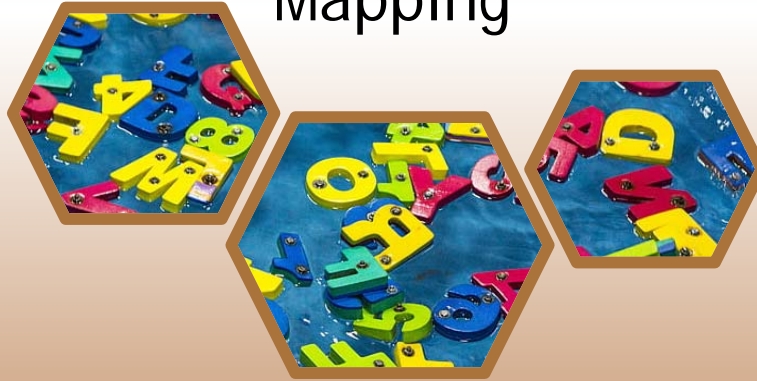
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### Mapping

- A two-way process that requires an awareness of phonemes in spoken words
  - Goes from pronunciation to letters
  - Uses sound-to -letter relationships to anchor phonemes into long term memory
  - Uses letter-sound skills to establish a *memory of printed words*
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- Both require proficiency with letter-sound relationships
- Both are essential to reading

# The 3 Components of Orthographic Mapping



Chapter 4: Orthographic Mapping and  
Sight Word Learning, pg. 41

Next we will look at the 3 components of orthographic mapping.



# Skills for Orthographic Mapping

To be good orthographic mappers, students need to develop 3 skills:



1. **Automatic letter-sound associations**
2. **Highly proficient phoneme awareness**
3. **Word study**

**Word Study** – The connection-making process used to remember words. It involves the process of matching the oral phonemes to the letters to establish secure memory for future retrieval. Beyond the early phases of reading, this connection forming process becomes automatic and unconscious. We store new words we encounter without even realizing it.

Here is how , as teachers, we can facilitate orthographic mapping. Let's look at the 3 critical skills that need to be developed in order to promote orthographic mapping:

1. Automatic letter-sound associations – This would be at the proficient level
2. Highly proficient phoneme awareness – automatic access to sounds in spoken words
3. Word Study and Kilpatrick defines word study as...

The connection making process used to remember words. It involves the process of matching the oral phonemes to the letters to establish secure memory for future retrieval.

# Getting Orthographic Mapping into the Knowledge Base of Teachers



Chapter 4: Orthographic Mapping and  
Sight Word Learning, pgs. 42 – 43

One of the frustrations that many reading researchers have is that although we know from scientific evidence what works with students, there is a disconnect between what the research says are best practices and how reading is taught in schools.. Let's look at some important information for teachers...



## The Bottom Line

We need to make sure students have **adequate phoneme awareness** and **letter-sound skills** right from the start.

Some key points we have covered...

We use our *oral* filing system to **store and retrieve “sight words”**.

Entry into our **permanent filing system** is at the **letter and phoneme level**.

**Familiar letter strings** are evident to readers who are aware that phonemes in spoken words are represented by letters in written words.

If a student **does not** have phoneme awareness, it is difficult to identify familiar letter strings and letter sequences.

Sight vocabulary develops **slowly** over time.

A **limited sight vocabulary** is the primary basis for poor reading fluency.

If a student is **poor at word recognition and fluency**, then **reading comprehension suffers** and all of a student's school experience is negatively affected.

We need to make sure students have **adequate phoneme awareness** and **letter-sound skills** right from the start.





## To Sum It Up



So let's review some of the critical points we have covered in this chapter...

1. **We do not store and retrieve words based on visual memory.**
2. **Any strictly visually-based teaching techniques are an inefficient use of instructional time.**
3. **Our phonological filing system is the basis for word memory and word recognition.**
4. **Phoneme awareness and letter-sound skills are critical to word storage and sight vocabulary development.**
5. **Students cannot read efficiently without these skills.**
6. **If we don't teach them, then who will?**



# Coming Up in Module 7

## Instructional Approaches to Teaching Reading

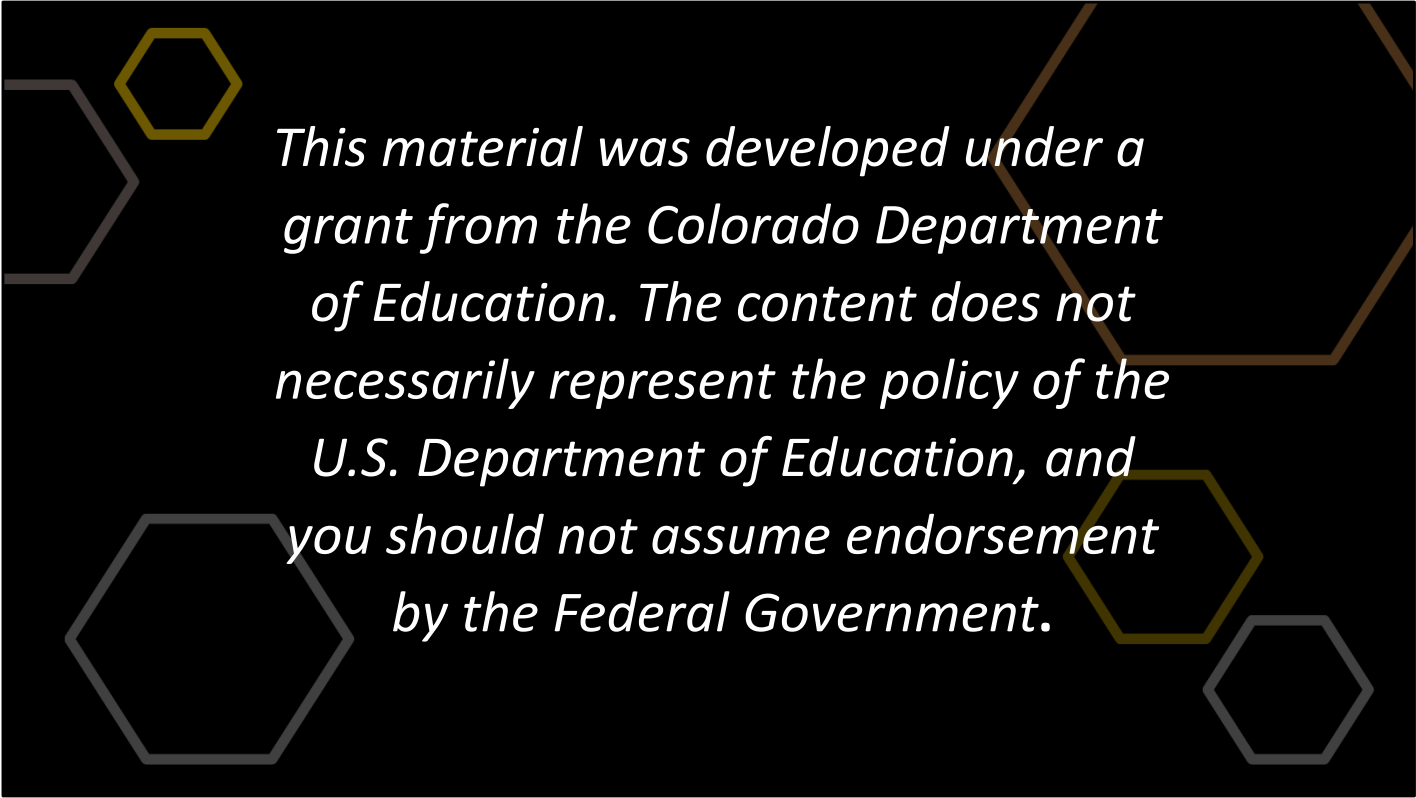
### *Chapter 5 – Teaching Reading in Light of Orthographic Mapping*

- Training Prerequisite skills for mapping
- Using Ehri's phases of Sight Word Development to guide the sequence of instruction
- Learning the sequence and hierarchy of phonemic awareness and orthographic development



In Module 7 we move on to the following topics;

- Training Prerequisite skills for mapping
- Using Ehri's phases of Sight Word Development to guide the sequence of instruction
- Learning the sequence and hierarchy of phonemic awareness and orthographic development

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*This material was developed under a grant from the Colorado Department of Education. The content does not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government.*



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Learning Disability website  
for more information:

<https://www.cde.state.co.us/cdesped/SD-SLD>

