

Chapter 13

Literacy Growth & Development

Paula Gross & Lyn Robertson

Introduction

The importance of literacy development in all children cannot be overemphasized—for education and the cultivation of knowledge depend upon a person's ability to read for the acquisition of knowledge as well as the enjoyment and appreciation of language and story. These are termed “the efferent” and “the aesthetic,” respectively, by Rosenblatt (1978). Much is involved in transacting with a text

of any sort for any

purpose, and Rosenblatt points out that every time a person reads a text—whether it is a sign, a paragraph, a chapter, or something else—a new comprehension result is produced, because the person



Photo courtesy of Oticon A/S

changes over time in terms of his or her background knowledge, purposes for reading, and mood at the time of the reading. These matters have great bearing on whether and how individuals, including individuals who are deaf/hard of hearing (D/HH), are able to make use of information and story in order to navigate their worlds in meaningful ways.

In this chapter, we address the literacy development of the child with some degree of hearing loss—all the way from mild to profound. Our emphasis is children whose families have

chosen a listening and spoken language (LSL) approach. For information on literacy with a focus on students using a sign language approach, see Trezek, Wang, and Paul (2010). For a discussion of studies of literacy development in children with hearing loss, see Robertson (2014). The student who has access to LSL is at a distinct advantage

The importance of literacy development in all children cannot be overemphasized.

for making academic progress, because academic work depends so heavily on being able to read and write at increasingly more complex levels. Fortunately, using LSL approaches with children with hearing loss is a promising way of making sure they develop the requisite language capabilities underlying literacy.

Literacy as a term encompasses the interaction of all the ways people come to use language.

Literacy as a term encompasses the interaction of all the ways people come to use language. While it is commonly thought to refer simply to reading and writing, in fact the interaction of listening, speaking, reading, and writing all function to produce thinking, which in turn informs the processes of listening, speaking, reading, and writing. At the beginning, a child learns

to listen and after a time begins to speak as though she or he has been “filled” up with language in order for it to begin to spill out into speaking. But listening and speaking are in constant flux, with each affecting the development of the other. Soon, if enough opportunities and experiences present themselves, the child begins to explore and experiment with reading and writing, and a lifetime of thinking using these four processes based on spoken language begins. This is the case for children with typical hearing and for children with hearing loss as well. Please note that this chapter focuses on reading development and recognizes that writing development as its expressive counterpart.

A Framework for Understanding Literacy

Scarborough (2001) offers an illuminating way of understanding the interaction of the many processes involved every time a person reads a text (see *Figure 1*). As literacy develops to the skill levels required for in-depth comprehension and appreciation, the reader learns to direct these processes with intention and execute them with a high degree of automaticity. The literacy goal is that the child becomes skilled at identifying and bringing meaning to the words on the page and putting them together so that comprehension results.

First, though, such identification and comprehension must be achieved using spoken language. Much spoken language knowledge is required for the words on the page to make sense—particularly at the beginning. Making meaning of the words on the page depends upon

the child having the words in his or her mental lexicon—complete with a way to pronounce them. Scarborough writes about children with typical hearing, yet the categories she lays out apply to all readers of a spoken language. Indeed, the child with hearing loss with whom a LSL approach is used is in the same situation as the child with typical hearing. The fact that he or she may not have acquired age-appropriate spoken language capabilities does not mean that these abilities cannot be developed through more emphasis on and practice with using spoken language in a wide variety of ways.

In this chapter, we discuss Scarborough’s eight categories in terms of hearing and listening and emphasize that if a child/reader is weak in one area of processing, the overall process of reading and writing suffers. LSL therapy naturally focuses on developing categories 1-6 (Estabrooks, 2012, 2016).

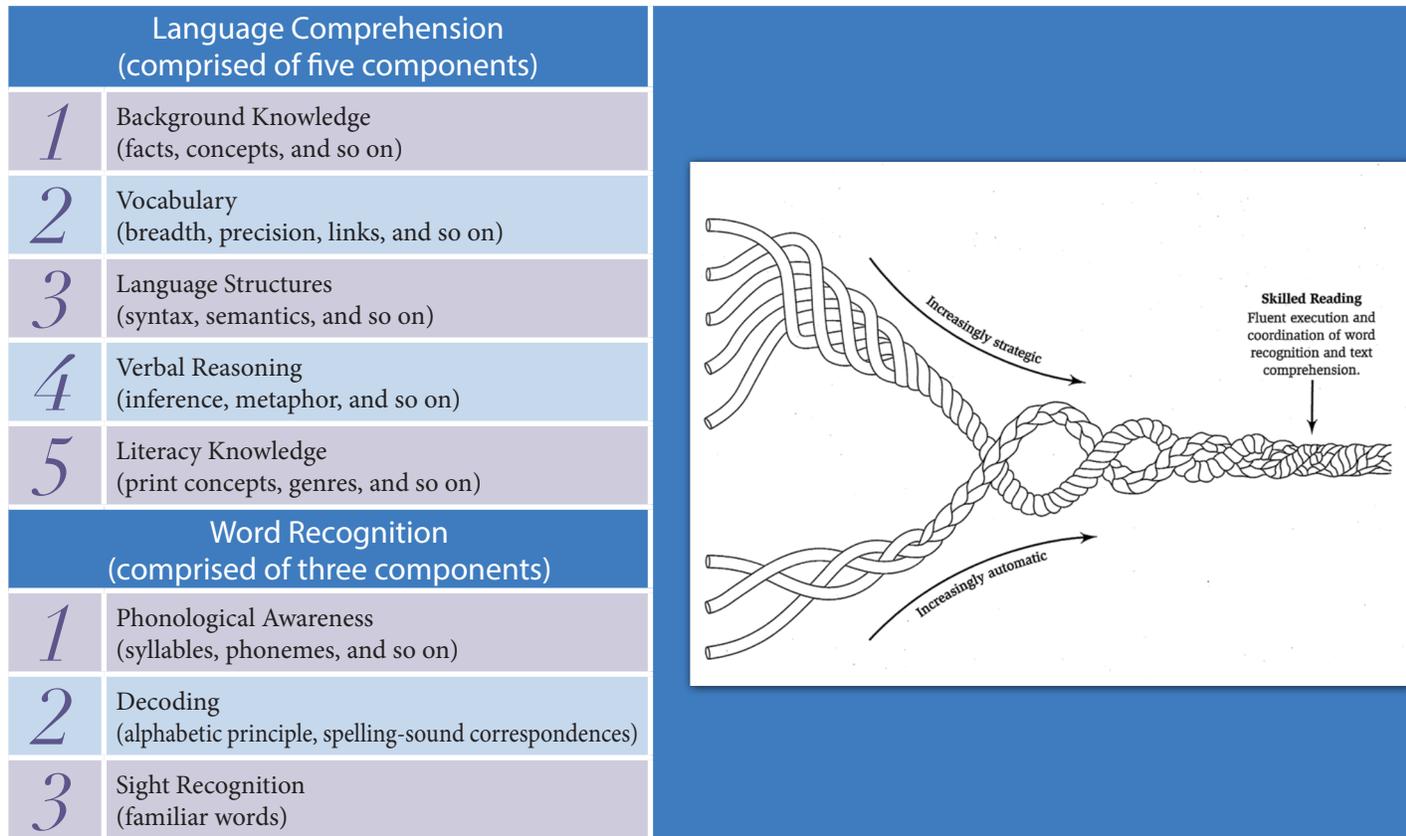
Scarborough divides the eight categories—or strands—of early literacy development (2001, p. 98) into two sections—language comprehension and word recognition. Scarborough places language *comprehension* first, because language knowledge is a prerequisite for *recognizing* words on a page.

Language Comprehension

Cognitive psychology provides us with Schema Theory—a durable theory that enables us to conceptualize what the reader does in interacting with an experience in life or in text. Rather than only taking meaning *from* the text, the reader can be seen as *interacting* with text and making meaningful sense of it by using both prior knowledge and experience as well as linguistic and procedural knowledge. All such knowledge is stored in a person’s memory in networks of idea units—or schemata (the plural of schema)—that overlap and connect with each other—often in flexible ways. When confronted with an experience in life or text, the person uses his or her memory structures to construct its meaning.

One task for the reader is to connect what is new on the page to what he or she already knows. Problems arise when the reader’s prior knowledge is not sufficient or if it does not become activated during the reading process. The fact that different people have had different experiences and have learned different conventions and procedures accounts for different interpretations of the same texts by different people. Schemata are defined as operating in a number of ways (Anderson, 2004, pp. 598-599; see *Table 1*).

Figure 1
Many Strands Weave Into Skilled Reading



Source: Scarborough (2001)

Table 1
Ways That Schemata Operate

1	Schemata contain “slots” that enable reasonable prediction making. For example, if the text is about planting a garden, the reader who has some gardening experience expects to read about seeds or seedlings, soils, seasons, and so on.	4	A schema is helpful in searching one’s memory in putting together the series of steps needed in planting a garden in order to tell someone else about it. The seasoned gardener will be better at recounting a text on the subject in appropriate order than the novice.
2	Schemata help the reader decide where to put his or her attention. To continue the gardening example, the reader with gardening experience may decide to give greater thought to details in the text about the amount of moisture needed by the particular plants he or she is interested in cultivating during a particular year.	5	The interaction of schemata help one to decide how to describe the text, depending upon what one judges to be most important.
3	Schemata help the reader make inferences. Knowing about the cycle of planting, watering, and harvesting vegetables helps the gardener look for similarities and differences in information about planting flowers.	6	Schemata help one remember and decide later on what the text must have included. For example, it would be reasonable to assume that the gardening text probably didn’t mention how to take a trip.

An important part of comprehension is *comprehension monitoring*—the ability to think about the meaning one is making while reading. This involves expecting the reading to make sense and stopping to question and consolidate the meaning one has made.

Schema Theory explains why it is crucial for children with hearing loss to be introduced to many different experiences and the spoken language that represents them. These need to be concrete life experiences as well as virtual experiences gained through the shared reading of books with adults. Meaning cannot be created from words in the absence of some connection with experience and the words that describe it.

Vocabulary

“Knowledge as it relates to reading is closely linked to vocabulary” (Marschark and Hauser, 2012, p. 105). The term “vocabulary” involves current and evolving understandings of the concepts and contexts represented by words. Simply put, vocabulary is the body of words a person must know in order to comprehend both spoken and written language, and effective communication cannot proceed without such content held in memory. Because the ultimate goal of reading is comprehension, vocabulary is of critical importance in enabling readers to bring meaning to print. A reader uses his/her own background knowledge and experiences and makes sense of text by linking this background knowledge with both actual and virtual experience. For this reason, vocabulary is linked to reading comprehension and academic success.

The National Reading Panel of 2000 identified vocabulary as one of five core components of effective reading instruction:

1	Phonemic awareness
2	Phonics
3	Fluency
4	Vocabulary
5	Comprehension

For children with typical hearing, during the language acquisition years, most vocabulary is learned incidentally in various oral language contexts. Even so, direct vocabulary instruction is still needed, especially when one considers the number of words that students need to learn: “On average students should add 2,000 to 3,000 new words a year to their reading vocabularies” (Beck, McKeown, & Kucan, 2002). This statistic signals a more daunting challenge for the child with a hearing loss. Learning to listen and speak during frequent interactions with adults and other children is essential.

“Knowledge as it relates to reading is closely linked to vocabulary.”

Historically, acquiring sufficient vocabulary has been a particular challenge for children with hearing loss. Smaller vocabularies can result from language delays secondary to deafness. Prior to current practices that include newborn hearing screening and the use of ever-advancing technologies, Paul (2001) commented, “Because of their reduced access to auditory and oral language, children who are deaf and hard of hearing typically bring a partial and still-evolving language system and an impoverished vocabulary to early reading instruction” (Trezek, Wang, & Paul, 2010, p. 124). We are now in an era in which a diagnosis of deafness no longer signals these limitations (Madell, 2015).

Literacy theory regards beginning readers as able to identify in print a small portion of the words in their receptive and expressive vocabularies. They make sense of the words they see in print by using the sounds and words they have heard or said. If the words they know in this way are limited, they are at risk for failure in developing adequate reading and literacy skills commensurate with hearing peers and must be provided with explicit instruction in basic vocabulary and oral language (Trezek, Wang, & Paul, 2010, p. 121-122). The LSL approach is an ideal way to work with children from the earliest age possible on developing and expanding their vocabularies. A framework for effective vocabulary teaching for all children, especially those with hearing loss, includes both direct and indirect instruction techniques, provides horizontal and vertical vocabulary expansion, and targets both content and function words.

Indirect learning occurs naturally in everyday language exposure and experiences with conversation and written language, being read aloud to by an adult, and later through independent reading. Reading aloud with children is one of the most effective means of assisting vocabulary building. Conversations before reading establish a purpose (enjoyment, information, communications, etc.) and help provide background knowledge (setting, author, characters, general knowledge, and the vocabulary that refers to them). Conversations during reading help monitor comprehension and help children create mental images. Conversations after reading help a child respond to text through making personal connections and expanding ideas (Vacca & Vacca, 2010; Yopp & Yopp, 2010). An additional important

Reading aloud with children is one of the most effective means of assisting vocabulary building.

benefit is that through these conversations, the adult provides a role model of fluent reading. Independent reading builds confidence, improves vocabulary knowledge, and allows for the choice in selecting materials that promotes reading for pleasure.

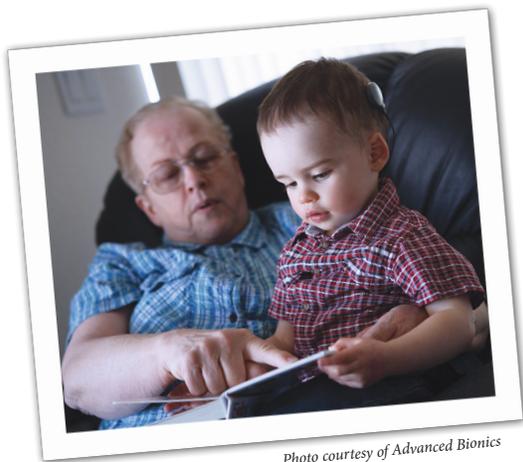


Photo courtesy of Advanced Bionics

Direct instruction promotes vocabulary acquisition, particularly as academic content becomes increasingly complex or technical and deals with abstract concepts. Teaching strategies include:

- Specific word instruction where the focus is on individual words and their corresponding meanings.
- Word-learning strategies that utilize dictionaries and other reference aids.
- Word analysis in which word parts and origins are studied (Trezek et al., 2010, p 123).

The use of pictures or other visuals and authentic representations of targeted vocabulary also aids in instruction.

Vocabulary instruction should promote horizontal and vertical expansion. Williams (2012, p. 28) explains: “Horizontal expansion refers to adding features to current definitions. An example is the knowledge that whales, porpoises, and dolphins are not fish but rather mammals. Vertical expansion allows for deeper understandings of words, such as their nuanced and multiple meanings. Word nuances include degrees and shades of meaning.”

For example, how can a student distinguish between these words:

Warm	Brisk
Hot	Chilly
Burning	Cold
Boiling	Cool
Scalding	Frigid

Although the words are similar, they are different in degree and can be learned through comprehensive instruction of multiple meanings, synonyms, antonyms, and the use of graphic organizers addressing examples, nonexamples, and attributes.

Content words and function words must both be addressed in vocabulary instruction for children with hearing loss. Trezek (2010, p.126) defines content words as “nouns, verb, adjectives, and adverbs, or words that can express an idea or concept.” Function words, on the other hand, are those words, such as articles, determiners, pronouns, and prepositions, that convey something about the relationships between and among people, places, and things. Trezek reminds us that “function words provide semantic and grammatical connections between content words” (2010, p. 126). Function words are often abstract in nature and can be difficult to learn for a child who is deaf, especially if the child is not immersed in LSL by listening to it and conversing in it.

Kamil (2004) suggests the following practices to improve vocabulary learning:

- Integrating new words into a child’s background knowledge.
- Providing repetition and multiple exposures.
- Providing conceptual frameworks for new words.
- Utilizing a variety of methods to meet needs of individual students.
- Preteaching of specific words before reading.
- Restructuring of vocabulary tasks as needed.
- The use of technology to enhance instruction.

Acquiring adequate vocabulary knowledge will help students develop comprehension and critical thinking skills (Vacca & Vacca, 2002; Vacca & Vacca et al., 2010; Yopp & Yopp, 2010).

In choosing strategies for teaching vocabulary, the teacher and therapist need to keep in mind the need for new words to be built upon the concepts and words the child already knows. This involves eliciting known concepts and words, so that the child is aware of them as new ideas that fit with them are introduced. Attempting to teach words in isolation is less successful than helping the child pay attention to his or her schemata and incorporating new information into them.

In *Reading and Learning to Read*, Vacca and Vacca et al. (2010) suggest the following principles to guide vocabulary instruction:

1	Choose words that the students will encounter during reading. This would include both words that are crucial to understanding content and those that are interesting and unique.
2	Teach words in relation to others, as with synonyms, antonyms, and words with multiple meanings.
3	Relate words to students' background knowledge.
4	Use prereading activities to generate interest, teach vocabulary, and follow-up with post-reading activities/responses.
5	Teach words systematically. Students should know more than a textbook definition. Provide them with opportunities to share definitions in their own words, use newly learned vocabulary in sentences they create, or relate vocabulary to their own experiences.
6	Generate enthusiasm for words and make vocabulary learning fun. Use technology and incorporate pictures, charts, and other visuals. Teacher-made games or adaptations of commercial games, such as Scategories, Pictionary, Balderdash, and/or Outburst, can also enliven vocabulary instruction.

Williams (2012) also suggests guidelines for vocabulary instruction that include using vocabulary role-play, hands-on activities, and visualization. Utilizing graphic

organizers, such as Venn diagrams, Semantic Feature Analysis Charts, and Word Chains, allow students to classify words by attributes, compare and contrast, and link new words to previously learned concepts. Similarly, Johns and Lenski (2010) provide step-by-step directions and resources for enhancing vocabulary skills. The interested practitioner is urged to consult these sources.

The language foundation is established early in the home environment, with its development spanning the school years and beyond.

Language Structures

As Scarborough points out, language knowledge and comprehension are prerequisites for reading. Indeed, language development and literacy development are intertwined and dependent upon one another. The language foundation is established early in the home environment, with its development spanning the school years and beyond (Williams, 2012). Bloom and Lahey (1978) maintain that language has three components—form, content, and use—and that when these three components interact, language occurs. They further assert subsystems within these three components, and that children who are deaf will need instruction within each of the five subsystems to ensure mastery of language and literacy (see *Table 2*).

Table 2
Language Components & Subsystems

Content	<ul style="list-style-type: none"> Semantics—meaning system
Form	<ul style="list-style-type: none"> Morphology—word parts Syntax—word order Phonology—sound systems
Use	<ul style="list-style-type: none"> Pragmatics

Content

Semantics. Under the broad system of content is the subsystem of semantics—or put another way, knowledge about the real, the abstract, and the imagined coded in language: knowledge about people, objects, actions, events, and relationships. Skills within this subsystem include vocabulary growth and development. They are of critical importance, because they ultimately affect reading comprehension and allow the reader to bring meaning to print, as discussed earlier.

Form

Subsystems in the form category include morphology, syntax, and phonology. Literacy skills that comprise these subsystems are structural analysis; word identification strategies; and syntactic, phonological, and phonemic awareness.

Morphology. Morphology deals with morphemes, or the smallest unit of meaning within a language. “As building blocks of a language, phonemes and morphemes are combined to form words and phrases” (Trezek, Wang, & Paul, 2002, p. 51). There are two types of morphemes: free and bound. Free morphemes are those that can stand alone as a word with meaning, such as *cat*, *run*, and *house*. Conversely, bound morphemes are those that cannot stand alone, such as prefixes and suffixes. Bound morphemes must be attached to a free morpheme to have meaning. For example, the bound morpheme *-ing* is meaningless by itself, but when added to a word such as “*jump*,” it changes the tense of the verb, thus indicating a grammatical change.

There are two categories of morphemes: derivational and inflectional. Derivational morphemes are those suffixes and prefixes that can change a word’s meaning or category of a word, such as when one adds the prefix *-un* to the word “*happy*.” A word with a completely different, in fact, opposite meaning can be created—*happy* vs. *unhappy*. Inflectional morphemes are suffixes that indicate tense, plurality, or possession. For example, when adding the suffix *-ing* to a word such as “*jump*,” the verb tense becomes the present progressive form:

“*jumping*” can also function as a noun. Likewise, adding the suffix *-s* to a word changes it to its plural form, as with “*cat*” vs. “*cats*.”

In ways similar to vocabulary development, children with typical hearing are exposed to morphemes through everyday incidental learning experiences and arrive in kindergarten with a basic mastery of English morphemes. “When children enter school, learning about word parts becomes a topic of formal language instruction referred to as ‘structural analysis’” (Williams, 2012, p. 67). Structural analysis provides students with working knowledge about word origins, root words, base words, suffixes, prefixes, and compound words. Similarly, some specific word structure knowledge, such as Greek or Latin origins, can aid in comprehension of complex vocabulary within the realm of science and technology so often prevalent within academic content in secondary and higher education.

“When children enter school, learning about word parts becomes a topic of formal language instruction referred to as ‘structural analysis.’”

Williams suggests the use of word sorts, where groups of words are classified by various characteristics. For example, words with prefixes might be sorted by the meaning of the prefixes (*re-*, *un-*, *mis-*) or suffixes, such as those used to change adjectives into adverbs (*-ly*). These word sorts can be open (the student decides the grouping criteria) or closed (the teacher defines such criteria), and many possibilities exist. This strategy is also useful for vocabulary enhancement, and open sorts can engage students in higher-level

thinking skills. Other suggestions include semantic and concept mapping (e.g., see Frayer et al., 1969; Buehl, 2001). Morphemic development is critically important to achievement in comprehension and informs writing, spelling, and the expansion of vocabulary.

While morphology is concerned with the structure of words and word parts, syntax focuses on how these words are ordered and arranged to create phrases and sentences that conform to the rules of the spoken language used in a child’s environment. By about the age of five, the average child with typical hearing has acquired the structures of the spoken language (Fry, 1966; Ruddell & Ruddell, 1994). She can understand and create sentences of various types, even when they are rearranged syntactically.

For example:

1	Leila went to school on the bus, because she liked to be with the other kids.
2	Because she liked to be with the other kids, Leila went to school on the bus.
1	Jack hit the ball with the bat.
2	The ball was hit by Jack with the bat.
3	The ball was hit with the bat by Jack.

Being able to manipulate the structures and add new content is an important meaning-making skill that speakers of a language make use of throughout their lives. Without this foundation, a reader/writer is at a distinct disadvantage.

Syntax. Readers may use syntactic knowledge when presented with new or unknown words by replacing the unknown with possible words that are the same part of speech in an effort to determine meanings. Poor syntax skills may also have a negative effect on writing skills. While extensive shared reading experiences help children learn much about written language, explicit teaching of grammar, punctuation, and mechanics is usually necessary. Other teaching recommendations include having students do the following (Snow, Griffin, Burns, 2005, pp. 97-100):

Arranging and rearranging words of sentences that have been cut apart and mixed up.
Making several short sentences into one long one.
Paraphrasing.
Reducing very long sentences into smaller ones.
Exposing students to texts with varying levels of linguistic complexity.

Phonology. The final subsystem of form is phonology—the sound system of a language and the rules that govern combinations of sounds. Phonology has long been viewed as critical to reading success and is accessed by skill in phonemic awareness, the foundation for access to the alphabetic principle, decoding, and phonic coding, all described in the *Word Recognition* section.

Use

The third component of language is use, and its corresponding subsystem is pragmatics, which governs the use of language in social contexts. “In addition to learning the content and form of language, students must also learn the use of language” (Williams, 2012, p. 95). Within the typical classroom, communication between teachers and students is often more formal than casual conversation, and students may need guidance to navigate its nuances. Williams (2012) also maintains that “pragmatics in reading also refers to knowledge about books, including text features and patterns.”

Verbal Reasoning

We can say that:

Reading comprehension is built upon a foundation of verbal reasoning.
Reading comprehension is verbal reasoning.
Reading is thinking.

In considering these statements, we further our concept of reading by doing—and writing about—the very verbal reasoning we are investigating.

To say that something intangible (verbal reasoning) is built upon a foundation is to compare its elements to those of an actual structure made of wood, brick, steel, concrete, and/or stone. This metaphoric language alludes to our general knowledge of how a building rests upon and is supported by some sort of wall or framework, and that without such support, the building would fall down. So comprehension depends greatly upon being able to reason in terms of words—just as the building depends upon its foundation in order to stay in place.

To say reading comprehension is verbal reasoning is another metaphoric way to make the same point—this time in an even more direct way. Without the reasoning done by manipulating words in relation to each other, there will be no comprehension. Such reasoning about metaphoric language

“In addition to learning the content and form of language, students must also learn the use of language.”

takes into account the various ways the reader knows how to use the words used in the comparison. For example, one might say, “My computer is an antique, and I hope I’ll be able to trade it in.” For people steeped in computer use, this is normally thought to mean that the computer being referenced is at least three years old. But one definition of an antique includes that it is at least 50 years old, and that it’s not used much in the present. Sometimes the definition includes that it is valuable. Verbal reasoning—using this metaphor—comes to see that the term “antique” is being stretched and made ironic in this case. The inference is made that the person’s computer is older than three years, is useless in current technological terms, and is anything but valuable.

Making inferences involves mental gymnastics (another metaphor!) in which the listener or reader considers what might be the case if a word is defined in one way or another. In the “antique” case, the “50-years-old” sense of the word is impossible, because computers haven’t been in general use for that length of time. So it is discarded as not applicable, and the listener/reader must reconsider. Having the knowledge that people trade in old items for newer ones allows for an adjustment of what it means for a computer to be old.

Other verbal reasoning may hinge on sequencing events or items according to a known structure, such as counts from 1 to 10; rating systems, such as “good, better, best;” and extremes represented by antonyms, such as cold vs. hot, slow vs. fast, tiny vs. huge. Conventional ways of expressing such structures (from the least to the most in these examples) help people share their verbal reasoning with each other, and readers and writers in particular social settings come to depend upon others having knowledge of and facility with the same ways of thinking.

Literacy Knowledge

Literacy knowledge is gained over a lifetime and begins with initial communicative attempts as an infant. These early communication behaviors grow into conversations and social interactions as children play, explore, and manipulate their environments. They attempt with increasing success to copy adults and build language and cognitive skills that promote learning to read. Through these actions, they also learn print concepts—the foundation of later reading and writing skills.

Concepts of print include learning book handling behaviors and directionality of print—that in English we read from top to bottom and left to right, one line at a time. From early experiences with print, children learn that symbols and letters are associated with particular meanings. For instance, how many children recognize the golden arches for McDonald’s? Children learn that pictures within a storybook correspond to print, and print is what we read. Learning the purpose and use of punctuation also fits here. Marie Clay calls these concepts about print “the rules of the road” as children develop literacy skills (Clay, 2000, pp. 24-25).

These print concepts evolve further as children mature and come to understand elements of literature through exposure in academic content and in reading for pleasure as well. They learn the elements of literature, such as author, main characters, setting, etc. They also learn that there are different types or genres of text, such as fiction, nonfiction, or informational text, and that each serves a different purpose. Further categorization includes genres, such as poetry, fantasy, fairy tales, science fiction, realistic or historical fiction, legends, mystery, myths, and fables. Duke and Purcell (2003) define a genre as “a form of text that uses a particular format and structure.”

Literacy knowledge is gained over a lifetime and begins with initial communicative attempts as an infant.



Photo courtesy of NCHAM

Genre categories often overlap, and using a variety of them helps students build background knowledge and strategies to approach and respond to new and/or unfamiliar texts. For instance, nonfiction materials generally comprise science instruction, so exposure to informational text helps the reader develop a familiarity with such text. Features of this text might include bold typeface and the use of tables, figures, and diagrams that are not present in other types of materials. Teachers and parents should also share that good readers often read a variety of books and encourage students to do so too.

Donalyn Miller (2009, p. 34) writes of her teaching experiences . . .

“Students need to be surrounded with books of all kinds and given the opportunity to read them every day. Conversations about reading—what is being read and what students are getting from their books—need to be an ongoing event. In my classroom, students have access to hundreds of books of all genres and reading levels and encouragement to read widely.”

Word Recognition

Phonologic skills can be viewed along a developmental continuum where skills are acquired incrementally. Initially, phonological awareness develops when a child first begins to notice differences among sounds. Next, phonemic awareness skills develop—providing the child with the ability to hear and manipulate specific sounds. This generally happens in play when children are exposed to nursery rhymes, songs, finger plays, and games, such as *Ring around the Rosie* or *The Farmer in the Dell*, for example. Finally, skills prompted by phonics instruction emerge, allowing the child to recognize and interact with sounds in print (Easterbrooks & Estes, 2007, p. 111). According to Adams (2002), when children discover the relationship between a few sounds and letters, they develop a sense of the alphabetic principle and then are able to apply the principle to the rest of the letters and their related sounds.

Williams (2012, pp. 80-81) identifies and explains specific skills associated with the acquisition of phonemic awareness and phonics knowledge (see *Table 3*). These phonemic awareness skills are considered to be important foundational skills for later reading success and accordingly have been identified as critical

components of effective reading instruction by the National Reading Panel (2000).

While phonology has been viewed as a key factor in word identification skills, research in deaf education has been fraught with controversy as educators and other professionals grapple with questioning whether or not deaf readers use phonologically based codes (Williams, 2012, p. 79). But with advances in technology for cochlear implants and assistive listening devices, children who are deaf are increasingly able to access all aspects of spoken language, including phonology, and difficulties in language acquisition, literacy, and academic progress can be avoided or at least minimized (Joint Committee on Infant Hearing, 2007).

Beyond making it possible for children to listen, the development of phonologic skills can be accomplished in many ways. There are numerous approaches and an abundance of commercial curricula available. Programs that provide students with systematic/explicit instruction allow for practice and review, but these should not comprise a whole reading program. Additionally, the importance of promoting such awareness through the use of authentic literature and other classroom reading materials and activities cannot be overlooked.

Decoding

The natural extension of sound to symbol skills is the understanding of the relationship between the sounds and letters. Decoding is the application of the alphabetic principle. In one way of describing this phenomenon, when a new word is encountered, a reader identifies the individual letters in the word, matches the letters to known sounds, blends the sounds to produce a word, says the word, recognizes the word, and attaches meaning to it. One cannot assume, however, that the words a child can decode are understood. Easterbrooks and Estes (2007, p. 111) caution, “Decoding should be practiced within the context of words within a child’s vocabulary.”

The natural extension of sound to symbol skills is the understanding of the relationship between the sounds and letters.

Table 3
Specific Skills Associated with Phonemic Awareness & Phonics Knowledge

Phoneme Isolation	Phoneme Identity	Phoneme Categorization
Identifying individual sounds in words.	Ability to recognize common sounds in a series of words.	Ability to identify which word in a set of words has a sound different from the others.
<i>"What is the first sound in fat?"</i>	<i>"What sound is the same in day, dog, and deer?"</i>	<i>"Which word has a different first sound: run, red, mop?"</i>
Blending	Phoneme Segmentation	Deletion
The ability to form words by combining a series of phonemes presented orally.	Identifying and counting the number of phonemes in a word presented orally.	Identifying a word that remains when a phoneme is deleted.
<i>"What is /d/ /o/ /g/?"</i>	<i>"How many sounds do you hear in cat?"</i>	<i>"What word is left when you take away /s/ from spill?"</i>
Addition	Substitution	
Recognizing a new word that is made by adding a phoneme.	Identifying a new word that is created when one phoneme is substituted for another.	
<i>"What word do you have if you add /b/ to rain?"</i>	<i>"The word is ran. Change the 'r' to 'm.' What is the new word?"</i>	



Photo courtesy of Sound Beginnings/Utah State University

Another challenge with decoding is the fact that in the English language there is not a perfect match for all letters and sounds. There are only 26 letters in the alphabet but approximately 40 phonemes, and the sounds are represented in numerous spellings. For example, the letter “g” can be produced as /g/ in the word *goat*, or /j/ as in the word *giraffe*. The /f/ sound can be spelled with the letter *f*, as in *fan*, or with the digraph *ph*, as in *phone*. Vowel teams, digraphs, and diphthongs add a layer of complexity to decoding. For example, the long /o/ sound can be spelled using *oa* as in *boat*, *ow* as in *low*, *ough* as in *though*, with a silent *e* at the end of a word as in *rope*, or even in isolation at the end of a word as in *no*. Similarly, words with irregular spellings, such as silent letters (*comb* or *knight*), can further complicate learning. Using affixes

to change verb tense or meaning, such as changing *jump* to *jumping*, presents still another layer of complexity. The systematic and explicit teaching of spelling patterns and rules can advance decoding and encoding (writing) skills. Ongoing practice will result in automaticity and fluency.

Children with hearing loss will require extensive experience and instruction training in learning to listen coupled with systematic training to develop phonological and phonemic awareness skills. One must not assume that just because particular children wear hearing devices that they can decode and understand words. “Hearing technology in and of itself will not provide access to the sounds of words. Children must have extensive, systematic, and comprehensive instruction in learning to listen”

(Easterbooks & Estes, 2007, p. 110). In the past, auditory training focused on the development of listening skills with consistent use of amplification and speech reading. LSL therapy is a refinement that focuses on the development of listening skills with no emphasis on visual cues. The goal is to provide intensive auditory stimulation and to scaffold learning from awareness of individual sounds to putting words together in a meaningful way. Easterbooks and Estes (2007) emphasize that teachers need to screen and select both auditory development and phonemic awareness curricula to match the individual needs of students.

Sight Recognition

In numerous cases, word recognition—or “word identification”—must be done on the basis of whole words and/or word units, as many words do not lend themselves to decoding as described above. Many words used in English come from languages other than English, as well as from old forms of written English [e.g., words such as *esprit de corps* (French origin) and *sign* (Middle English, French, and Latin origins)] and are pronounced in ways that must be learned by sight rather than decoding. To be sure, both offer alphabetic clues to their pronunciations. And those clues can help a reader come to some approximation in going from text to speaking, so it can be observed that decoding and sight word reading interact with one another.

Learning all of the ways sounds, patterns, word parts, and whole words are represented when written requires a great deal of experience with listening and pronouncing spoken words, comprehending them, and matching them up with their written counterparts. In some words, the sounds of particular letters depend upon where they fall in relation to other letters. Think of how the combination of “o” and “u” (“ou”) is pronounced in *bough*, *rough*, and *though*, and think about how words such as *save* and *have* look as though they will rhyme according to the usual decoding instruction but do not. Some words spelled in the same ways are pronounced differently depending on their meanings and the words around them (e.g., “I like to *read*, so I have *read* many books”). Such instances in which the decoding rules do not apply must simply be learned,

so the words and their meanings can be recognized quickly. Clearly word recognition is not done in isolation when meaning-making is the goal but in context. It is easier to master the vast number of “sight” words when one has a large and flexible listening and speaking vocabulary for which meanings are readily available.

Making Literacy Development a Reality

Teachers and therapists have important work to do with children and their parents and need to focus on the goals of building independence, collaboration, self-monitoring, and self-worth throughout the individual’s life. While these goals may not seem to apply to the acquisition of literacy, when they are absent, literacy processes are less likely to flourish.

Independence equips the learner to seek more information, ask questions, and believe that she is capable of making sense of sound, symbols, words, and ideas. Being able to collaborate helps the learner trust the professional and work with others to learn more. Self-monitoring ranges from learning to listen to and evaluate one’s own articulation, to checking in on one’s language use in speaking and writing (e.g., have I chosen the right word and put it in the best place?), to evaluating the meaning one is making while listening and reading. Self-worth is necessary, so that the learner feels it is possible for him or her to make progress in learning.

Teachers and therapists have important work to do with children and their parents and need to focus on the goals of building independence, collaboration, self-monitoring, and self-worth throughout the individual’s life.

In this section, we address how to help learners of different ages grow in knowledge and process abilities.

Early Literacy Development

As discussed previously, language development and literacy development are intertwined. Literacy development for the child with typical hearing begins at birth when he is exposed to spoken language, and for the child with hearing loss, the beginning is the exposure to and interaction with usable spoken language. This initial exposure broadens over time to include interactions with

print, which in turn becomes more refined reading and writing skill as the child matures.

Two of the most important experiences adults need to initiate with children both with and without hearing loss to promote their later literacy achievement are frequent shared readings and the use of Language Experience Books. It is never too soon to read aloud to and with an infant, and it has long been documented that children who engage in frequent shared reading become readers more easily than children who do not have this experience. Many researchers assert this.

Language Experience Books (LEBs) are homemade books based upon the child’s experiences (Robertson, 2014, pp. 189-214). The progression from the adult creating the book and its language, to a sharing of its composition, and finally to the child’s being able to take on the writing of his or her own language makes excellent use of the natural progression of language development in all of the ways we discussed in this chapter. Each book becomes a “reading” book for the child that has the advantage of being precisely within the child’s actual and linguistic experience as well as his or her interest (see *Table 4*).

The LEB accomplishes many functions simultaneously. It brings the parent and child together in a routine behavior that focuses on the child, it introduces the child to remembering and talking about recent experiences, it builds vocabulary, and it demonstrates how to write and then to read that writing. As the child grows and learns more language, the LEB process grows accordingly, and the parent and child use the

In the words of one (Adams, 1990, p. 86) . . .

“. . . the most important activity for building the knowledge and skills eventually required for reading is that of reading aloud to children. In this, both the sheer amount of and the choice of reading materials seem to make a difference. Greatest progress is had when the vocabulary and syntax of the materials are just ever so slightly above the child’s own level of linguistic maturity.”

Table 4
Essentials First Steps in Using LEBs

1	The parent (or other adult who spends time with the child) says, “We’re going to make a book about you!”	6	The parent and child talk about the experience as much as possible on that occasion.
2	The parent opens the notebook to the first page and draws or pastes a picture related to an experience they have had together.	7	In a day or two, the parent says, “Let’s read your book about you!” They look at the first page, the adult reads it, and they talk about it. Then the adult creates the next page, and they follow the same procedure.
3	The parent talks about the experience with the child using words the child knows. When possible, the adult sprinkles in a few new words so as to expose the child to new words—usually synonyms—related to the picture. The adult waits patiently for the child to speak about the experience and may ask questions to help the child come up with words or a sentence. Very young children may not be able to do this yet, but it is always important to invite the child to speak about the experience and to wait expectantly for the day the child’s spoken language is up to this interaction.	8	As often as possible, the parent adds new pictures and experiences to the LEB, and the pair enjoys using it for read-alouds.
4	The parent writes words and/or sentences about the experience. For example, “Mommy and I went to the park. I liked the swings. I climbed up the slide. Mommy helped me slide down.”	9	As possible, the parent shares the book with the auditory-verbal practitioner, child’s teacher, daycare provider, and/or grandparents, thus acquainting the adults in the child’s life with the child’s experiences and the language being used with the child about them.
5	The parent reads the words out loud, pointing to them as s/he does so.		

LEB as a book to read together frequently and as a place to record the child's experiences:

1	The child can begin to supply the subject and the picture.
2	In addition to pictures, the parent or child may tape or paste to the page a ticket, a postcard, or some other bit of memorabilia that sparks remembering.
3	The parent chooses more complex words and language for the sentences in order to stretch the child's language knowledge.
4	The child can begin to tell the parent what to write on the page.
5	The child can begin to write on the page.
6	Both the parent and child read the sentences and words on the page.
7	The parent and child both initiate conversation about the experience.
8	The child takes charge of the LEB, using it as a notebook for school projects and as a journal for self-reflection.

Other sources helpful in creating a practice of shared reading include Fox (2008), Ozma (2012), and Trelease (2013).

These early reading and writing behaviors include:

- Sharing books with adults.
- Proper book handling.
- Pointing to pictures and words.
- Drawing and scribbling.

Babies and toddlers need to be exposed to board books and interact with simple and bright illustrations or photographs. As a child matures, these books are replaced with more complex illustrations and texts. Board books become simple storybooks. Reading aloud with young children allows opportunities for bonding and teaching. Typically developing children become aware of environmental print and gain letter knowledge. Narrative skills are developed through talking, describing, and storytelling.

Trelease (2006, p. 34) writes . . .

"One-on-one time between adult and child—be it reading or talking or playing—is essential to teaching the concept of books or puppies or flower or water."

School-Age Literacy

Early literacy skills need to become more refined as the child prepares to enter school. When language development is on track, and early literacy skills are well established, a child is more likely to succeed in academic tasks encountered in school. Phonemic awareness and alphabetic awareness skills are honed, and instruction transitions to developing fluency and comprehension strategies, including metacognitive abilities.

Fluency is the ability to read expressively and meaningfully, as well as accurately and with appropriate speed, that allows readers to construct meaning (Rasinski, 2012). When readers are able to identify words with automaticity, more cognitive energy is available for comprehension. Indeed, Rasinski (2012) describes fluency as the bridge from word recognition to text comprehension and suggests wide and repeated reading of authentic texts as a way to improve fluency. A word of caution here is that material used for fluency exercises should contain vocabulary and grammar with which a child is familiar, as fluency is the dynamic interaction linking background knowledge, vocabulary, and word identification.

Just as with promoting early literacy, using predictable stories is beneficial for promoting fluency. These stories usually have natural language patterns, repetitive language, and illustrations that support the text—qualities that help children know what to expect. Poetry and music also have repetitive language and rhythm that can be used to enhance fluency too. Choral reading can provide less-able readers with simultaneous support while reading. Similarly, Readers' Theater offers opportunities for students to participate in drama, prose, or poetry.

Attention to chunking—a cognitive phenomenon (VandenBos, 2007)—is yet

Early literacy skills need to become more refined as the child prepares to enter school.

another useful teaching strategy for improving fluency. Chunking helps students recognize and store in short-term memory words that go together—*out of sight, in the woods, etc.*—or natural breaks in text—*The little bunny / hopped away*. These exercises provide visual models for reading short bits of text while building prosodic skills. Teaching about different types of punctuation informs students of prosodic elements, such as pauses, inflection, intonation, emphasis, and even the meaning of text. Repeated readings of passages provide continued practice and allow students to become familiar with particular texts over a period of time.

Paired readings are where students are grouped in pairs and select different passages to share. Students read passages silently and then to one another. A benefit of paired readings is that partners are not seen as threatening or imposing.

As students grow older and transition from “learning to read” to “reading to learn,” instruction should prepare students to comprehend and respond to text in meaningful ways. This is not to lessen the importance of comprehension strategies in early literacy development, as they should be emphasized at all ages/grades.

The National Reading Panel (2000) recommended six strategies for increasing comprehension. These six strategies increase in complexity moving down a continuum:

1	Monitoring comprehension.
2	Using graphic organizers.
3	Answering questions.
4	Generating questions.
5	Recognizing story structure.
6	Summarizing.

Monitoring comprehension occurs as readers actively think about what they are reading and recognize when they do not understand something—knowing when you know and when you don’t know. They apply

metacognitive (thinking about thinking) strategies to address difficulties.

Armbruster, Lehr, & Osborn (2001, p. 42) note . . .

“For example, using comprehension monitoring, a good reader may clarify the purpose of reading and preview the text, examine his/her understanding, modifying reading speed to correspond to the difficulty of the text and ‘fix up’ evolving comprehension problems during reading, and finally verify his understanding of the text afterward.”

Table 5 lists thinking or metacognitive prompts that might be applied during this monitoring process. Readers might also ask themselves the questions shown.

Table 5 Thinking or Metacognitive Prompts & Possible Questions

Thinking or Metacognitive Prompts	Possible Questions
I’m thinking . . .	Is this making sense?
I’m seeing . . .	What is going on?
I’m wondering . . .	Do I need to reread?
I’m feeling . . .	What does this word mean?
I’m noticing . . .	How is it pronounced?
	What have I learned thus far?
	Should I read further?
	Can I explain what I have read?
	Can I put it in my own words?
	Why is this important?

Graphic and semantic organizers are visual representations (maps, charts, webs, graphs, frames, semantic maps, semantic webs, T-charts, Venn diagrams, K-W-L charts, etc.) of concepts or themes that promote comprehension by emphasizing concepts and relationships between concepts. They are particularly useful for content areas in which there is a great deal

Answering and generating questions are important in furthering comprehension.

of technical detail or complex vocabulary, as in scientific areas. However, they can be used across subjects and content areas. They help organize content, help students make connections, structure thinking, and facilitate writing.

Answering and generating questions are important in furthering comprehension. When the teacher poses questions, students are afforded the opportunity to review what they have read, make inferences, and gauge comprehension. They are also able to learn text structure as they look for answers within the text. Generating questions based on their reading gives students an opportunity to connect with text through higher-level thinking skills and determine importance of what they have read. Answering and generating questions before, during, and after reading leads students to delve into text deeper, thus promoting a clearer understanding.

Recognizing story structure helps students guess about what to expect during reading. For example, students recognize that characters and setting of a story are usually identified at the beginning of a story, a problem occurs midway through reading, and a solution occurs at the end of a story. This structure provides a basis for understanding. Knowing the structure also helps. When students are asked questions, they know where to look for answers. Graphic and semantic organizers help with this.

Summarizing gives students the opportunity to decide what is important in the text, identify main ideas, understand the author's purpose or message, and put the outcomes of such deliberations into their own words. This strategy offers the most support when students are able to

summarize small bits or sections of text. For example, students summarize individual chapters in a novel and then a final summary at the end of such.

Metacognitive skills associated with comprehension and learned during these years include making connections between old and new information, building and activating background knowledge, and visualizing or creating mental images. Comprehension strategies can be taught explicitly across grade levels, especially for struggling readers. Instruction may be more intensive initially and then slowly give way to student independence in a gradual release of responsibility from teacher to student. In teacher modeling, the teacher explains the strategy and demonstrates the skill. Guided practice provides opportunities for students to try out a specific strategy with guidance and feedback from the teacher. Independent practice occurs when the students practice independently, and finally application occurs when students can use a newly learned strategy on their own with new reading material. Such scaffolding allows students to learn new strategies and grow in confidence.

For children who are deaf, Williams (2012) recommends that a balanced literacy approach is used to promote reading skills, and that teachers must critically evaluate all reading materials. Such an approach reflects a continuum of practices with varying levels of support—reading to students, reading with students, and students finally adding independent reading. This approach is similar to the suggested teaching of comprehension strategies mentioned in the above paragraph in that students become more accountable as their skills increase.

Reading **to** students (Read Aloud) stimulates interest, provides a good role model, and exposes them to multiple genres. Reading **with** students (Shared Reading, Language Experience Approach, Guided Reading) increases their involvement, and the teacher helps them make connections and implements instruction for specific strategies. Independent reading gives students the opportunity to apply learned strategies and skills. Similarly, Schirmer (2000) promotes a balanced literacy in which reading and writing are interrelated and the reading behaviors of readers guides instruction (formative teaching),

Comprehension strategies can be taught explicitly across grade levels, especially for struggling readers.



Photo courtesy of Sound Beginnings/Utah State University

students are given choice and ownership in selecting reading materials, and they become metacognitive readers. Practice in reading a large number and wide variety of books is probably the most important developer of high levels of literacy. *The Book Whisperer* is an important book by a sixth-grade teacher who has turned many nonreaders into readers by encouraging them to read widely and often, and we recommend it as an excellent resource (Miller, 2009).

Literacy Across the Curriculum

The shift from learning-to-read to reading-to-learn in third or fourth grade suggests the need for proficiency in foundational skills, such as reading and language use. Often teachers assume unrealistically that all students—both those with typical hearing and those with hearing loss—bring prerequisite skills to the classroom. Teachers need to be especially aware that many learners who are D/HH come to them less ready to make the jump, particularly into reading in the content areas and making sense of more demanding types of literature (Evans & Clark, 2015). As such, educators are charged with the task of minimizing educational gaps while recognizing that students who are D/HH have a variety of language histories, learning needs, and communication preferences (Dostal et al., 2017). Addressing these educational gaps may require that instruction is modified or augmented to support individual learner needs and facilitate growth, particularly in content areas where text becomes increasingly complex and less concrete. Many learning activities and tasks require abstract reasoning and other higher-level critical thinking skills, and students need explicit and systematic instruction. Learning about text structure and print features (e.g., boldface type, use of italics, headings, graphs, tables, figures, photographs, and captions) characteristic of these texts can prepare learners to engage with reading materials in the content areas.

Instructional strategies that generalize across all content areas and optimize learning for learners who are deaf include:

- Robust discussions.
- Repeating or restating questions and comments to fill in gaps for students.
- Rephrasing, as needed.
- Asking open-ended questions.

Students need help in making personal connections with text, making predictions and inferences, and learning to confirm or rule out those predictions and inferences. Other instructional strategies include:

- Presenting materials in multiple modes.
- Using visuals, digital, and multimedia or multisensory formats.
- Explicitly teaching background knowledge.
- Using graphic and semantic organizers.
- The pre-teaching of targeted vocabulary that provides links to previous knowledge (context).
- Cooperative learning activities.
- Summarizing material.
- Using leveled texts.
- Using captioning and other assistive technology.
- Encouraging independent reading.

A designated notetaker, providing additional processing time, and extended time for completing assignments and tests may also facilitate learning.

Content-Specific Strategies

The subject of math can prove especially difficult. Problem solving and computational skills are often dependent on reading and language competency of spatial relationships and quantitative reasoning. Unique symbols, numbers, and alphabetical characters represent abstract concepts, as well as vocabulary and text structure that differ from everyday language (Ming, 2012). The linguistic demands for word problems can be difficult for a learner who is D/HH. Using manipulatives; drawing pictures, charts, or diagrams; modeling think-alouds; and the scaffolding of tasks can promote understanding and independent thinking. Additionally, instruction can be augmented with expressive writing activities whose goal is to describe concepts. Collaborative learning can promote academic success while providing good interpersonal communication experiences.

Practice in reading a large number and wide variety of books is probably the most important developer of high levels of literacy.

Although science is experiential in nature, it presents its own set of challenges due to its complex technical and procedural vocabulary, as well as requisite critical-thinking skills. Students of all ages can find the words hard to read, write, and spell. Therefore, the concepts and associated vocabulary are best explored and supported by offering pre-teaching, explicit teaching, and post-teaching through semantic mapping, charts, diagrams, and other graphic or visual organizers. Cooperative learning and hands-on activities can enhance success with content material, as can using trade books or leveled texts.

Equally demanding, social studies and geography contain specialized and often abstract vocabulary or concepts that may necessitate pre-teaching and explicit teaching. Teaching that emphasizes text structures and print features can support learning, and including cooperative learning activities, role-playing, and community service opportunities as often as practical are appropriate hands-on learning experiences. As with other content areas, the use of graphic and visual organizers, maps, and manipulatives helps all learners.

Other important components of the general education curricula that should not be overlooked include art and music. Indeed, art instruction provides opportunities for children to hone fine motor skills through drawing, painting, cutting, sculpting, etc., as well as developing creativity and imagination. Likewise, participation in music education through vocal/choral engagement or by learning to play an instrument can provide many learning opportunities. As is the case for typically hearing learners, the ability to read music promotes literacy skills, as well as speaking and listening skills. An extensive study of D/HH learners who participated in music instruction showed increases in auditory working memory, sound perception and discrimination, recognition of pitch, prosody and rhythm patterns, as well as increased phonological awareness (Torppa & Huutilainen, 2019).

Irrespective of content, it is critical that educators attend to characteristics of the physical classroom to ensure an optimal learning environment for students with hearing loss. This includes minimizing background noise, providing visual access, and the scaffolding of learning tasks, as well as employing instructional strategies discussed herein. Good attention should be given to assistive technology devices and services that enhance the physical environment, including:

Classroom amplification or remote microphones.

Captioning and transcripts of audio and video information.

Peer notetakers.

Frequent comprehension checks.

Allowing one speaker at a time, when possible.

Facing the child with hearing loss.

The Question of a Reading Curriculum

We have both, on occasion, been asked to suggest a curriculum that teaches children to read and write, and we understand the desire to have in hand the “perfect,” “foolproof” roadmap to literacy. This does not and cannot exist. Children do not progress in a lockstep, entirely predictable fashion. Many fine curricula exist, however, and teachers and therapists need to learn as much as possible about theories of language acquisition, reading, writing, and thinking in order to evaluate and make wise choices when consulting one or more of them. Using the Listening and Spoken Language domains and guidelines allows for the professional to decide upon content that is accessible to the child and compatible with the family’s interests. The goal of auditory-verbal intervention is to prepare the child to enter mainstream schooling with the age-appropriate receptive and expressive language that readies him/her to participate in whatever approach is in use in that school.

Children do not progress in a lockstep, entirely predictable fashion.

The question of a reading curriculum in some minds involves thinking about a phonics approach versus a sight word approach, as though they are in opposition with each other. It is more useful to regard phonics and sight words as two necessary approaches to word identification, as neither one “solves” all words. As discussed earlier in this chapter, comprehension is the purpose for reading, and creating comprehensible text is the purpose for writing. Both guide and are guided by the written symbols and language structures in complex interactions that involve prior knowledge and the content at hand.

College & Beyond

Even when students arrive at college and the world of work with well-developed LSL comprehension, skills, and strategies, they need the understanding, support, and assistance of those around them—professors, fellow students, employers, colleagues, and support staff. It is not uncommon for a student to enroll in college or begin a new job with the intention of not mentioning the hearing loss and proceeding “just like everyone else.” While this strategy may work for some, most find that it is necessary for others to understand their situation, as there are times when spoken words are inaccessible. Technology can break down, batteries can go dead, there may only be one seat left in the back of a large room where no microphone is being used, and so on.

Students and employees need to speak for themselves with the people who need to understand. The first point of contact can be the Americans with Disabilities Acts (ADA) coordinator or the human resources department. Students should initiate a conversation with the ADA coordinator and with professors at the beginning of every course in which they describe how they hear and listen and give information about seating needs and preferences during classes. The ADA coordinator is charged with assisting the student with gaining appropriate accommodations. New employees need to talk with supervisors and colleagues about how best to get their attention and make sure they’ve received and had a chance to digest communicated information. None of this need be intrusive—though legal recourse is available and sometimes necessary. In fact, professors and employers need to think about these matters in the case of all students and employees—both with and without hearing loss.

College students are expected to become increasingly independent during this phase of their education. Students with hearing loss who have been coached and expected to speak up for themselves throughout their education will have an easier time than those who have been kept dependent by parents and teachers.

Even when students arrive at college and the world of work with well-developed LSL comprehension, skills, and strategies, they need the understanding, support, and assistance of those around them.

Academic learning during the college years takes place in numerous venues. Students need to have considerable, extensive facility with spoken language as they attend lectures, participate in discussions, prepare and give reports, write lengthy pieces, and study for and take exams. Hands-on laboratory and fieldwork demand written and spoken responses and analyses. One learning task is to identify, transfer, and transform the language of lectures, readings, and discussions into one’s own spoken and written words, as the language a student encounters helps the student ask questions about content. Various sources of language and ideas can bolster each other as students become aware in their reading of words they have encountered in listening to a lecture, and words heard in lectures and discussions are discovered in readings. Learning demands continuously ratchet up, as it is increasingly not enough to listen, read, and remember. Students now have to remember, comprehend, apply, analyze, synthesize, and evaluate (Bloom et al., 1956).

Perhaps surprisingly, learning becomes more social, and the need for a network of fellow students, faculty, and advisors becomes apparent. The expectation that individuals become part of learning, research, and working groups intensifies, and cooperative and collaborative learning are prominent in many courses.

In order to prepare for the demands of not only “knowing” but of carrying out the more complex levels of dealing with and creating new knowledge, students can benefit from engaging in “how to study in college” advice that includes strategic reading, note-taking, rehearsing, and concept mapping (see *Table 6*). These four strategies are just a few of the many offered for college students. In fact, many college and university websites supply good advice about studying and learning for students.

College professors often require their students to explain a concept—verbally and/or in writing—in order to discover what they know and do not know. Then they use this knowledge to fill in gaps they see in students’ thinking. They address faulty explanations by asking

Table 6
 “How to Study in College” Advice

Strategic Reading	Note-Taking
<p>Strategic reading involves preparing for reading course materials instead of just starting on the first page. The <i>Three Ps for Effective Reading</i> (http://lsc.cornell.edu/wp-content/uploads/2016/08/Three-Ps-for-Effective-Reading-.pdf) involve establishing a purpose for reading by looking at the assignment and thinking about where it fits into the course, previewing the material by looking at chapter titles and section headings and thinking about the meanings of the words used, and making a plan according to what one needs to be able to do as a result of doing the reading.</p> <p>Underlining important information during reading is good practice, but it is not sufficient. The student can add notes in the margin that organize the ideas and/or take notes in a notebook based on the underlined material while seeking not only to remember but to organize and translate the ideas into his/her own words.</p>	<p>Note-taking can be done in a system known as Cornell Notes (e.g., http://lsc.cornell.edu/study-skills/cornell-note-taking-system/, http://lsc.cornell.edu/study-skills/cornell-note-taking-system/). In this system, the student creates a 2- to 3-inch margin on the left side of the note-taking paper, a broad main area on the page, and a 2- to 3-inch footer at the bottom of the page. The broad area is used for notes and drawings, the left-hand margin is used for key points and consolidating labels, and the footer is used for general conclusions. This mode of note-taking enables the student to impose order on the material—thus preparing it in advance for studying and being able to do something with the material in other settings, including examinations.</p>
Rehearsing	Concept Mapping
<p>Rehearsing is a way of practicing the retrieval from memory of particular words and ideas. It is particularly helpful to students with hearing loss, because it involves saying and/or writing a list of words, a memorable passage from a book, a series of causes and effects, and so on.</p>	<p>Concept mapping helps a student connect and thereby remember related information. It is accomplished by creating a drawing or map of the relationships (http://lsc.cornell.edu/wp-content/uploads/2015/10/Concept-Mapping.pdf). Creating the map itself is an exercise in understanding how the parts of a concept, historical event, or process relate to each other, and the resulting map becomes part of the student’s study materials to use in preparation for an examination and other uses for the information. Concept mapping can help a student see where s/he understands and does not understand.</p>

probing questions and involving students in carrying out specific processes. They direct students to library faculty who provide instruction in how to find and use texts, such as reference books and online sources. They help students understand learning as teasing out and making conventional and fresh connections.

College students must be encouraged and shown how to control their academic and social lives. They need advisors who welcome them, so that they seek meetings with them. If an assigned advisor is not a good fit for the student, the student needs to be encouraged to find an advisor with whom he feels comfortable. It must be stressed that students not attempt to do everything on their own. This advice is for all students with and without hearing loss.

Students need reminders, and they need to learn to create their own systems of reminding themselves about what they need to do and when they need to do

it. A major part of becoming independent during the college years involves taking on one's own scheduling responsibilities. Students also need to learn to monitor their own progress, so that they can recognize when and where they are succeeding and doing less well.

The skills associated with independence in college extend to the workplace and can be learned in the workplace whether the employee has been a college student or not.

Literacy skills are among the most important skills that a child must learn. Certainly such proficiency has a profound impact on one's academic and vocational future.

Individuals with hearing loss who learn to listen and speak have the advantage and capability of operating in the world in the same independent and collaborative ways that people with typical hearing do.

Conclusion

Literacy skills are among the most important skills that a child must learn. Certainly such proficiency has a profound impact on one's academic and vocational future. It is critical that literacy instruction be meaningful, effective, and grounded in the best literacy theory and teaching practices. Parents, teachers, and other professionals must work together with the child in mind to ensure delivery of quality literacy instruction. Children who are deaf can become proficient readers and skilled writers when provided with high-quality interactions with teachers and other literate people in the context of instruction tailored to meet individual needs.



Photo courtesy of Sound Beginnings/Utah State University

References

- Adams, M. (2002). Alphabetic anxiety and explicit, systematic phonics instruction: A cognitive science perspective. In S. Neuman & D. Dickinson (Eds.), *Handbook of early literacy research* (pp. 66-80). New York: Guilford Press.
- Anderson, R. (2004). Role of the reader's schema in comprehension, learning, and memory. In R. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 594-606). Newark, DE: International Reading Association.
- Armbruster, B. B., Lehr, F., & Osborn, J. (2001). *Put reading first: The research building blocks for teaching children to read: Kindergarten through grade 3*. Jessup, MD: National Institute for Literacy.
- Beck, I. L., McKeown, M. G., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary instruction*. NY: Guilford Press.
- Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, O. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: The cognitive domain*. New York: Longman.
- Buehl, D. (2013). *Classroom strategies for interactive learning* (4th ed). ILA.
- Clay, M. M. (2000). *Concepts about print: what have children learned about printed language?* Portsmouth, NH: Heinemann.
- Concept mapping. Retrieved January 18, 2017, from <http://lsc.cornell.edu/wpcontent/uploads/2015/10/Concept-Mapping.pdf>.
- Cornell Note-Taking System. Retrieved January 18, 2017, from <http://lsc.cornell.edu/study-skills/cornell-note-taking-system/>.
- Dostal, H., Gabriel, R., & Weir, J. (2017). Supporting the literacy development of students who are deaf/hard of hearing in inclusive classrooms. *The Reading Teacher*, 71(3), 327-334.
- Duke, N., & Purcell-Gates, V. (2003). Genres at home and at school: Bridging the known to the new. *The Reading Teacher*, 57(1), 30-37.
- Easterbrooks, S. R., & Estes, E. (2007). *Helping deaf and hard of hearing students to use spoken language*. Thousand Oaks, CA: Corwin Press.
- Estabrooks, W. (Ed.). (2012). *101 FAQs about auditory-verbal practice*. Washington, DC: Alexander Graham Bell Association for the Deaf and Hard of Hearing.
- Estabrooks, W., Maciver-Lux, K., & Rhoades, E. (Eds.) (2016). *Auditory-verbal therapy for young children with hearing loss and their families, and the practitioners who guide them*. San Diego: Plural Publishing.
- Evans, M. B., & Clark, S. K. (2015). Finding a place for CCSS literacy skills in the middle school social studies curriculum. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 88(1), 1-8.
- Fox, M. (2008). *Reading magic*. Orlando: Houghton Mifflin Harcourt.
- Frey, D., Frederick, W. C., & Klausmeier, H. J. (1969). *A schema for testing the level of cognitive mastery*. Madison, WI: Wisconsin Center for Educational Research.
- Fry, D. (1966). The development of the phonological system in the normal and the deaf child. In F. Smith & G. Miller (Eds.), *The genesis of language: A psycholinguistic approach* (pp. 187-206). Cambridge, MA: MIT Press.
- How to Take Cornell Notes. Retrieved January 18, 2017, from <http://lsc.cornell.edu/study-skills/cornell-note-taking-system/>.
- Johns, J. L., & Lenski, S. D. (2010). *Improving reading: Interventions, strategies, and resources* (5th ed.). Dubuque, IA: Kendall-Hunt.
- Joint Committee on Infant Hearing. (2007). Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. *Pediatrics*, 102(4), 893-921.
- Kamil, M. L. (2004). Vocabulary and comprehension instruction: Summary and implications of the National Reading Panel findings. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research*. Baltimore, MD: Paul H. Brookes
- Madell, J. (2015). *It's not the same old deafness*. Retrieved March 30, 2017, from <http://hearinghealthmatters.org/hearingandkids/2015/its-not-the-same-old-deafness-2/>.
- Marschark, M., & Hauser, P. C. (2012). *How deaf children learn: What parents and teachers need to know*.
- Miller, D. (2009). *The book whisperer: Awakening the inner reader in every child*. San Francisco, CA: John Wiley & Sons, Inc.

- Ming, K. (2012). 10 content-area literacy strategies for art, mathematics, music, and physical education. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 85(6), 213-220.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: National Institute of Child Health and Human Development.
- Ozma, A. (2012). *The reading promise*. New York: Grand Central Publishing.
- Rasinski, T. V. (2012). Why reading fluency should be hot! *The Reading Teacher*, 65(8), 516-522.
- Robertson, L. (2014). *Literacy and deafness*. San Diego: Plural Publishing.
- Rosenblatt, L. (1978). *The reader, the text, the poem: The transactional theory of the literary work*. Carbondale, IL: Southern Illinois University Press.
- Ruddell, R., & Ruddell, M. (1994). Language acquisition and literacy processes. In R. Ruddell, M. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 83-103). Newark, DE: International Reading Association.
- Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97-110). New York: Guilford Press.
- Schirmer, B. R. (2000). *Language and literacy development in children who are deaf*. Needham Heights, MA: Allyn and Bacon.
- Snow, C. E., Griffin, P., & Burns, M. S. (2005). *Knowledge to support the teaching of reading: Preparing teachers for a changing world*. San Francisco, CA: John Wiley & Sons.
- Three Ps for effective reading. Retrieved January 18, 2017, from <http://lsc.cornell.edu/wp-content/uploads/2016/08/Three-Ps-for-Effective-Reading-.pdf>.
- Torppa, R., & Huotilainen, M. (2019). Why and how music can be used to rehabilitate and develop speech and language skills in hearing-impaired children. *Hearing Research*.
- Trelease, J. (1995). *The read-aloud handbook* (4th ed.). New York: Penguin.
- Trelease, J. (2006). *The read-aloud handbook* (6th ed.). New York: Penguin.
- Trelease, J. (2013). *The read-aloud handbook* (7th ed.). New York: Penguin.
- Trezek, B. J., Wang, Y., & Paul, P. V. (2010). *Reading and deafness: Theory, research, and practice*. New York: Clifton.
- Vacca, J. L., Vacca, R. T., Gove, M. K., Burkey, L. C., Lenhart, L. A., & McKeon, C. A. (2010). *Reading and learning to read* (9th ed.). Boston: Pearson.
- Vacca, R., & Vacca, J. (2002). *Content area reading: Literacy and learning across the curriculum*. Boston: Allyn and Bacon.
- VandenBos, G. R. (Ed.). (2007). APA dictionary of psychology. *American Psychological Association*. Retrieved May 18, 2020, from <https://dictionary.apa.org/chunking>
- Williams, C. B. (2012). *Starting points: Preparing deaf and hard of hearing students for literacy success*. Hillsboro, OR: Butte Publications.
- Yopp, R., & Yopp, H. (2010). *Literature-based reading activities* (5th ed.). Boston: Pearson.

