

2019

THE RESEARCH BEHIND
LEARNING A-Z:

How Best Practices Inform Award-Winning Products



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Overview

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Differentiated reading instruction can no longer be seen as an intervention or as a remedial measure; it is the way to teach all students (Ivey, 2000, p. 42).

Learning A–Z knows that having high-performing teachers is the single best predictor of student success (Wright, Horn, & Sanders, 1997, p. 63). Accordingly, we have developed products that make it easier for teachers to provide the differentiated instruction every student needs. Learning A–Z has designed a suite of online reading resources delivered by its family of websites. This comprehensive collection of learning resources are created to mirror best practices as defined by years of classroom research and as described in the National Reading Panel’s report (National Institute of Child Health and Human Development, 2000).

This document illustrates how Learning A–Z products align with best practices culled from a vast range of research in the teaching of reading, writing, vocabulary, science, and language learning. The first three chapters review research related to teaching reading, the necessity of guiding students in reading to learn, and the significance of 21st century literacy skills. The fourth chapter focuses on research about best practices to teach writing, and the fifth chapter addresses research recommendations when teaching science. The last two chapters address the needs of specific demographic groups such as English language learners and exceptional learners. Each chapter includes recommendations for Learning A–Z products that are informed by research in the chapter’s topic area.

We believe that this document not only demonstrates our dedication to research-based best practices in teaching, but also provides a starting point for exploring how certain instructional strategies impact a range of learners, from gifted and advanced students to English language learners and special needs students. Learning A–Z’s leveled resources are ideal for differentiating instruction in a variety of subjects, and this paper highlights the spectrum of studies that inform the development of our products.

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Teaching the Foundations: Best Practices for Emergent Readers

Teaching the Foundations: Best Practices for Emergent Readers

Introduction

According to the United States Department of Education (2002), instructional programs and materials used by a state educational agency or school district must focus on the five key areas that scientifically based reading research has identified as essential components of reading instruction: phonics, phonemic awareness, fluency, vocabulary, and reading comprehension. Two other critical foundational skills—alphabetic knowledge and high-frequency words—have been identified by Adams (1990) and Fry, Kress, and Fountoukidis (2000). Together, these seven key areas are critical for students to master so they can read to learn or read for pleasure. Learning A–Z’s reading resources are informed by the best practices identified in research on teaching foundational skills. Our resources guide students in building and practicing these foundational skills so they are prepared for more advanced skills as they advance through grade levels.

I. Alphabetic Knowledge

Alphabet instruction involves teaching naming, recognition, and formation of the 26 uppercase and lowercase letter symbols in the English language. Letter recognition is one of the strongest predictors of early reading success (Adams, 1990; Schatschneider, Fletcher, Francis, Carson, & Foorman, 2004). Research on alphabetic knowledge, including knowledge of letter names and sounds, has shown strong positive correlations with later decoding, reading comprehension, and spelling skills (Hammill, 2004; National Early Literacy Panel, 2008; Shanahan & Lonigan, 2010). Although research investigating causal relations between alphabetic knowledge and other early literacy skills has been inconclusive, studies on letter naming instruction have shown a small but significant impact on knowledge of letter sounds (Piasta & Wagner, 2010).

Instruction and practice are especially important for students who do not enter preschool or kindergarten with fluent letter recognition skills. Research has found that using letter/keyword/picture displays when introducing letters and that incorporating writing or printing into letter instruction are effective ways to help students develop letter recognition (Adams, 1990). In addition, research supports frequent, targeted practice of letter names and sounds (Jones & Reutzel, 2012; Reutzel, 2015) and has shown that instruction in letter names and sounds may be enhanced when combined with phonological instruction (National Early Literacy Panel, 2008; Piasta & Wagner, 2010).

Learning A–Z Resources that Support Instruction in Alphabetic Knowledge

Raz-Plus and Reading A–Z

- **Alphabet Books** introduce each letter of the alphabet in uppercase and lowercase and pair the letter with names and pictures of objects that begin with that letter.
- **Alphabet Flashcards** support practice in fluently naming and recognizing letters.
- **Alphabet Chants** are alliterative rhymes that highlight words beginning with a letter of the alphabet.
- **Letter Formation Practice Sheets** are ruled practice sheets for each letter of the alphabet that provide practice in uppercase and lowercase letter formation.
- **Alphabet Letter Naming Assessments** evaluate recognition of uppercase and lowercase letters.

II. Phonological Awareness

Phonological awareness focuses on the sounds of language rather than the symbols that represent sounds. Instruction in phonological awareness includes awareness of sound at the word, rhyme, syllable, and phoneme levels. It is one of the most important, if not the most important, early predictors of reading success (Schatschneider et al., 2004; Stanovich, 1996).

In particular, studies have shown that phonemic awareness—an aspect of phonological awareness that involves awareness and manipulation of phonemes—is one of the best predictors of how well children will learn to read and is an important component of early reading instruction (Melby-Lervåg, Lyster, & Hulme, 2012). A meta-analysis of 52 published studies found that instruction in phonemic awareness had a significant effect on both reading and spelling (Erhi et al., 2001; National Institute of Child Health and Human Development, 2000). This effect remains over time: studies on the long-term impacts of instruction in early reading skills have shown that instruction in phonemic awareness has long-term positive effects on prereading, reading, comprehension, and spelling skills (Suggate, 2016).

Effective teaching strategies for phonemic awareness include teaching students to identify a particular sound in a word; recognize the same sound in different words; recognize one word that begins or ends with a different sound from a group of three or four words; segment and blend the sounds in a word; and manipulate sounds in a word through substitution, addition, and deletion (NICHD, 2000).

Phonemic Awareness Skills for Effective Reading Instruction	
Skill	Definition
Isolation	recognizing individual phonemes in words
Identification	recognizing the same phoneme in multiple words
Categorization	identifying a word with odd (different) phonemes in three- to four-word sequences
Blending	listening to a sequence of separated phonemes and blending them together to form a word
Segmentation	breaking words into phonemes
Manipulation	adding, deleting, or substituting phonemes to create new words

Learning A–Z Resources that Support Phonological Awareness

Raz-Plus and Reading A–Z

- **Phonological Awareness Lessons** teach students to notice, differentiate, think about, and manipulate sounds and provide explicit instruction on word awareness, onset and rime awareness, rhyme awareness, syllable awareness, and phonemic awareness. In these lessons, students:
 - Identify and produce rhyme
 - Blend and segment syllables and onset and rime
 - Discriminate initial, final, and medial sounds
 - Blend and segment phonemes
 - Manipulate initial, final, and medial sounds
- **Read-Aloud Books** target specific sounds and build critical phonemic awareness skills. Alliteration with consonants or repetition of vowel sounds in each book provides opportunities for students to demonstrate listening for particular phonemes in the initial, medial, and final positions of words.

- **Phonological Awareness Assessments** can be used to evaluate students’ onset and rime, rhyme, syllable, and phonemic awareness skills. Phonemic awareness assessments include identifying initial, final and medial sounds in words as well as blending, segmenting, and manipulating phonemes.

Headsprout

- **Headsprout Early Reading** consists of 80 online lessons where students put sounds together, hear sounds slowly blended, say sounds slowly blended, hear the sounds said quickly together as whole words, and eventually say the words quickly themselves. Students learn that words can begin or end with the same sound and that words can be broken down into onsets and rimes. Students discover that some sounds can have other sounds inside them and that sound units can be combined to make new sounds. Students also segment single and multi-syllable real and nonsense words into separate sounds and blend multiple sounds to make real and nonsense words.

III. Phonics

Phonics is a natural follow-up to phonemic awareness instruction. Teaching children the graphemes (letters) associated with the phonemes (sound units) that they have learned enables children to decode printed words. The most effective instruction quickly moves students from awareness of a particular sound to an association of that sound with a letter symbol. When letter symbols are introduced, students can manipulate the sounds within words by using their knowledge of sound/symbol relations.

From a meta-analysis of 38 studies on reading, the National Reading Panel concluded that, as measured by students’ ability to read words, systematic phonics instruction was more effective than other approaches to teaching reading. Phonics instruction also had a positive impact on students’ reading comprehension and spelling and was most effective when begun early—in kindergarten and first grade (NICHD, 2000; Stuebing, Barth, Cirino, Francis, & Fletcher, 2008). A later meta-analysis also found positive effects of phonics instruction on prereading, reading, comprehension, and spelling skills (Suggate, 2016).

Learning A–Z Resources that Support Phonics Instruction

Raz-Plus and Reading A–Z

- **Decodable Books and Phonics Lessons** are systematically organized phonics lessons that provide direct and explicit instruction in sounds and their corresponding symbols with practice in blending, segmenting and word manipulation. Each phonics lesson is built on research-based strategies for introducing, teaching, and practicing a sound (phoneme) and its related symbol or symbols (graphemes). Lessons include activities using manipulatives, such as letter cards, phonogram cards, work mats, decodable and high-frequency word cards, games, and worksheets that support instruction and practice with skills such as phonemic awareness, sound/symbol relationships, writing and spelling, blending and segmenting, decoding, word families, and high-frequency words.

Designed to support the Orton-Gillingham approach to reading instruction, the Decodable Passages Packs emphasize systematic, sequential, multisensory, synthetic, and phonics-based instruction. The short passages with decodable words and various activities pair with supplementary, multisensory lessons, to provide multiple pathways for students to understand the sound/symbol relations as well as the “how” and “why” behind reading.

- **Sound/Symbol Books**, featuring simple pictures with labels, can be used to practice the sound/symbol relations introduced in phonics lessons. In Sound/Symbol Books, the target letter-sound combination might be shown in the initial, medial, or final position within words, and sometimes in more than one position for a particular letter-sound relation.

- **Phonics Assessments** include two types of assessments: the first type measures students' ability to associate a sound with a given symbol, and the second type measures students' ability to decode nonsense words.

Headsprout

- **Headsprout Early Reading** teaches sound-letter correspondence, segmenting, and blending through 80 online lessons. Students learn 94 carefully chosen phonetic elements to maximize their decoding repertoire. The sounds taught in early parts of the program are those that maintain a consistent pronunciation in over 85% of the words in which they appear, and thus maximize students' early success in sounding out words. Students read single- and multi-syllable words with common short and long vowel spelling patterns and words from common word families. Students also practice reading entire stories while decoding novel words in context.

Research on Headsprout Early Reading has shown that students who complete the program make gains on standardized tests compared to control groups, including the Diagnostic Reading Analysis (DRA) and Word Recognition and Phonic Skills (Tyler, Hughes, Beverley, & Hastings, 2015); the Woodcock-Johnson III-R Letter-Word Identification subtest and the Iowa Test of Basic Skills (ITBS) Word Analysis and Reading Words subtests (Twyman, Layng, & Layng, 2011); DIBELS Nonsense Word Fluency and Nonsense Word Reading subtests (Watkins et al., 2016) and DIBELS Phonemic Segmentation and Nonsense Word Fluency subtests (Clarfield, 2006).

IV. High-Frequency Words

High-frequency words are those that occur often in text. Frequent, cumulative exposure to these words leads to decreases in the time it takes to read them, and this difference has been shown in readers as young as eight years old (Joseph, Nation, & Liversedge, 2013). Mastering a repertoire of high-frequency words accelerates fluent and meaningful reading and helps students learn other words that contain similar parts (Fry et al., 2000; Pikulski & Chard, 2005).

Many words that occur frequently in written language cannot be sounded out because they are phonetically irregular (e.g., *the*, *have*). However, most still contain regularities in their letter-sound relations, and these regularities can be utilized in learning these words—for example, as when most letters in a word have regular letter-sound relationships with one or two exceptions, or when a pattern of letters has the same sound such as in *could*, *would*, and *should* (Ehri, 1995; Pikulski & Chard, 2005).

Learning A–Z Resources that Support Learning High-Frequency Words

Raz-Plus and Reading A–Z

- **High-Frequency Word Books** include the most commonly used sight words in printed texts.
- **Most Common Words Flashcards** include 220 of the most commonly used words, including sight words.
- **High-Frequency Words Assessments** help measure a student's ability to recognize and read high-frequency words.

Vocabulary A–Z

- **Sight Word Lists** include Dolch Sight Word Lists, Fry's 1,000 Most Frequently Used Words List, High-Frequency Words, Marzano Words Lists, and Spache Words Lists. These lists can be used to create custom lessons and practice materials directly from the website.

Headsprout

- **Headsprout Early Reading** teaches many common sight words, including *the, said, could, would, should, are, does*, and more. As students advance through the program, they practice recognizing and fluently reading high frequency sight words. In addition, Headsprout teaches students a strategy called “ballparking” to help them read words that are slightly irregular, such as *work*. In ballparking, students use the letter-sound relationships they have learned to sound out the slightly irregular word.

V. Fluency

Reading fluently involves reading accurately at a high rate and with expression or prosody (Kuhn, Schwanenflugel, & Meisinger, 2010; NICHD, 2000). Pikulski and Chard (2005) proposed that, in addition, reading fluency involves “efficient, effective word-recognition skills that permit a reader to construct the meaning of a text” (p. 510). Research suggests that children who read haltingly expend so much energy on word naming that few resources are left for comprehension. The work of many researchers has shown that repeated practice with familiar reading passages at a student’s independent reading level can improve fluency and lead to improved comprehension (Hudson, Lane, & Pullen, 2005; Padeliadu & Giazitidou, 2018; Samuels, 2002; Suggate, 2016). Findings from the National Reading Panel’s meta-analysis and review of reading research along with other research reviews have shown that oral reading practice such as repeated reading can have a positive effect on students’ word recognition and reading fluency as well as comprehension (NICHD, 2000; Therrien, 2004).

Learning A–Z Resources that Support Fluency Practice

Raz-Plus and Reading A–Z

- **Fluency Practice Passages** are short passages designed to improve automaticity and inflection. Through repeated one-minute readings, students can increase their reading rate and accuracy while also working on proper expression and smoothness.
- **Fluency Timed Readings** assess reading fluency with two types of assessments. The first is a one-minute timed reading of a passage to measure the number and accuracy of words read. The second has a student perform a timed reading of a series of sentences and then answer true/false statements about the sentences to demonstrate comprehension.
- **Fluency Standards Tables** can help set research-based fluency targets for students. Learning A–Z provides suggested targets from some of the leading researchers in the field, including Rasinski (2005) and Hasbrouck and Tindal (2017).

Headsprout

- **Headsprout Early Reading** includes specially designed fluency exercises at the sound and word level as well as at the sentence and passage level. Fluency exercises at the sound and word level include finding sounds within words, saying sounds, and saying words. At the passage level, students build oral reading fluency through repeated readings of passages that gradually increase in difficulty. The narrator models appropriate pace and intonation, while students do repeated readings of familiar and unfamiliar passages to build reading rates. Benchmark Reading Assessments provide the opportunity for teachers to record oral reading rate and additional reading opportunities are provided through the use of over 90 printable books.

VI. Vocabulary

Vocabulary is an important component of reading achievement. When first learning to read, students sound out written words and recognize them when they correspond to known words—that is, words already in their oral vocabulary. As reading skills increase, reading vocabulary becomes important for comprehending text (NICHHD, 2000).

Reviews of research on vocabulary and reading comprehension have found that vocabulary instruction can lead to increases in both vocabulary knowledge and reading comprehension and that a variety of instructional methods can be effective to teach vocabulary (Elleman, Lindo, Morphy, & Compton, 2009; NICHHD, 2000; Snow, 2002; Stahl & Fairbanks, 1986). While some vocabulary acquisition comes from incidental learning (NICHHD, 2000; Swanborn & de Glopper, 1999), research has shown that instructional strategies such as repeated exposure to words, pre-teaching vocabulary, and using context clues, are also effective—especially when these strategies happen in combination. Most students are capable of learning eight to 10 new words a week, according to the National Institute for Literacy (Armbruster, Lehr, & Osborn, 2009). Even brief instruction in word meanings can improve comprehension of text containing taught words, although studies have found that active processing tends to be more effective than passive receipt of definitions (NICHHD, 2000; Stahl & Fairbanks, 1986; Wright & Cervetti, 2016).

Learning A–Z Resources that Support Vocabulary Instruction

Vocabulary A–Z

- **Word Lists** include lists of vocabulary words organized by function; content area, tier; specialized sets such as Dolch, Fry, and Marzano word lists; and connection to other resources, including those for ELL learners. Teachers can access these word lists or create their own from a pool of over 17,000 words. Once a word list is created, its contents populate a printable **5-Day Lesson Plan** to introduce and practice the words in multiple modalities, including games. The five days in these teaching plans need not be consecutive – teachers can use this plan for spaced practice.
- **Game-based practice** is a series of online activities where students apply their knowledge of new words in game-like tasks and receive immediate feedback for their answers. In this online practice, students apply their vocabulary words by matching words to definitions, context sentences or images; filling out context sentences with the correct words; and using definitions, context sentences, and cloze sentences as clues to find or spell vocabulary words. Teachers can also digitally assign game-based practice for vocabulary words from texts in Reading A–Z, Raz-Plus, Science A–Z, and popular basal programs.
- **Quizzes** are printable or interactive tools that allow teachers to quickly gauge student knowledge of target words.
- **Premade Vocabulary Lessons** are 5-Day Lesson Plans that include words found in specific texts from Reading A–Z, Raz-Plus, Science A–Z, and popular basal programs. Through their connection with specific texts, these lessons help to ensure that students also have a wider context for the target words. The words in premade vocabulary lessons can be assigned digitally to students in the form of game-based practice.

Raz-Plus and Reading A–Z

- **Vocabulary Graphic Organizers**, such as picture dictionaries and word meaning maps, are visual tools that support vocabulary learning.

Headsprout

- **Headsprout Early Reading** includes vocabulary activities throughout its 80-lesson sequence. Students begin to add words that are likely to be in their spoken vocabulary to their reading vocabulary. Through the use of character names and other less common words, they learn that words they may have never before encountered have meaning as well. New vocabulary words are also integrated into a variety of contexts, including online and printed stories.
- **Headsprout Reading Comprehension** explicitly teaches vocabulary words as well as strategies to derive word meaning from context. Students are directly taught target vocabulary words before reading a passage, and learn other word meanings through structured exercises in which they match words, pictures, and definitions. While reading a text, students are also able to select words to hear the word's pronunciation and meaning. Students learn an explicit strategy to derive the meaning of a word from its surrounding context, and vocabulary words are used throughout the program in multiple contexts, so students are exposed to and use the word multiple times.

VII. Comprehension

Comprehension is the ultimate goal of all reading instruction. When students comprehend text, they can extract meaning from the printed word and derive knowledge or pleasure from what they read. The Rand Reading Study Group defined reading comprehension as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (Snow, 2002).

Instruction in the other foundational reading skills—phonemic awareness, phonics, fluency, and vocabulary—all have an effect on reading comprehension. Learners need to be able to decode, fluently read, and understand words in order to understand a text (Suggate, 2016; Wright & Cervetti, 2016). However, research has shown that explicit instruction in reading comprehension skills and strategies also has a positive effect on reading comprehension and that these effects maintain over time (NICHD, 2000; Suggate, 2016).

Reading comprehension strategies are procedures that teachers can teach learners through modeling and guidance and that learners can then ultimately apply independently while they read to increase their understanding of a text. For example, a reader might generate *who*, *what*, *how*, *when*, or *where* questions as they read (NICHD, 2000).

The National Reading Panel (2000) reviewed 205 studies investigating the effect of instructional strategies on reading comprehension and found that seven individual methods—monitoring understanding, answering questions, generating questions, summarizing, analyzing story structure, using graphic organizers, and cooperative learning—had positive effects on reading comprehension. Of these individual strategies, generating questions had the strongest evidence of effectiveness. However, strong effects were shown when multiple strategies were incorporated into a teaching model in which the teacher explained and modeled the use of combinations of strategies. The National Reading Panel's recommendation was therefore to combine the individual comprehension strategies when teaching their application.

Based on a review of 27 studies on reading comprehension in students in grades K to 3, Shanahan et al. (2010) also identified teaching reading comprehension strategies as having the strongest evidence base. In addition, Shanahan et al. recommended (1) teaching students to identify the organizational structure of the text, (2) guiding students through quality discussions of text, (3) selecting texts specifically for the purpose of supporting the learning and application of comprehension skills, and (4) establishing an engaging and motivating learning environment.

Strategies and Methods for Teaching Reading Comprehension	
Strategy/Method	Description
Monitoring understanding	Monitoring understanding means being an active, thoughtful reader. Readers are aware of their thought processes and their use of reading strategies.
Answering questions	Teachers ask questions to guide student understanding.
Generating questions	Students generate their own questions regarding who, what, where, when, why, and how.
Summarizing	Students identify main ideas and relevant details of the text.
Analyzing story structure	Students examine story elements such as sequence, setting, characters, and events.
Graphic organizers	Students use visual devices to represent elements and ideas embedded within the text.
Cooperative grouping	Students work together while learning and using comprehension strategies.
Incorporating multiple strategies	Teachers model how to apply a combination of the strategies above to extract meaning from text.

Learning A–Z Resources that Support Comprehension Instruction

Raz-Plus and Reading A–Z

- **Shared Reading Books** provide opportunities for teachers to model close reading, text-dependent questioning, and strategies for asking and answering questions with each projectable “big” book as they follow a five-day lesson.
- **Reading Graphic Organizers** help students visually sort new information into familiar categories, analyze relations between old and new information, and create a simple structure for thinking about information in new ways.
- **Close Reading Packs and Passages** help students practice analyzing, evaluating, and thinking critically about a text as they read it multiple times. The Close Read Question Guides include text-dependent questions that help teachers guide students to use annotation and other close reading skills to find the layers of meaning within a text.
- **Comprehension Skill Packs** include short passages to model and practice specific comprehension skills. Each lesson plan follows the “teach, practice, and apply” instructional approach to support students as they build meaning from texts.

Headsprout

- **Headsprout Early Reading** uses comprehension indicators to test whether students understand the text they are decoding. Comprehension activities within the program include: choosing which picture (from an array of three) “goes with” the sentence the student just read; constructing meaning by building sentences that result in an animated picture depicting the sentence; and expressing meaning by building sentences that describe a picture. Printable stories provide further opportunities for story-based discussion and questions.
- **Headsprout Reading Comprehension** provides explicit instruction and practice in reading comprehension strategies to answer literal, inferential, main idea, and derived meaning (vocabulary) questions. Students also learn to organize information using Venn, sequence, cluster, and hierarchical diagrams and to use resources such as tables of contents and different types of illustrations.

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Reading to Learn: Going Beyond the Foundations

Reading to Learn: Going Beyond the Foundations

Introduction

After students have learned the foundational skills necessary to read fluently and comprehend text, they are ready to use reading as a way to learn about a variety of subjects. Reading to learn is critical for success in college and careers where students will encounter a variety of complex informational texts. Thus, students at all levels should engage with text of sufficient complexity, answer text-dependent questions and use evidence from text to support their answers, engage in close reading, and read a larger proportion of informational text (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

I. Text Complexity

While identifying main ideas, deriving the meaning of words from context, and making inferences are important skills, what separates students who score at or above benchmark on the reading portion of the ACT (which predicts successful performance in an introductory college course) is not performance on comprehension questions in general, but instead the ability to answer questions about complex text (ACT, Inc., 2006).

Complex text is text that includes subtle or complex relationships among ideas or characters, a large amount of sophisticated information, elaborate or unconventional text structures and style, context-dependent vocabulary, and an implicit or ambiguous purpose. In response to the need for students to understand complex text and in light of research on the decreasing ability of students to do so (c.f., Adams, 2009), recent educational efforts have introduced a focus on text complexity, understood as an appropriate degree of a given text's complexity relative to the student's grade level.

There are three dimensions that together determine the complexity of a text: quantitative, qualitative, and consideration of the reader and the reading task (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

The quantitative dimension includes those aspects of the text more easily evaluated by computer programs, such as sentence length and word frequency. Measures of readability such as Flesch-Kincaid and Lexile® use formulas based on quantitative factors. Research has shown that several quantitative measures correlate with student performance and grade level, indicating that use of these measures can assist teachers in selecting text at an appropriate level of complexity (Nelson, Perfetti, Liben, & Liben, 2012).

The qualitative dimension includes aspects of the text more easily evaluated by a human reader, such as text structure (e.g., Is the structure conventional or unconventional? Are illustrations simple or complex and are they required to understand the text?), how clear the language is (e.g., Is language clear and conversational? Is figurative language or domain-specific vocabulary used?), knowledge demands (e.g., How much background knowledge is required to understand the text?), and levels of meaning and purpose (e.g., Is there one level of meaning or multiple levels? Is the purpose explicitly stated or implicit?). These aspects of a text are an important supplement to quantitative measures. Sometimes, for example, quantitative measures of a text might show a low reading level, but sophisticated themes or other aspects of the text may make it most appropriate for a much older, more advanced reader (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010; 2017; Pearson & Hiebert, 2014).

The consideration of the reading and the reading task (the third dimension of text complexity) refers to the fact that comprehension of a text depends on the reader's ability and background and on the specific task being asked of the reader. A reader who has a strong background in a particular area may find a text in that area much easier to comprehend than a reader without such background. A task requiring the reader to summarize the plot may be much easier than one asking the reader to analyze complex relationships. In addition, while a reader may struggle with a particular text while reading independently, he or she may be able to productively engage with the text given appropriate scaffolding. Only teachers can effectively evaluate these factors when choosing a particular text for their students (Valencia, Wixson, & Pearson, 2014).

Learning A–Z's proprietary Text Leveling System uses both quantitative and qualitative leveling criteria to calculate text complexity. Quantitative measures include total word count, number of different words and ratio of different words to total words, number of high-frequency words and ratio of high-frequency words to total words, number of low-frequency words and ratio of low-frequency words to total words, sentence length, and sentence complexity. Qualitative measures include the predictability of the text, its structure and organization, illustration support, the complexity of and reliance on infographics, and knowledge demands. Learning A–Z's leveling system correlates with other common leveling systems and assists teachers in selecting texts most appropriate for their students and reading tasks.

Learning A–Z Resources for Complex Texts

Raz-Plus and Reading A–Z

- **Leveled Books** are available at 29 different levels of difficulty in printable, projectable, and digital formats.
- **Content Area Reading** organizes leveled books into featured groups of common content area topics.

Headsprout

- **Headsprout Reading Comprehension** teaches comprehension skills across increasingly complex text, moving from a mid-second grade reading level when first introducing reading comprehension strategies to a mid-fourth grade level by the end of the 50-episode program. As students demonstrate mastery, the program introduces more complex literary and informational texts, poetry, and visual devices such as Venn diagrams, maps, scales, cross sections, and tables of contents.

Science A–Z

- **FOCUS Books** cover high-interest science topics at three different reading levels and are available in printable, projectable, and digital formats.

II. Text-Dependent Questions

In addition to reading complex text, students need to be able to answer text-dependent questions. In contrast to questions that can be answered based on students' personal experiences, opinions or other sources, text-dependent questions can be answered only by referring back to the text (Fisher & Frey, 2012b; Shanahan, 2013).

Good text-dependent questions are those that are central to the text; they are important for understanding the text's key ideas and details and for interpreting the text by analyzing its craft and structure (Shanahan, 2013). Although some questions may ask for information explicitly stated in the text, text-dependent questions may also require that students make inferences and evaluate the text. The distinguishing feature of text-dependent questions is that their answers must be supported by evidence from the text itself (Fisher & Frey, 2012b; Shanahan, 2013).

Learning A–Z Resources for Text-Dependent Questions

Raz-Plus and Reading A–Z

- **Comprehension Skill Packs** include short passages with text-dependent questions focused on a particular reading comprehension skill, such as analyzing characters, determining author’s purpose, determining the main idea, or analyzing text structure.
- **Close Reading Packs** include short passages with a key question that students must answer based on evidence from the text.
- **Paired Books** allow students to compare multiple, related texts. Three types of text-dependent questions require students to (1) construct an answer from evidence found in one place within a text, (2) gather evidence from multiple places within a text or across texts, and (3) make inferences based on evidence from the text and their own experience.
- **Leveled Book Common Core Lesson Supplements** provide text-dependent questions for popular books at each level.

Headsprout

- **Headsprout Reading Comprehension** includes multiple text-dependent questions for each passage in the program and several activities in which students must look back in the passage and locate textual evidence that supports their answers.

Science A–Z

- **FOCUS Books** include text-dependent questions that students can answer based on the text.

III. Close Reading

Close reading involves multiple readings of short passages of complex text in order to identify what the text explicitly states and to make sound inferences from the text. It also involves discussion of text-dependent questions where students must cite evidence from the text to support their answers (Brown & Kappes, 2012; Fisher & Frey, 2012a).

The specific practices involved in close reading can vary with different subject matters, text types, and purposes (Fang, 2016). In general, however, when students participate in close reading, they first read to identify main ideas and details, and subsequently reread to gain a deeper understanding of the text, identifying its craft and structure and analyzing the ideas presented. Students systematically move from the literal level of a text to its structural level and lastly to its inferential level: focused on inferences, inter-text connections, opinions, and arguments that can be made from the text (Fisher & Frey, 2015).

Although research on close reading and its components is in its early stages (Fisher & Frey, 2015), initial studies have shown close reading can be effective in improving reading performance. For example, in a study comparing reading interventions involving close reading of complex texts to more typical interventions involving computer-based instruction, small-group instruction and independent reading, Fisher & Frey (2014) found significant differences in favor of the close reading instruction.

Learning A–Z Resources to Support Close Reading

Raz-Plus and Reading A–Z

- **Close Reading Packs** include short passages with a key question that students must answer based on evidence from the text.

- **Close Read Passages and Question Guides** guide students through repeated readings of a single passage using strategic discussion and questioning at multiple layers of depth.
- **Reading Graphic Organizers** support reading strategies, comprehension skills, and learning processes including retelling, determining main idea and supporting details, analyzing text structure, and making inferences.

IV. Informational Text

Informational text—a broad category of nonfiction resources including biographies and autobiographies; books about history, social studies, science, and the arts; technical texts (including how-to books and procedural books); and literary nonfiction—makes up the majority of text older students and adults read (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

However, younger students often do not get as much exposure to and instruction related to reading informational text as they do with literary text. For example, in a content analysis of basal reading programs, Braker-Walters (2014) found that, on average, informational text accounted for 31% of text selections and only 16% of pages in fourth-grade basal readers. In a survey of books read aloud by preschool through third-grade teachers, only 8% were informational texts and of those, the majority were about topics in life science (Yopp & Yopp, 2012).

Some authors (e.g., Sanacore & Palumbo, 2009) believe this lack of exposure to and instruction in informational text may be responsible for declines in reading comprehension seen when students reach fourth grade, when informational text begins to make up a greater proportion of text read and students transition from “learning to read” to “reading to learn.” Therefore, it is important to ensure even young students are exposed to and receive instruction in reading and comprehending informational text.

Learning A–Z Resources for Informational Text

Raz-Plus and Reading A–Z

- **Leveled Books** and their accompanying lesson plans, worksheets, comprehension quizzes, and discussion cards help teach students skills and strategies to successfully read and comprehend informational text. Over 1,000 leveled nonfiction books are available across a variety of subjects.
- **Content Area Reading** includes leveled book collections spanning art, music, math, science, and social studies.
- **Visual Devices** with accompanying lesson plans and worksheets help students read and interpret the visual devices that often accompany informational text such as diagrams, flowcharts, bar graphs, and pie charts.

Headsprout

- **Headsprout Reading Comprehension** includes informational passages throughout the program. Students read and answer questions about each passage, finding evidence in the text to support their answers. Interpreting visual devices such as maps and cross-section diagrams is also explicitly taught in the program. Once students have learned how to interpret a visual device, it is incorporated into later passages and students answer questions requiring its interpretation.

Science A–Z

- **Unit Nonfiction Books** provide informational text at multiple reading levels across science content areas.

- **FOCUS Books** are additional science books on high-interest topics for each Science A–Z instructional unit. FOCUS books are provided at multiple reading levels for each grade span and include reading comprehension assessments, inquiry-based science activities, and instructional support for teachers.
- **Quick Reads** are single-page resources that address specific science topics.
- **Science in the News** provides news articles about current events in multiple areas of science, including technology and engineering. Each issue includes versions written for early elementary, middle elementary, and upper elementary students.
- **Graphic Organizers** support content area learning and reading comprehension by helping students sort ideas, analyze relationships, review concepts, and demonstrate new understanding.

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21st Century Skills: Preparing Students for Future Success

21st Century Skills: Preparing Students for Future Success

Introduction

Although critical thinking, communication, collaboration, and creativity have always been important, recent years have seen an increased focus on these and other “21st century skills” as occupations increasingly incorporate some form of digital technology, and subsequent changes in the nature of work have increased demand for analytical, problem-solving, and interpersonal skills (National Research Council, 2012; Partnership for 21st Century Learning [P21], 2015). In addition, changes in technology and job requirements demand that people learn new skills throughout their lives, requiring increased levels of learning ability and self-management (Autor, Levy, & Murnane, 2003; Berger & Frey, 2016). A study by the OECD reported that “adults with higher proficiency in literacy, numeracy, and problem solving in technology-rich environments tend to have better outcomes in the labour market than their less-proficient peers. They have greater chances of being employed and, if employed, of earning higher wages” (Organization for Economic Cooperation and Development, 2016, p. 17).

The National Research Council (2012) defines 21st century competencies as “transferable knowledge, including content knowledge in a domain and knowledge of how, why and when to apply this knowledge to answer questions and solve problems” (p. 6). The emphasis is on “deeper learning, [which] allows the individual to transfer what was learned to solve new problems” (p. 6).

P21’s (2015) framework includes four major areas of “knowledge, skills and expertise students should master to succeed in work and life in the 21st century” (p. 2). These areas are:

1. key subjects and themes which encompass language arts, math, and science, as well as global awareness and civic literacy
2. learning and innovation skills that include creativity, critical thinking and problem solving, and communication and collaboration
3. information, media, and technology skills, including information and media literacy
4. life and career skills including flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility.

Among the areas specified in the P21 framework, the “Four Cs” (critical thinking, communication, collaboration, and creativity) have been identified as most important for K–12 education (National Education Association, 2012).

Knowledge and skills in the content areas consistent with the call for 21st century skills also appear in new literacy and science standards. The National Research Council (2012) identified constructing and evaluating evidence-based arguments, non-routine problem solving, complex communication, and critical reading as the “areas of strongest overlap” between 21st century skills and modern academic standards.

Learning A–Z resources can help support the development of 21st century skills through content in English language arts and science in which communication, collaboration, and argument are key to solving problems as a group.

Learning A–Z Resources to Support 21st Century Skills

Raz-Plus and Reading A–Z

- **Project-Based Learning Packs** were designed to develop students’ creativity, critical thinking, problem solving, communication, and teamwork skills. Each pack includes a lesson plan with an anchor text, driving question, and multiple resources to support guided inquiry.
- **Literature Circles** involve a structured process that includes research-based teaching strategies, such as encouraging motivation with choice, modeling and support in guiding students’ independent learning, and meaningful engagement with text both independently and in group discussion. Students have an opportunity to develop and practice close reading as well as critical thinking, communication, and collaboration. A meta-analysis of studies on the effects of classroom discussion on reading comprehension found that literature circles resulted in positive effects related to the amount of student talk, general comprehension, and text-implicit comprehension (Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009).
- **Argumentation Skill Packs** use the “teach, practice, and apply” instructional approach to introduce students to the fundamentals of argument, including identifying claims, reasons, evidence, and point of view.
- **Close Reading Packs** include short passages with a key question that students must answer based on evidence from the text.
- **Close Read Passages and Question Guides** lead students through repeated readings of a single passage using strategic discussion and questioning at multiple layers of depth.
- **Leveled Books** include discussion cards to promote critical thinking, collaboration, and discussion.
- **Paired Books** allow students to compare multiple, related texts. Three types of text-dependent questions require students to (1) construct an answer from evidence found in one place within a text, (2) gather evidence from multiple places within a text or across texts, and (3) make inferences based on evidence from the text and experience.

Science A–Z

- **Investigation Packs** are group science activities designed to help students apply scientific practices, engage in scientific argumentation, and develop critical thinking, collaboration, and communication. Investigation Files feature high-interest, in-depth informational text. Students do a close reading of the Investigation Files and then cite evidence that helps them solve the Mystery File in each pack through group discussion.
- **Project-Based Learning Packs** provide resources to encourage development of creativity, critical thinking, communication, and collaboration skills. Students work in teams to investigate an overarching science question or design solutions for an engineering challenge.
- **Debates** are structured exercises to help students develop skills in scientific argumentation based on evidence. Students are presented with a fictional but realistic scenario and must consider arguments for or against a proposal, take a position, and defend it in a friendly, structured format. Students learn to conduct research, form opinions, communicate with peers, consider other points of view, and make new judgments based on arguments supported by evidence.

- **Process Activities** are hands-on science activities and experiments. Students identify and solve problems and communicate their findings through speaking, listening, and writing. Students also practice proposing new solutions, designing experiments, and testing new ideas as they collaborate with peers.
- **Storylines** include phenomenon-driven lesson plans and assessments. Each Storyline includes an exploration of Disciplinary Core Ideas and Crosscutting Concepts through engagement in Science and Engineering Practices within an integrated series of lessons.
- **Science Fair Resources** include lists of science fair project ideas for students to choose from or use as inspiration for their own research questions.

Writing A–Z

- **Process Writing Lessons** include leveled resources to teach the five steps of the writing process—prewrite, draft, revise, edit, and publish—across informative/explanatory, narrative, opinion/argument, and transactional writing genres. Studies have shown that explicit strategy instruction in planning, revising, and editing and a process approach to writing can be effective in improving the quality of students’ writing (Graham, McKeown, Kihara, & Harris, 2012; Graham & Perin, 2007).
- **Skill Lessons** focus on individual composition elements, including conventions, sentences (simple, compound, combined, and complex), word choice, openings, and closings.
- **Build-A-Book** allows students to exercise their creativity and media skills as they write and publish their own digital books. Students can create books in nearly any genre or subject. Build-A-Book supports steps of the writing process with prewriting, drafting, revision, and publication to the online Kids Writing Library.
- **Write Your Way** supports students’ creative writing skills as they develop short writing compositions and draw pictures to support their text. The tool can be used for journaling, freewriting, quick essays, responses to reading, or other daily writing activities.
- **Wordless Books** are illustrated books that allow students to create and communicate an original story based on the pictures given.
- **Writing Prompts** include photographs, illustrations, and written prompts that can be used to inspire original student compositions.

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Ensuring Writing Proficiency: Best Practices for Teaching Writing

Ensuring Writing Proficiency: Best Practices for Teaching Writing

Introduction

Writing as a form of communication has become ubiquitous due to the rapid growth in communication technologies. The number of business and consumer emails sent each day of 2017 was estimated at 269 billion, a number that has been growing and will likely continue to grow (The Radicati Group, 2017). Writing is essential to everyday life as a way to maintain interpersonal relationships and as an important tool that can be used to influence others, learn, and communicate. The growing importance and versatility of writing means that all students should develop skills in effective written communication (Graham & Harris, 2019).

However, recent assessment results show that a large proportion of students have not developed the skills necessary to communicate effectively in writing. The 2011 National Assessment of Education Progress assessed students on their ability to write effectively for “situations common to both academic and workplace settings and asked students to write for several purposes and communicate to different audiences” (National Center for Education Statistics, 2011, p. 1). Only 27% of students assessed performed at or above a proficient level, demonstrating that they had acquired skills enabling them to communicate effectively in writing (National Center for Education Statistics, 2011).

Skills for Effective Written Communication

People write for specific purposes and specific audiences. Therefore, they must develop and organize their ideas in a way that meets their communication goals. Current guidelines and standards focus on three major purposes for writing in academic and workplace settings: to persuade, to explain, and to convey experiences whether real or imagined (National Assessment Governing Board, 2017; National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010). Persuasion requires the ability to write arguments that are supported by reason and evidence; explanation requires the ability to write clear, well-organized informational text; and conveying experiences requires students to write adequately detailed, appropriately organized narrative text (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010).

Writing also requires skill in research, ranging from superficial investigation to in-depth study. Writing informative or persuasive text requires a substantial understanding of the subject under discussion, which often involves students gathering relevant information from different sources, evaluating it for credibility, and transforming it into a useful format. The writing and publication process also deserves attention: planning, drafting, revising, editing, and using technology to publish text and to communicate and collaborate with others (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010).

Research-Based Teaching Strategies for Writing

Several meta-analyses, referenced below, have reviewed the existing research on effective writing instruction and found effective instructional practices for both elementary and adolescent learners.

1. **Strategy Instruction:** Teaching writing strategies such as planning, revising, and editing improves the quality of writing for typically developing students as well as for struggling writers in elementary and higher grades. The research on writing strategies is among the most robust in the writing instruction literature with the largest effect sizes (Gillespie & Graham, 2014; Graham, 2006; Graham, Harris, & Santangelo, 2015; Graham, McKeown, Kihara, & Harris, 2012; Graham & Perin, 2007a, 2007b; Rogers & Graham, 2008; Smedt & van Keer, 2014). In addition, research with students in Grades 2 to 6 has shown that instruction in how to regulate these writing strategies using procedures such as goal setting and self-assessment also has a positive impact on the quality of students’ writing (Graham et al., 2012).

2. **Collaboration:** Research has shown that the quality of students' writing improves when they work together in planning, drafting, revising, and editing. This effect was shown in research with both adolescents and elementary students (Graham et al., 2015; Graham et al., 2012; Graham & Perin, 2007a, 2007b; Smedt & van Keer, 2014).
3. **Goal Setting:** Setting specific goals has been shown to improve the quality of writing for both adolescent and elementary students and for typically developing students as well as those with learning disabilities. Goal setting may involve general as well as specific goals. For example, students might set a general purpose of persuasion for their writing and set more specific goals for the final product or for what to accomplish when revising (e.g., add a counterargument) (Gillespie & Graham, 2014; Graham et al., 2015; Graham et al., 2012; Graham & Perin, 2007a, 2007b).
4. **Pre-writing:** Pre-writing involves activities such as gathering and organizing information and ideas before composing a first draft. Research with both elementary and adolescent students has shown that students' writing improves when they engage in pre-writing activities (Graham et al., 2012; Graham & Perin, 2007a, 2007b; Rogers & Graham, 2008).
5. **Word Processing:** Research has shown that using word processing software to write as opposed to writing by hand has a positive effect on writing quality for students in Grades 1–12, including weaker writers and readers (Graham et al., 2015; Graham et al., 2012; Graham & Perin, 2007a, 2007b; Morphy & Graham, 2012; Smedt & van Keer, 2014).
6. **The Process Approach:** The process approach to writing is an instructional method that includes several components. Although no standard definition for this approach exists, in general it involves students engaging in “cycles of planning (setting goals, generating ideas, organizing ideas), translating (putting a writing plan into action), and reviewing (evaluating, editing, revising)” (Graham & Sandmel, 2011, p. 396). The approach involves a workshop environment where students collaborate and focus on writing for real purposes and audiences, ownership of writing, and self-reflection and evaluation. Personalized writing instruction is provided as needed through mini-lessons and conferences (Graham, & Sandmel, 2011). Although effect sizes for process writing approaches were smaller than for other methods, such as strategy instruction, the process writing approach has shown positive effects on writing quality for both typically developing students in Grades 1–12 and for students with learning disabilities (Gillespie & Graham, 2014; Graham et al., 2015; Graham et al., 2012; Graham & Perin, 2007a, 2007b; Graham, & Sandmel, 2011).
7. **Reading:** Teaching reading (especially phonics, phonological awareness, and comprehension skills) and increasing students' interaction with text—both through reading and observing others read—has been shown to enhance the quality of students' writing (Graham et al., 2018).
8. **Models:** Reading and analyzing models of good writing has been shown to have a positive effect on writing quality (Graham et al., 2015; Graham & Perin, 2007a, 2007b).

The following additional instructional strategies have had positive effects on the writing of elementary students.

1. **Positive Writing Environment:** Effective teachers create positive writing environments in which (1) writing is seen as a fun, enjoyable activity; (2) writing is shared, displayed, and published; (3) effort is encouraged and success is attributed to learning; (4) positive interactions are promoted; (5) realistic but high expectations are set; (6) writing assignments are appropriate to students' varied skill levels and interests; (7) students are kept engaged; and (8) self-regulation is encouraged (Graham et al., 2015).
2. **Text Structure:** Teaching students narrative and expository text structures has been shown to have a positive impact on the writing quality of typically developing students in Grades 2–6 (Graham et al., 2015; Graham et al., 2012).

3. **Spelling, Handwriting, and Keyboarding:** For students in Grades 1–3, teaching spelling, handwriting, and keyboarding skills has been shown to have a positive impact on writing quality (Graham et al., 2015; Graham et al., 2012).
4. **Vocabulary:** Teaching vocabulary specific to the genre or topic has been shown to improve the quality of students' writing (Graham et al., 2015).
5. **Feedback:** The writing of students in Grades 1–6 improved significantly when teachers gave feedback on specific aspects of students' writing or on their progress in improving their writing (Graham et al., 2015; Graham, Hebert, & Harris, 2015; Graham et al., 2012).
6. **Amount of Writing:** Increasing the amount that students wrote by at least 15 minutes per day had a small but significant impact on the writing quality of students in Grades 2–6 (Graham et al., 2015; Graham et al., 2012).

Learning A–Z Resources to Support Writing Proficiency

Writing A–Z

- **Process Writing Lessons and Tools** include lessons and resources to teach informative/explanatory, narrative, and opinion/argument writing as well as transactional (social and business) writing skills such as writing business letters, emails, blog posts, and speeches. Each lesson includes the five steps of the writing process: prewriting, drafting, revising, editing, and publishing, as well as a focus on the traits of good writing, such as organization, voice, word choice, and conventions. Lessons are provided at four developmental writing levels to match students' range of skills and abilities. Process writing tools include graphic organizers, revision checklists, editing guides, and rubrics, as well as writing samples and connections to leveled books.
- **Skill Lessons** are mini-lessons that teach critical writing skills, including writing conventions; how to create simple, compound, and complex sentences; word choice; and writing openings and endings.
- **Online Writing** allows students to use a computer for their compositions and includes a Process Writing Workshop; a Write Your Way tool for writing short compositions; and Build-A-Book, in which students can create their own full-color online books. Step-by-step prompts that correspond to the writing process appear automatically to help students with their writing and to encourage careful drafting, writing, editing, and revising, including rubrics that ask students to check their own writing for specific features they may have missed. Students then can publish their writings to the class (via the teacher approving the publication).
- **Quick Writing Activities** assist teachers in incorporating writing into their classes every day. Activities include: Writing Prompts containing photographs, illustrations, and written prompts for writing; Writer Response activity sheets, in which students write a response to a leveled book from Reading A–Z; and Write-Aways, which prompt quick compositions in the four major writing genres.
- **Emerging Writer Lessons and Resources** support skill development for emerging writers in pre-kindergarten and kindergarten. These resources span six different stages of development, ranging from labeling pictures, to using sight words, nouns, verbs, and adjectives, to crafting sentences with details.

Raz-Plus and Reading A–Z

- **Leveled Books** are available at 29 different levels of difficulty in printable, projectable, and digital formats. Many of the books have “wordless” versions with just the pictures, which allow students to write their own book based on the images. Many other books include a Writer’s Response, where students are asked to write their answer to a central question about the book they read.
- **Close Reading Packs** include short passages with a key question that students must answer based on evidence from the text. First, students write their answer to the question individually. Then, students work in groups to write an answer to the question as a team, drawing from individual answers and working with graphic organizers to help clarify the final group answer.
- **Content Area Reading** organizes leveled books into featured groups of common content area topics such as art, science, math, and social studies. These resources serve as early sources of information for students doing research for writing purposes.

Science A–Z

- **Investigation Packs** are group science activities where students apply scientific practices and engage in scientific argumentation. Investigation Files feature high-interest, in-depth informational text. Students do a close reading of the texts and then cite evidence that helps them solve the Mystery File in each pack. While writing their answers, students first craft their own answer, write important vocabulary words and their definitions, and report on the evidence they used to answer the question. Students then work in groups to combine the evidence gathered by all group members and write a final response to the question as a team.
- **Project-Based Learning Packs** include inquiry-based science projects. Students work in teams to investigate an overarching science question or design solutions for an engineering challenge. Throughout the project, students collaborate in their groups to write an answer to the question or the solution to the engineering challenge, and also to write about their learning process:
1) “What do we know about the topic?”, 2) “What do we want to know about the topic?”,
3) “What have we learned about the topic?”, and 4) “What do we still want to learn about the topic?”
- **Process Activities** are hands-on science activities and experiments. Students identify and solve problems and communicate their findings through speaking, listening, and writing.

Vocabulary A–Z

- **Vocabulary A–Z** includes content area vocabulary in the arts, computer technology, health, language arts, mathematics, music, physical education and sports, science, and social studies to help students learn the vocabulary words they need for clearer, more precise writing.

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Teaching Science: Scientific Literacy and Inquiry

Teaching Science: Scientific Literacy and Inquiry

Introduction

Students must develop skills and knowledge in science, engineering, technology, and mathematics at higher levels than previously required in order to keep up in an increasingly information- and technology-rich world (National Science Board, 2007). To make informed decisions about aspects of daily life such as personal healthcare and public policy issues, every person needs at least a basic understanding of science and engineering (National Research Council, 2012; Organization for Economic Cooperation and Development [OECD], 2017).

To help address this need, the National Research Council (2012) produced *A Framework for K–12 Science Education*. The goal of the framework is

“to ensure that by the end of 12th grade, all students have some appreciation of the beauty and wonder of science; possess sufficient knowledge of science and engineering to engage in public discussions on related issues; are careful consumers of scientific and technological information related to their everyday lives; are able to continue to learn about science outside school; and have the skills to enter careers of their choice, including (but not limited to) careers in science, engineering, and technology” (p. 1).

Learning A–Z’s science products were designed to support the development of students’ scientific literacy and inquiry skills.

I. Scientific Literacy

Scientific literacy, as defined by the OECD, is

“the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically” (OECD, 2017, p. 15).

The NRC’s (2012) Framework For K–12 Science Education and Next Generation Science Standards specifies three major dimensions on which science education should focus to produce scientifically literate citizens: (1) scientific and engineering practices, (2) cross-cutting concepts, and (3) core ideas in four disciplinary areas: physical sciences; life sciences; earth and space sciences; and engineering, technology, and applications of science.

Scientific and engineering practices include the practices in which scientists and engineers engage. Familiarity and experience with these practices can help students better understand how knowledge about the world develops, how problems are solved and new technologies created, and how science and engineering are intertwined. These practices include:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking

6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information (NRC, 2012, p. 49).

Cross-cutting concepts are concepts that “unify the study of science and engineering through their common application across fields” (NRC, 2012, p. 2). The committee who developed the framework identified seven cross-cutting concepts important for students to learn: patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter: flows, cycles, and conservation; structure and function; and stability and change.

Core ideas are those ideas that:

1. Have broad importance across multiple sciences or engineering disciplines or are a key organizing principle of a single discipline
2. Provide a key tool for understanding or investigating more complex ideas and solving problems
3. Relate to the interests and life experiences of students or connect to societal or personal concerns that require scientific or technological knowledge
4. Are teachable and learnable over multiple grades at increasing levels of depth and sophistication. That is, the idea can be made accessible to younger students but is broad enough to sustain continued investigation over the years (NRC, 2012, p. 31).

In the physical sciences, core ideas include: matter and its interactions; motion and stability—forces and interactions; energy; and waves and their applications in technologies for information transfer. In life sciences, core ideas include: from molecules to organisms—structures and processes; ecosystems—interactions, energy, and dynamics; heredity—inheritance and variation in traits; and biological evolution—unity and diversity. Core ideas in earth sciences include: Earth’s place in the universe; Earth’s systems; and Earth and human activity. In engineering, technology, and applications of science, core ideas include engineering design and links among engineering, technology, science, and society (NRC, 2012).

II. Scientific Inquiry

The Framework for K-12 Science Education recommends that “the learning experiences provided for students should engage them with fundamental questions about the world and with how scientists have investigated and found answers to those questions. Throughout grades K-12, students should have the opportunity to carry out scientific investigations and engineering design projects related to the disciplinary core ideas” (NRC, 2012, p. 9).

In a meta-analysis of 61 studies on science teaching strategies, Schroeder, Scott, Tolson, Huang, and Lee (2007) found that enhanced context strategies were highly effective, with effect sizes ranging from 0.65 to 1.48. Such strategies include: using problem-based learning, taking field trips and encouraging reflection; collaborative strategies involving arranging students in groups to engage in inquiry projects and discussions; questioning strategies; and guided inquiry activities. In a meta-analysis examining the effects of different components and levels of guidance on inquiry learning, Furtak, Seidel, Iverson, and Briggs (2012) found that inquiry-based teaching overall had a positive effect on student learning, with teacher-guided instructional activities including epistemic (e.g., nature of science, drawing conclusions based on evidence, and generating and revising theories) or a combination of procedural (asking scientifically oriented questions, experimental design, executing scientific procedures, recording data, and representing data) and social (e.g., participating in class discussion, arguing/debating scientific ideas, and working collaboratively) components resulting in the greatest effect sizes.

Inquiry can occur along a continuum with various levels of support and guidance for students. Banchi and Bell (2008) described an inquiry continuum consisting of four main levels, with the most appropriate level depending on students' inquiry skills.

1. **Confirmation Inquiry:** Teachers provide students with a familiar science topic to explore with the aim of confirming existing content knowledge.
2. **Structured Inquiry:** Students are given a research question to which they do not know the answer and work to identify relationships between variables to propose an explanation.
3. **Guided Inquiry:** Teachers provide students with only a research question and leave students to design and execute an experiment to answer that question.
4. **Open Inquiry:** Students develop their own research questions and experiment, design, and collaborate to draw evidence-based conclusions.

Learning A–Z Resources to Support Scientific Literacy and Inquiry

Science A–Z

- **Investigation Packs** are group science activities designed to help students apply scientific practices and engage in scientific argumentation. Investigation Files feature high-interest, in-depth informational text. Students do a close reading of the Investigation Files and then cite evidence that helps them solve the Mystery File in each pack through group discussion.
- **Project-Based Learning Packs** include inquiry-based science projects and activities that promote collaboration and critical thinking. Students work in teams to investigate an overarching science question or to design solutions for an engineering challenge.
- **Storylines** include phenomenon-driven lesson plans and assessments designed around the three dimensions of the Next Generation Science Standards* (NGSS). Each Storyline includes an exploration of Disciplinary Core Ideas and Crosscutting Concepts through engagement in Science and Engineering Practices within an integrated series of lessons.
- **Debates** are structured exercises designed to help students develop skills in scientific argumentation based on evidence. Students are presented with a fictional but realistic scenario and must consider arguments for or against a proposal, take a position, and defend it in a friendly, structured format. Debates integrate science content and research with critical thinking, communication, and collaboration as students learn to conduct research, form opinions, communicate with peers, consider other points of view, and reach new conclusions based on arguments supported by evidence.
- **FOCUS Books** include text on high-interest topics and are designed to help students focus more deeply on individual concepts presented within the broader unit content. The books come with reading comprehension assessments and hands-on, inquiry-based science activities.
- **Process Activities** are hands-on science activities and experiments. Students identify and solve problems and communicate their findings through speaking, listening, and writing. Students also practice proposing new solutions, designing experiments, and testing new ideas as they collaborate with peers.

* Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards was involved in the production of, and does not endorse, this product.

- **Interactive Lessons** teach core science concepts and principles using multiple representations and carefully designed examples and non-examples. Throughout each lesson, students respond actively to novel examples and receive feedback to ensure deep understanding of the concept or principle.
- **Science in the News** is a monthly edition of multilevel science news articles that engage students in exploring recent STEM advancements.
- **Science Videos** show real science in action and serve as virtual field trips that help students visualize science concepts.
- **Unit Nonfiction Books** offer informational text at multiple reading levels across science content areas.
- **Science Fair Resources** include lists of science fair project ideas for students to choose from or use as inspiration for their own research questions.

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**English Language Learning:
Helping Students
with Speaking, Listening,
Reading, and Writing
in English**

English Language Learning: Helping Students with Speaking, Listening, Reading, and Writing in English

Introduction

Teaching English language learners (ELLs) is a complex process that involves scaffolding instruction in speaking, listening, reading, writing, vocabulary, and grammar. For some students, English may be their second or third language, and other ELLs may have limited levels of proficiency in their primary languages.

I. Programs for ELLs

In the United States, almost one in ten K–12 students is an ELL (National Center for Education Statistics [NCES], 2017). ELLs are placed in programs that reflect different philosophies and policies. The most common programs are:

- **Pull-Out/Push-In English as a Second Language:** A language specialist provides specific language support to facilitate student success in mainstream classrooms, or support staff uses a research-based program to assist students' language development.
- **Sheltered or Structured English Immersion (SEI):** ELLs are grouped in a stand-alone classroom for a few hours a day to receive language and academic instruction.
- **Bilingual Instruction:** Students receive academic instruction and language development in both their native and second languages.

II. Academic Language Acquisition

Academic language includes the discourse patterns, grammar, and vocabulary of the task (Anstrom et al., 2010; Scarcella, 2003). For instance, if the task is to read a text which compares and contrasts two concepts, the discourse patterns would address the features and words common to compare-and-contrast writing, the grammar would explain the use of comparatives and adjectives, and the vocabulary would be specific to the two concepts being compared. Academic language implies that students will have opportunities to comprehend and express the complex language required for their grade level (August & Shanahan, 2006).

As noted by Kuhn and Stall (1998, cited in Brandes & McMaster, 2017), incidental vocabulary learning, or learning new words by reading texts that contain those new words, is not an effective way to acquire vocabulary for ELLs because of the possibly limited extent of their existing English vocabulary. Instead, ELLs need strategic and explicit vocabulary instruction.

An effective way of helping ELLs learn academic vocabulary consists of linking new language with what learners already know from their native language (Fillmore & Snow, 2000). For example, pointing out words that are similar in English and other languages (cognates), such as *describir* in Spanish and *describe* in English, is an example of how to build English upon the native language. Comparing affixes is another way. A teacher may point out to native Spanish speakers that the suffix *-tion* has the same function as *-ción* in Spanish, as in *nation*–*nación*, or that *-ty* is the same suffix as *-dad*, as in *liberty*–*libertad*.

III. Speaking

ELLs need to develop oral proficiency in English to be confident and competent in social and academic settings. Effective instruction for ELLs provides ample, meaningful opportunities to use English, along with explicitly teaching English features such as syntax, grammar, vocabulary, pronunciation, and norms of social usage (Goldenberg, 2008, p. 42). The use and development of oral language is particularly important for beginning ELLs in the younger grades, as it serves as one foundation that students use to build early reading skills (Bunch, Kibler, & Pimentel, 2012, p. 3). In intermediate and later grades, oral language proficiency has a close connection with writing proficiency as well (Perin, De La Paz, Worland Piantedosi, & Madigan Percy, 2016).

IV. Listening

For ELLs, listening is an essential skill in a content classroom where students are listening to and processing information in a second or additional language. Preparing ELLs for mainstreaming participation means preparing them for listening to teachers and classmates engaged in academic content (Chamot & O'Malley, 1994, p. 52). For English learners, for whom oral language proficiency plays an important role in acquiring reading skills, active participation by children during teacher read-alouds contributes to vocabulary growth (Calderon, Slavin, & Sanchez, 2011, p. 111).

V. Reading

Reading is a complex skill involving processing, interpreting, and evaluating in order to comprehend written text. For ELLs, reading in English means applying these actions to a new language. ELLs learning to read in English, just like English speakers learning to read in English, benefit from explicit teaching of the components of literacy, such as phonemic awareness, phonics, vocabulary, comprehension, and writing (Goldenberg, 2008, p. 17; Ludwig, Guo, & Georgiou, 2019).

In addition, to become good readers—to be able to recognize words and comprehend text simultaneously—ELLs require practice at both decoding and fluency. Teachers must thus give equal attention to decoding, or word recognition, and comprehension (Calderon et al., 2011, p. 111). When it comes to reading comprehension instruction, curriculums for ELLs need to be implemented at a language level accessible to them (Irujo, n.d.).

VI. Writing

Like first language writing, second language writing develops gradually over time, with considerable variation in individual learners' progress through different stages of development (Bunch et al., 2012, p. 5). When putting ideas into words, ELLs may find it difficult to express themselves because of limited vocabulary and grammar skills, spelling ability, or a lack of confidence using their voices in English.

As with all students, ELLs must be able to move beyond narrative writing and into genres where they must apply academic and content knowledge. Rigorous new standards demand that students show writing proficiency along a series of genres, including argumentative writing, which is a demanding genre that draws on reading, writing, critical thinking, and bringing together information from different sources (Campbell & Filimon, 2018). These heightened expectations for student writing stand in contrast with the majority of writing practice that students receive in elementary schools, which predominantly involves low-level cognitive tasks (Matsumura, Correnti, & Wang, 2015, cited in Campbell & Filimon, 2018).

VII. Vocabulary

The English vocabulary of an ELL can be extensive or minimal depending on the student's background and learning experiences. To help ELLs acquire vocabulary, they must be given numerous opportunities for exposure to and application of words in authentic and varied contexts, with vocabulary instruction that is focused, deliberate, content-based, and visually supported (Irujo, n.d.).

Vocabulary knowledge and strategies for interpreting word meanings are essential for ELLs to perform academic reading and writing tasks. Vocabulary instruction contributes to overall effective instruction by developing students' phonological awareness and reading comprehension (Calderon et al., 2011, p. 110). Studies of vocabulary instruction also show that ELLs are more likely to learn words when they are directly taught, rather than through incidental learning. Just as with English speakers, ELLs learn more words when the words are embedded in meaningful contexts with ample opportunities for their repetition and use, as opposed to looking up dictionary definitions or presenting words in a single sentence (Goldenberg, 2008, p. 17).

VIII. Grammar

Grammar is the structure and function of language, and when ELLs can recognize the structures and functions of English, they can increase their proficiency in speaking, listening, reading, and writing. In order for ELLs to be able to access academic language and content, they need explicit instruction in, and meaningful practice with, English grammar.

Grammatical competence for everyday English includes the accurate use of frequently occurring morphological and syntactic features as well as the functions of these features (Scarcella, 2003, p. 14). Understanding and developing a high level of competence in grammar is the foundation for ELLs to gain access to the demanding texts and tasks required by rigorous academic standards.

Learning A–Z Resources for English Language Learners

Raz-Plus ELL Edition

- **ELL Leveled Reader Packs** are correlated to many leveled books and scaffold reading instruction for ELLs at all levels of language proficiency. The packs build speaking skills in the context of academic content and include multiple opportunities to support students' oral language development.
- **ELL Content Picture Packs** provide opportunities for ELLs to develop their oral language skills with visual supports while working with content-area materials.
- **ELL Vocabulary Power Packs** provide differentiated and structured support to promote the success of ELLs in Grades 3–5 by allowing students to record their reading or responses to questions asked in the text.
- **ELL Vocabulary Books** use content-based themes to support students' social and academic speaking skills. Each lesson provides students with proficiency-leveled dialogue frames that support student engagement. The digital resources allow teachers to assign specific books to students, which they can record themselves reading.
- **ELL Language Skill Packs** provide content-based resources for developing oral skills through vocabulary and guided instruction of key language skills and functions, such as describing, comparing, and classifying.
- **ELL Assessments** monitor and track ELLs' progress in academic language skills, including speaking skills.

Raz-Plus and Reading A–Z

- **Leveled Books** at 29 levels of complexity in projectable, printable, and digital versions allow students to read silently, whisper read, or record their reading using built-in recording tools. The listen versions of eBooks contain continuous-play audio and follow-along highlighted text to model fluency with a natural voice. Projectable versions of the books provide opportunities for labeling, circling, or highlighting nouns, verbs, and other grammar elements.
- **Reading Graphic Organizers** can be used with any book and allow readers to organize ideas, practice talking about what they have read, and develop higher-level thinking skills.
- **Vocabulary Graphic Organizers** provide a framework for learning and discussing new words.
- **Literature Circles** help ELLs practice communication skills as they discuss and collaborate on a single text in small groups.
- **Shared Reading Books** help build ELLs' reading confidence with modeled and choral reading, along with group discussion to promote listening and speaking.
- **Reader's Theater Scripts** are adapted from leveled books and allow students to practice reading aloud material they are familiar with and collaborate with a group for a performance.
- **Content Area Reading Editions** of leveled books engage students with science, social studies, mathematics, art and music, or social stories to introduce academic and domain-specific vocabulary in context.
- **Close Reading Packs** contain short engaging reading passages that drive close reading and both small-group and whole-class discussions.
- **Alphabet Books, High-Frequency Word Books, Fluency Practice Passages, Decodable Books and Phonics Lessons, and Phonological Awareness Lessons** help students become familiar with the sounds of English and provide essential foundational reading skills practice.

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Supporting Exceptional Learners: Methods for Response to Intervention, Special Education, and Gifted Students

Supporting Exceptional Learners: Methods for Response to Intervention, Special Education, and Gifted Students

Introduction

Students who experience difficulties in learning, who show superior performance, or who require a change in instruction or curriculum to help reach their full potential are considered exceptional learners. Exceptional learners are supported academically through methods such as special education services, response to intervention, and gifted and talented programs.

I. Response to Intervention

Response to Intervention (RtI) is a multi-tier framework designed to help and support struggling students. The goal of RtI is to help students maximize achievement so they can perform at the same level as their peers. According to Wisniewski (2013), when used effectively RtI can help students close learning gaps and achieve academic standards.

RtI is implemented using three components: screening, progress monitoring, and multileveled instruction. Multileveled instruction is generally modeled as a three-tier system:

- **Tier 1 (whole class):** High-quality instruction is provided to all students, with about 80 percent of students receiving instruction at this level showing mastery.
- **Tier 2 (small group):** Targeted interventions for students not making progress in Tier 1 that include increasingly intensive instruction depending on group size, frequency, and duration of intervention.
- **Tier 3 (individual student):** Intensive interventions that target the student's skill deficits. Students who do not show adequate progress at this tier are considered for eligibility for special education services under the Individuals with Disabilities Education Improvement Act of 2004.

Within an RtI framework, screening and progress monitoring are used throughout the school year to monitor learning gaps and gains. Guskey and Jung (2011) express how important it is to use the RtI framework properly at each level so students can meet the goals for mastery, which require regular assessment and progress monitoring for students in targeted or intensive intervention. The data from progress monitoring helps direct teachers' decisions about moving students to different tiers.

II. Special Education

An important requirement of any special education program is matching resources to a student's developmental level and providing opportunities for practice with a purpose. To meet this requirement, educators need resources that allow them to easily customize instruction to suit the specific learning needs of every student. Special education is designed to support, instruct, and provide services to students with an individualized education plan (or program, known as IEP) to meet their specific needs. Services for each student may include in-class support with accommodations, with an instructional aide or co-teacher. Some students may need more support and spend part of the day or the whole day receiving modified instruction based on their IEP in a special education classroom. The frequency of assessments depends on student need and academic levels in comparison to grade level, and may be noted in their IEP (Winn & Blanton, 2005).

Student motivation and confidence are vital to making progress for students with learning and other disabilities, yet motivation tends to decrease in the upper elementary grades for these students (Wigfield et al., 2007, as cited in Wehmeyer, Shogren, Toste, & Mahal, 2017). However, teachers can increase student motivation toward reading and writing by allowing students to choose what and when to read, relating reading and writing instruction to students' interests, providing scaffolding and feedback, and creating social groups around reading and writing activities (De Naeghel et al., 2014, as cited in Wehmeyer et al., 2017).

In addition to nurturing motivation, teachers can further facilitate learning by adopting practices that research has found to benefit students with learning disabilities. For example, a meta-analysis by Wood et al. (2018) reported that read-aloud tools such as text-to-speech technology and recorded voiceover significantly enhance reading comprehension in students with reading disabilities. Difficulties decoding text, which are common in students with reading disabilities, also affect reading comprehension by hampering reading accuracy and speed and consuming student's resources (Smythe, 2005, in Wood et al., 2018). Read-aloud tools help students access materials that may be difficult to decode but that align with student interests and listening comprehension skills.

When it comes to learning content, although the focus of science instruction has shifted from reading text to more hands-on activities, students are still expected to read vast amounts of expository scientific text, which may be one of the most challenging reading tasks for students with learning disabilities (Mason & Hedin, 2011, as cited in Kaldenberg, Watt, & Therrien, 2015). A meta-analysis by Kaldenberg et al. found that students with learning disabilities benefit significantly from explicit instruction on vocabulary and from working with graphic organizers when reading science texts, possibly because those supports provide a scaffold to the expository prose found in scientific text.

Learning A–Z Resources to Support Exceptional Learners

Raz-Plus and Reading A–Z

- **Leveled Books** are printable, projectable, and electronic books at 29 levels of text complexity. These leveled books progressively increase in difficulty to help students improve comprehension and fluency. Students can read digital texts at their level, and in their areas of interest, at any time. Leveled Books include an optional Listen eBook version with read-aloud tools that read the text for the student, thus facilitating comprehension even if the student struggles to decode the words.
- **Assessments** provided by Learning A–Z offer teachers resources to measure and track learning gains. Raz-Plus includes a collection of easy-to-use assessment tools for key reading behaviors and foundational skills for progress monitoring, formative assessment, summative assessments, and more.
 - **Alphabet Letter Naming Assessments** help determine students' abilities to name uppercase and lowercase letters.
 - **High-Frequency Words Assessments** measure students' ability to recognize and read high-frequency words, including sight words. Each assessment targets high-frequency words that gradually increase in level of difficulty.
 - **Phonological Awareness** and **Phonics Assessments** help teachers determine whether to focus on onset and rime, rhyme, or syllables; and determine whether students know sound-symbol relations.
- **Incentives** such as **WOWzer printable certificates and electronic and printable badges** can be used anytime to encourage and reward students. Students receive digital stars for successfully completing various assignments and texts they have selected themselves. These stars can be redeemed in the Kids A–Z platform, where students can customize their own online environment or create a personal avatar.

- **Shared Reading Books** support a balanced literacy instructional approach. Teachers use projectable big books while modeling close reading, text-dependent questioning, and strategies for asking and answering questions.
- **Comprehension Skill Packs** give teachers the resources they need for direct and explicit instruction. These standards-based lesson plans provide a three-step approach to instruction—teach, practice, and apply—to help students construct meaning from text.
- **Literature Circles** and **Reader’s Theater Scripts** help create a social community around reading while students collaborate during book discussions or perform a piece of writing.
- **Graphic Books** present informational text in a visually engaging format.

Science A–Z

- **FOCUS Books** cover high-interest science topics at three different reading levels and are available in printable, projectable, and electronic formats.
- **Vocabulary Cards, Game Packs, and Word Work** resources provide multiple ways for students to learn the scientific vocabulary featured in the texts they read.
- **Graphic Organizers** are printable and projectable tools that help students establish connections implicit in scientific texts, distill important information, and process the science texts they read.
- **Quick Reads** are single-page passages in printable and electronic formats that address specific science topics.

Headsprout

- **Headsprout** is an adaptive online program that ensures that beginning readers master foundational skills necessary to be at or above their reading level. The scaffolded program adapts to meet the needs of every student to develop and enhance reading comprehension.
- **Headsprout Fluency Building Packs** provide additional practice for students who need further support in the areas of decoding and oral reading fluency. Additional practice is delivered based on periodic benchmark assessments that identify specific phonetic skills gaps.

Writing A–Z

- **Emergent Writing** and **Process Writing Lessons** help emergent to fluent writers develop their writing skills using printable, projectable, and electronic tools. Students complete activities that develop their skills from writing single words to sentences to compositions.
- With the **Build-A-Book** tool, students draft and publish their own full-length books on any topic of interest—complete with color illustrations.

III. Gifted Learners

Students who show high ability in creative, artistic, or leadership areas, or in specific academic fields, need services to develop their potential which are not ordinarily provided by the school (National Association for Gifted Children, n.d.). Despite this necessity, many schools are unable to successfully address the fact that between 40 and 50 percent of the typical content taught in class is redundant for gifted students (Reis & Purcell, 1993, and Yang & Siegle, 2006, as cited in Callahan, Moon, Oh, Azano, & Hailey, 2015).

Callahan et al. (2015) suggest the following recommendations for adapting the curriculum to gifted learners:

- Increasing the abstractness and complexity of the concepts presented
- Increasing the number of points of view presented about a topic
- Encouraging open-ended problem solving
- Adding critical thinking skills from higher grade levels
- Assigning activities that require student independence
- Accelerating the pace of instruction
- Allowing more student choice about the end product of an activity and the process of reaching that end product.

Learning A–Z Resources to Support Gifted Learners

Raz-Plus and Reading A–Z

- **Leveled Books** are printable, projectable, and electronic books at 29 levels of increasing text complexity. Students can read texts at their level and in their areas of interest at any time.
- **Close Read Passages and Packs** present challenging nonfiction and fiction texts for students to analyze deeply through careful reading and answering open-ended questions.
- **Project-Based Learning Packs** challenge students to work in teams reading multiple texts in order to answer a Driving Question. These packs require students to collaborate, communicate, and use critical thinking throughout the project.
- **Classics** expose students to timeless novels, poetry, and stories more easily by breaking longer texts into manageable parts.
- **Themed Nonfiction Series** provide literacy instruction while focusing on specific nonfiction topics that students can choose based on their interests.

Science A–Z

- **Investigation Packs** are group science activities that help students explore science content in detail as they read high-interest texts and answer a question surrounding a Mystery File.
- **Project-Based Learning Packs** are inquiry-based science projects in which students work in teams to read different passages about a related topic and answer a Driving Question.
- **Interactive Science Lessons** teach difficult scientific concepts through highly visual scenarios that require students to apply scientific concepts and principles. The lessons include audio support and immediate feedback, allowing students to progress independently at their own pace.

Headsprout

- **Headsprout** lets students move at their own pace through the program, ensuring that students meet the criteria for each skill before moving on. Students can use the program independently and progress through the lessons as quickly as their skill level allows.

Writing A–Z

- With the **Build-A-Book** tool, students can draft, edit, illustrate, and publish their own books to the rest of the class, on nearly any topic and genre. With this tool, students write with a sense of purpose and can determine the length of their books, from a single page to multiple chapters.

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