

Using Assistive Technology to Meet Literacy Standards

for Grades 4-6

an IEP Team Guide



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IEP



RESOURCES



Using Assistive Technology to Meet Literacy Standards Win/Mac CD

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INTRODUCTION

GRADES 4-6

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Assistive Technology in the Schools

One of the greatest gifts you can give to a child with a disability is increased independence. The ability to take control of one's life in as many areas as possible—from freedom of movement to freedom of expression—contributes to a child's ability to define herself as an individual. This is the ambition behind the Assistive Technology (AT) initiative and one which can and must be accomplished. As experienced educators, we welcome the opportunity to use AT to move students toward greater autonomy in and out of the classroom.

Even though the application of AT principles in public schools has been federally mandated for over a decade, many districts still struggle to define how it relates to school-based services.

Some of the problem stems from vague terminology—*i.e.*, “assistive” and “technology”—two terms which cover so much ground they can be confusing. For example, while the term “technology” can refer to augmentative communication devices and state-of-the-art computers, it also includes adapted pencils and paper.

In addition, part of the confusion comes from the fact that the definition of AT doesn't originate from an educational model: Instead, it was initially imbedded in federal law; *i.e.*, the Technology-Related Assistance for Individuals with Disabilities Act of 1988. This law broadly addresses the technology issue for all Americans with disabilities in and out of school.

Recently, however, there is a pressing need to define AT solely in the context of public education. With the reauthorization of IDEA '97 came a renewed determination to consider AT needs for all students enrolled in special education. Because of it, school districts must take a closer look at what they are doing to honor its intent. Two major components of the law help to define the role of AT in public education:

1. the legal definition of assistive technology, and
2. the issue of access to the general curriculum.

Today, public schools have come under a new federal mandate called No Child Left Behind (NCLB), that holds schools

accountable for yearly progress of all students, including students with disabilities. As part of this mandate, students with disabilities are required to participate in annual testing to measure progress. It is our view that as NCLB is implemented, the use of assistive technology will be essential to ensure participation for some students with disabilities.

PART I

Legal Definition of Assistive Technology

The law defines AT devices as “any” item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized that is used to increase,

maintain, or improve “functional” capabilities of a child with a disability.

Key words in this definition are “any” and “functional.”

“Any” defines the types of available AT resources broadly, and it makes it clear that the intent isn't just to cover AT equipment that requires electronic components. In fact, our experience in the classroom has indicated that it's often the “low-tech” options which benefit a student the most, because they are often more reliable than a high maintenance electronic system.

School personnel need to be aware of the full array of AT options and to develop a list which may be beneficial to every student who needs them. In addition, school personnel

need to educate parents and other staff members about the broad range of AT options, including low-tech.

While “any” describes the range of available technologies, the term “functional” defines the specific types of equipment required.

To participate in classroom activities students need to see, hear, speak, process information, and use fine and gross motor skills. When a student has a disability in one or more of these areas he may experience barriers to educational performance.

Using Assistive Technology to Meet Literacy Standards, Grades 4-6 is the second book in a series. The first book (Assistive Technology Solutions), covered Kindergarten through Grade 3. This book is a continuation of the same content areas for Reading and English Language Arts for Grades 4-6. The next book in the series (in publication) will complete the series for Grades 7-12.

For example, if a student is nonverbal and the curriculum requires oral communication as part of the performance measure, the student will have difficulties functioning in that skill area. It's the school district's role to evaluate each student to determine where functional skill impairments occur and to provide adaptations and modifications to the fullest extent possible.

PART II

Access to the General Curriculum

One of the fundamental changes in IDEA '97* was the mandate for public education to become more inclusive of all learners. In it, Section 614 states:

An Individualized Education Program (IEP) is a written statement for each child with a disability that includes a statement of the child's present levels of educational performance, including how the child's disability affects the child's involvement and progress in the general curriculum . . .

Special education students have a fundamental right to access the general education curriculum. How we as educators provide that access is the key to their educational success.

AT can provide one avenue to this success. It is the intent of the law that all students participate in the same course of study, regardless of ability. In this educational context, for some students the use of AT resources is essential to meet this mandate.

It should be clear that AT is not about providing a separate curriculum. Rather, it's about giving students who need it access to the general curriculum. Children with disabilities present us with a variety of challenges. For them, learning is modulated through eyes that don't see, ears that don't hear, hands that don't grasp, legs that don't walk, mouths that don't speak, and brains that don't develop normally. Assistive Technology bridges the gap between a child's functional skills and his ability to participate in the educational process (see Fig. 1). It breaks through the barriers associated with vision, hearing, communication, processing, and motor skills and allows students to do the same things as their general education peers.

A distinction needs to be made between instructional and assistive technology. Sometimes referred to as Computer Aided Instruction (CAI), instructional technology includes

* As this book goes to print, IDEA is pending re-authorization. We don't anticipate any fundamental changes to assistive technology issues.

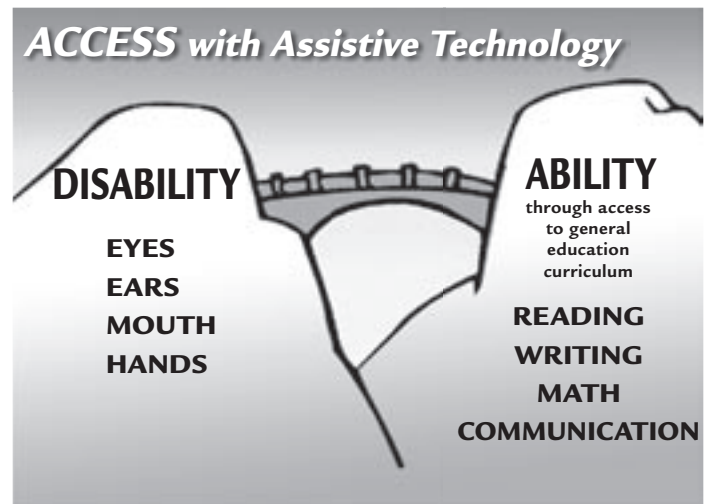


Fig. 1 – AT bridges the gap

software programs that enhance classroom activities. Computer stores have shelves full of these programs which teachers and parents can use to provide students with extra practice and skill development during free time activities. Some of this software touts itself as being grade specific and curriculum based. However, close inspection shows that these programs are often not aligned with state curriculum and shouldn't be used as such. They offer optional instruction and should be used only as supplementary materials.

Assistive differs from instructional technology in that it's not optional. For a student who can't hear, see, or talk, or who requires equipment to move or write, this technology is compulsory. Specialized keyboards and switches provide students with motor access. Augmentative and alternative communication devices give nonverbal students access to expression. Braille writers offer access to the visually impaired, while FM systems provide it for those with hearing impairments. Software that features word prediction, text-to-speech capabilities, and math formatting offer access to those facing learning, processing, and motor barriers. All these AT programs give students access to the same curriculum presented to other members of the class.

ASSISTIVE TECHNOLOGY SOLUTIONS

As school districts come to terms with their obligation to provide access to the general education curriculum for students with special needs, they will need to align AT with the performance requirements of the curriculum. *Using Assistive Technology to Meet Literacy Standards* for IEP Teams was developed with recognition of this growing need and as a result of our experiences in public education.

This book was developed using two basic principles:

1. AT considerations for the classroom are based on a student's need to access the general education curriculum as defined by performance standards.
2. AT considerations do not necessarily require large expenditures.

AT solutions presented in this guide represent changes in materials and instructional strategies. These solutions are built on concepts related to accommodations as defined in IDEA '97: A change in the educational setting, materials or strategies that does not significantly alter the content of the curriculum or level of expectation for students' performance and which allows students to access the general education curriculum.

Solutions are designed to be consistent with the level of performance expected for each curriculum standard. And it covers changes in materials which run the gamut from low-tech to the use of complex electronic devices.

AT Solutions presents a host of assistive technology options that can be chosen for students who experience educational challenges. It emphasizes the low end of the technology spectrum for a variety of reasons:

- First — simple accommodations are readily available and better received in the classroom than more sophisticated adaptations.
- Second — such accommodations are often closer to the “norm” for general education students, and thus less intrusive and better accepted by peers. In other words, these accommodations offer the least restrictive environment for a child.
- Third — schools have limited resources. Cost effective solutions, which assist a child in achieving independence in academic functioning, help meet IDEA '97 regulations for AT consideration.

The AT Solutions guide is built on the Reading/English Language Arts Framework for California Public Schools (1999), a publication of the California Department of Education. During the development of AT Solutions similar frameworks from other states were reviewed. After this comparison, we decided that there were clearly enough similarities in frameworks throughout the country to develop this guide based on the California model.

This book is the second in a series. The first book (Assistive Technology Solutions), covered Kindergarten through Grade 3. This book is a continuation of the same content areas for Reading and English Language Arts for Grades 4-6. The next book in the series (in publication) will complete the series for Grades 7-12.

This guide does not address the needs of students who are deaf or hard of hearing, visually impaired or blind,

or who need specialized seating or mobility. The services of deaf/hard of hearing or vision specialists, or occupational/physical therapists are required to make recommendations for assistive technology items such as hearing aids, Braille writers, wheelchairs, etc. Whereas these types of AT are important aspects of assistive technology, they are beyond the scope of this guide.

It should be noted that we have included solutions for nonverbal students in this guide because of our backgrounds as speech-language pathologists. However, students who are nonverbal also require assistance from their school speech language pathologists, especially when device complexity and design are an issue.

This guide does not specifically address AT needs for students who are severely cognitively impaired. Even though IDEA '97 requires students to have access to general curriculum, there is recognition that some students will need modifications to that curriculum which represent significant changes in instructional level, content and performance. For these students, developmental levels determine curriculum access level. AT solutions for severely cognitively impaired students will be the topic of another guide currently in the developmental stage.

Guide Design

The educational process is one which requires communication and action. Teachers talk and students listen. A student demonstrates knowledge by speaking or performing a task. When a student is nonverbal or has fine motor or processing difficulties, he is at risk for educational failure.

The student population focus for this guide includes students who have mild to moderate cognitive processing impairments, who have fine motor disabilities, and who are nonverbal. Within this population it can be reasonably assumed that curriculum standards can be achieved if accommodations, including assistive technologies, are utilized.

The guide is designed to be “user friendly.” Curriculum standards within each content area are presented in a chart format, which includes:

- the grade and standard,
- an analysis of the access issues related to performance of the standard,
- suggestions for AT solutions,
- sample IEP goals.

The chart example (*Fig. 2*) helps to illustrate the basic format of the manual.

Key Words

This guide is designed around the use of a chart.

The AT Solutions on the chart use *key words*.

The reader is directed to find the *key word* in *Appendix A* for the following information:

- a description of what it is, including an illustrated example for some
- suggestions for how you can make it, if possible
- information on how to buy it, including costs and vendor sources.

In some cases the solutions listed on the chart are inclusive

of a variety of choices a teacher could make for a student. The choice made will depend on the type and severity of the disability which presents as an academic barrier. For example, the student who has mild fine motor difficulties may only need a pencil grip to access writing tasks. A student who has a severe motor disability may require computer access for writing. Sample solutions must be selected with the individual student in mind.

A multi-disciplinary approach is needed when a student has multiple or severe disabilities, including consultation by the speech-language pathologist for a nonverbal student and an occupational or physical therapist for a student with motoric needs.

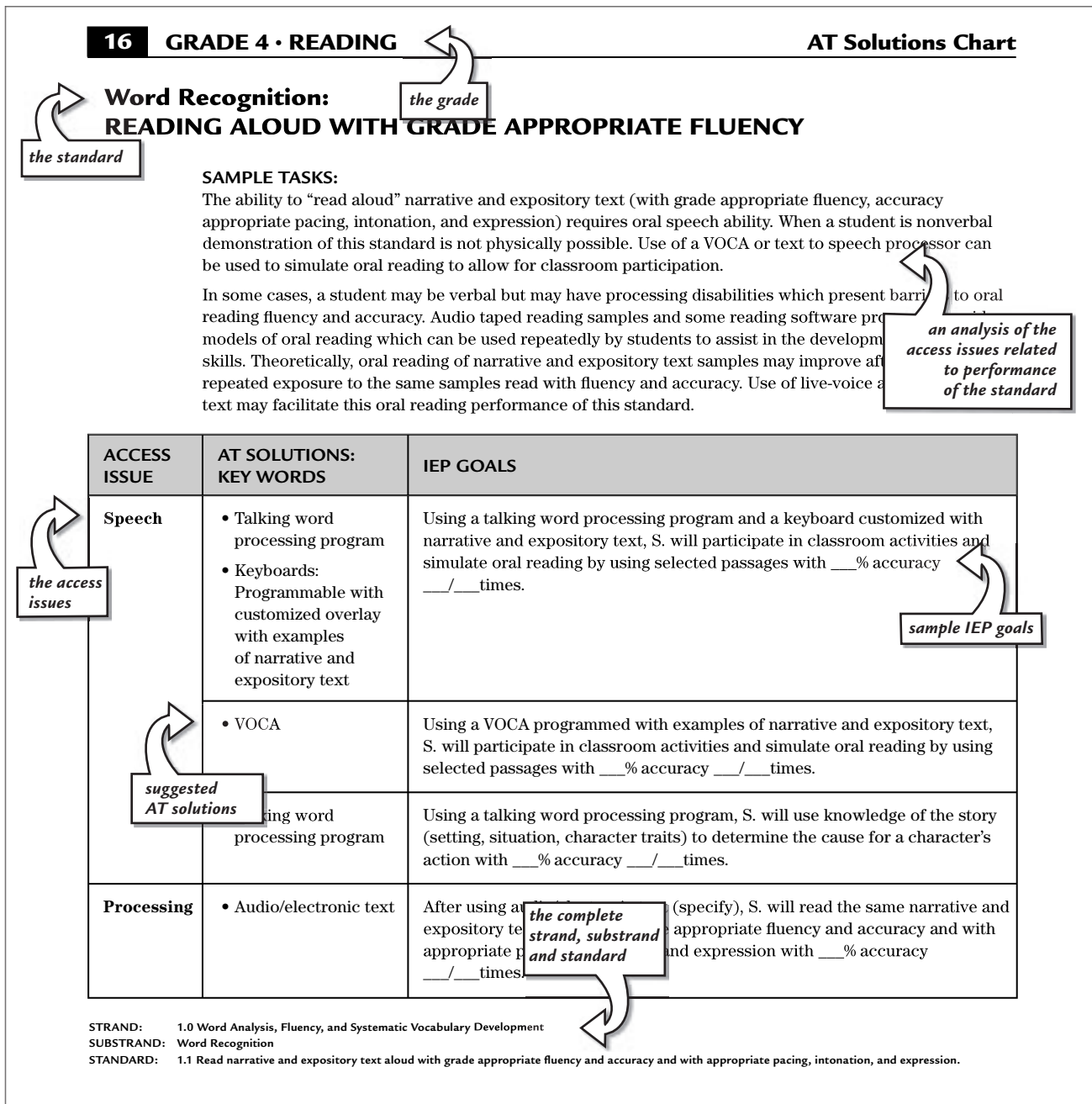


Fig. 2 – Components of an AT Solutions Chart

Standard

Write uppercase and lowercase letters of the alphabet independently, attending to the form and proper spacing of the letters.

AT Solutions Goal

Using adapted/alternative writing implements, S will write uppercase and lowercase letters of the alphabet independently, attending to the form and proper spacing of the letters with ___% accuracy __/___ times.

Fig. 3 – IEP goals where multiple goal components are combined

About IEP Goals

IEP goals which incorporate AT as part of the general education curriculum have three important components:

- AT is written as a “tool” to perform the curriculum standard,
- the curriculum standard is used as the IEP goal,
- all goals conform to IDEA requirements for incremental and criteria based measurements.

The authors have written sample goals to help illustrate how AT might be incorporated into a typical IEP goal.

The general format is: *Using (AT solution), student will (curriculum standard) with ___% accuracy __/___ times.*

Example from worksheet chart illustrated in Fig. 2:

Using a talking word processing program and keyboard customized with narrative and expository text. S will participate in classroom activities and simulate oral reading by using selected passages with ___% accuracy __/___ times.

In this example, a talking word processing program, a programmable keyboard and a VOCA are AT solutions to be used by a child with a motor impairment in order to perform this standard for “Reading Aloud with Grade Appropriate Fluency.”

It is important to note that in some sample IEP goals, depending on the standard which is under consideration, multiple goal components are combined. This was done in the interest of editing space only. A teacher who is considering these goals should break the examples apart in order to have a goal which is measurable according to the multiple components (see Fig. 3).

In this example, there are four components: Uppercase letters, lowercase letters, form, spacing. The teacher who is writing this goal would need to separate uppercase and

lowercase letter production into separate goals depending on the student’s level of performance and couple each with form and then spacing. Examples include:

Using adapted/alternative writing implements, S will write uppercase letters of the alphabet independently, with correct letter form with ___% accuracy __/___ times.

Using adapted/alternative writing implements, S will write lowercase letters of the alphabet independently, with correct letter form with ___% accuracy __/___ times.

Using adapted/alternative writing implements, S will write uppercase letters of the alphabet independently, with proper spacing of the letters with ___% accuracy __/___ times.

Using adapted/alternative writing implements, S will write lowercase letters of the alphabet independently, with proper spacing of the letters with ___% accuracy __/___ times.

2. The AT Solutions sample goals do not have specific accuracy levels or frequency statements. It’s recognized that this information must be supplied by the teacher for each individual student depending on the student’s performance level. Teachers using these examples will need to customize and modify these aspects of goal writing to be student specific.
3. The sample goals will also need to be customized for each student in order to specify benchmark dates. For example, using the AT Solutions goal discussed above, the teacher would need to develop the annual date and measurements for completion of the goal, as well as the interim benchmark dates and measurements.

An example of an overall annual goal written on 6-1-04 for completion by 6-1-05:

By 6-1-05

Using adapted/alternative writing implements, S will write lowercase letters of the alphabet independently with proper spacing of the letters with 90% accuracy 4/5 times

An example of a first incremental goal:

By 12-1-04

Using adapted/alternative writing implements, S will write lowercase letters of the alphabet independently with proper spacing of the letters with 50% accuracy 2/5 times

An example of a second incremental goal:

By 3-1-05

Using adapted/alternative writing implements, S will write lowercase letters of the alphabet independently with proper spacing of the letters with 75% accuracy 3/5 times

4. Use of the AT solutions is not meant to be absolute for any one student with a particular type of disability. Instead, teachers should analyze the student's access needs relative to performance of a standard and apply the AT Solutions creatively in order to best meet the student's needs. Teachers using this guide should read it for the purpose of understanding the logic behind the AT solution suggestions.
5. Teachers will need to write IEP goals to conform to local school district requirements for writing IEPs. The goals are designed to be models for how AT can be integrated with curriculum standards as part of a student's Individualized Education Program.

STEP-BY-STEP HOW TO USE THIS GUIDE

- Identify curriculum standard student can not perform
- Identify the functional access barrier (speech; motor; processing) experienced by the student when trying to perform this standard
- Locate same or similar curriculum standard in this guide
- Match to student's access needs
- Customize suggested solutions to meet the individual student's needs
- Consult with other professionals as needed (*i.e.*, speech-language pathologist for nonverbal student; OT or PT for motor needs; vision and hearing specialist for vision and hearing needs)
- Modify suggested goals for incremental dates, accuracy and frequency according to individual student performance levels
- Use **Appendix A** for information about AT solutions (definitions, strategies, instructions for making or purchasing)
- Use **Appendix B** for vendor information
- Use **Appendix C** for additional web site information
- Use **Appendix D** for information from IDEA '97

Helpful Hints

HINT #1:

We recommended that you familiarize yourself with the key words at the beginning of **Appendix A** as the first orientation to the guide. These key words are used uniformly in the worksheets throughout the guide to refer to the various AT options which may be appropriate for performance of the curriculum standards. By starting with a review of these keywords the reader will have an idea of how **Appendix A** is related to the worksheets for AT solution suggestions.

HINT #2:

A frequent goal statement in the AT Solution guide reads as follows:

Using selection mode (specify) and display strategy and system (specify) . . .

These AT solution key words are linked together throughout the guide and explained in detail in Appendix A:

- selection mode
- display strategy
- display system

When these solutions are suggested the following information will be helpful:

1. Determine the student's best selection mode for the task. (Information in Appendix A fully describes the various selection modes as yes-no; pointing; writing; or scanning.) Communication systems are built around objects, pictures, or printed words which a student selects to demonstrate knowledge for a particular task. The mode selected by the teacher will vary with the task and with the student's abilities.

2. Be specific about which selection mode the student will use for the task in the goal:

Using selection mode (specify) . . .

If the best selection mode for the student for the task is pointing, the goal would be written as:

"Using pointing . . ."

3. Determine which display strategy and system will be used for the task. Be specific about which display strategy and system the student will use for the task in the goal which is developed for the student. (Information in Appendix A fully describes "display strategy" and "display system" (types).

Display strategies are related to the number of items to be displayed and to how the items are arranged. Display systems are related to the various types of displays (Velcro; boards; eye gaze frames). The display strategy and system selected for any one student will vary depending on the task and the student's level of functioning.

For example, if the task can be accomplished using pictures, and the student can discriminate given a choice of two, the goal (continued from above) would now be written as, "*Using pointing and two picture cards placed on a table, S will . . .*"

GETTING TO WORK

The next 200 pages are Assistive Technology worksheets. These are the nerve center of this guide.

As you move through this part of the guide, you may want to refer back to this introduction frequently until the use of the worksheets becomes clear.

Again, one of the greatest gifts you can give a student with a disability is access to independence in his classroom relative to his capabilities. *Using Assistive Technology to Meet Literacy Standards* will help you realize this goal for all of your students and to achieve AT compliance under IDEA '97.

CHAPTER

2

Curriculum Focus:

READING

GRADES 4-6

**WORD ANALYSIS, FLUENCY AND
SYSTEMIC VOCABULARY DEVELOPMENT****GRADES**

Word Recognition 4, 5, 6

Vocabulary and Concept Development 4, 5, 6

READING COMPREHENSION

Structural Features of Informational Materials 4, 5, 6

Comprehension and Analysis of Grade-Level-Appropriate Text 4, 5, 6

Expository Critique 5, 6

LITERARY RESPONSE AND ANALYSIS

Structural Features of Literature 4, 5, 6

Narrative Analysis of Grade-Level-Appropriate Text 4, 5, 6

Literary Criticism 5, 6

GRADE

4

Curriculum Focus:
READING

GRADE 4

WORD ANALYSIS, FLUENCY AND SYSTEMIC VOCABULARY DEVELOPMENT

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GRADE

4

Word Recognition: READING ALOUD WITH GRADE APPROPRIATE FLUENCY

SAMPLE TASKS:

The ability to “read aloud” narrative and expository text (with grade appropriate fluency, accuracy, appropriate pacing, intonation and expression) requires oral speech ability. When a student is nonverbal demonstration of this standard is not physically possible. Use of a VOCA or text to speech processor can simulate oral reading to allow for classroom participation.

In some cases, a student may be verbal but may have processing disabilities which present barriers to oral reading fluency and accuracy. Audio taped reading samples and some reading software programs provide models of oral reading which can be used repeatedly by students to assist in the development of these skills. Theoretically, oral reading of narrative and expository text samples may improve after a student has repeated exposure to the same samples read with fluency and accuracy. Use of live-voice audio or digitized text may facilitate the oral reading performance of this standard.

ACCESS ISSUE	AT SOLUTIONS: KEY WORDS	IEP GOALS
Speech	<ul style="list-style-type: none"> Talking word processing program Keyboards: Programmable with customized overlay with examples of narrative and expository text 	Using a talking word processing program and a keyboard customized with narrative and expository text, S will participate in classroom activities and simulate oral reading by using selected passages with ___% accuracy ___/___times.
	<ul style="list-style-type: none"> VOCA 	Using a VOCA programmed with examples of narrative and expository text, S will participate in classroom activities and simulate oral reading by using selected passages with ___% accuracy ___/___times.
	<ul style="list-style-type: none"> Talking word processing program 	Using a talking word processing program, S will use knowledge of the story (setting, situation, character traits) to determine the cause for a character's action with ___% accuracy ___/___times.
Processing	<ul style="list-style-type: none"> Audio/electronic text 	After using audio/electronic text (specify), S will read the same narrative and expository text aloud with grade appropriate fluency and accuracy and with appropriate pacing, intonation, and expression with ___% accuracy ___/___times.

STRAND: 1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

SUBSTRAND: Word Recognition

STANDARD: 1.1 Read narrative and expository text aloud with grade appropriate fluency and accuracy and with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development: APPLY KNOWLEDGE OF WORD ORIGINS TO DETERMINE MEANING

SAMPLE TASKS:

A typical task for this standard would involve use of a dictionary or thesaurus to analyze and apply root word and derivational knowledge in order to understand the meanings of single words (including synonyms, antonyms) as well as idiomatic expressions.

A student needs to be able to read and to manipulate dictionaries and other reference materials in order to independently explore vocabulary meanings and concepts. If a student is unable to use a standard dictionary because of a motor and/or processing disability, various text alternatives (including dictionaries in electronic formats with or without text-to-speech options) offer solutions to the performance of this reading task.

ACCESS ISSUE	AT SOLUTIONS: KEY WORDS	IEP GOALS
Motor	<ul style="list-style-type: none"> • Book holder • Page turner 	Using book holder, page turner and standard dictionary, S will read and understand word origins, derivations, synonyms, antonyms, and idioms with ___% accuracy ___/___times.
	<ul style="list-style-type: none"> • Selection mode • Word processing program (with dictionary and thesaurus) • Keyboard/keyguard • Mouse alternatives 	Using a selection mode (specify) and word processing program (with dictionary and thesaurus), keyboard (specify), and/or mouse (specify), S will read and understand word origins, derivations, synonyms, antonyms, and idioms with ___% accuracy ___/___times.
Processing	<ul style="list-style-type: none"> • Dictionary/Thesaurus (electronic) 	Using an electronic dictionary/thesaurus, S will read and understand word origins, derivations, synonyms, antonyms, and idioms with ___% accuracy ___/___times.

STRAND: 1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

SUBSTRAND: Vocabulary and Concept Development

STANDARD: 1.2 Apply knowledge of word origins, derivations, synonyms, antonyms, and idioms to determine the meaning of words and phrases.

Vocabulary and Concept Development: USE KNOWLEDGE OF ROOT WORDS TO DETERMINE WORD MEANING

SAMPLE TASKS:

A typical task for this standard would involve use of a dictionary to analyze and apply root word knowledge in order to understand the meanings of unknown words.

A student needs to be able to read and to manipulate dictionaries and other reference materials in order to independently explore vocabulary meanings and concepts. If a student is unable to use a standard dictionary because of a motor and/or processing disability, various text alternatives (including dictionaries in electronic formats with or without text-to-speech options) offer solutions to the performance of this reading task.

ACCESS ISSUE	AT SOLUTIONS: KEY WORDS	IEP GOALS
Motor	<ul style="list-style-type: none"> • Book holder • Page turner 	Using book holder, page-turner and standard dictionary, S will read and understand unknown words within a passage with ___% accuracy ___/___times.
	<ul style="list-style-type: none"> • Selection mode • Text alternatives • Dictionary/Thesaurus (software) • Keyboard/keyguard • Mouse alternatives 	Using a selection mode (specify), text alternatives (specify), dictionary software, keyboard (specify), and/or mouse (specify), S will read and understand unknown words within a passage with ___% accuracy ___/___times.
Processing	<ul style="list-style-type: none"> • Dictionary/Thesaurus (electronic) 	Using an electronic dictionary, S will read and understand unknown words within a passage with ___% accuracy ___/___times.

STRAND: 1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

SUBSTRAND: Vocabulary and Concept Development

STANDARD: 1.3 Use knowledge of root words to determine the meaning of unknown words within a passage.