

Bridges To Reading  
SECOND EDITION

New  
Technologies  
Added!

# Assistive Technology for Children with Learning Difficulties



## Note To Our Readers:

Educational and medical specialists use a variety of terms to refer to learning problems, including **learning disabilities**, **learning difficulties**, **learning disorders** and **learning differences**. These terms are used interchangeably throughout this guide. However, the term “**learning disabilities**” is a professional and legal definition referring to disorders that are believed to be due to central nervous system dysfunction.

Developed by The Frostig Center, *Assistive Technology for Children with Learning Difficulties* was underwritten by the Schwab Foundation for Learning, a nonprofit foundation dedicated to improving the lives of students with learning differences.

## How this Guide was Compiled

This guide is based upon eight years of research conducted by the Trafford Center on Technology and Learning Disabilities at the Frostig Center in Pasadena, California. Information has also been drawn from the authors’ previously published articles and research studies. Research funding has been provided by the Schwab Foundation for Learning, the Mufasa Trust and the U.S. Department of Education.

This guide is part of **Bridges To Reading**,™ a comprehensive kit full of step-by-step strategies to identify, understand and address children’s reading problems. If you wish to purchase a kit, or for more information, call 1-800-230-0988.



Printed on recycled paper

# Assistive Technology for Children with Learning Difficulties






This guide was prepared by the Frostig Center in Pasadena, California, which is devoted to children with learning disabilities. Marshall Raskind, Ph.D., Director of Research of the Center, was the project director and primary author. Dr. Raskind is an authority on technology and learning disabilities.

The author would like to thank Tobey Shaw, Dr. Nora Slaff, Dr. Eleanor Higgins, Dr. Bennett Ross and Dr. Roberta Goldberg for their assistance in the development of this guide.

# Contents



What Is Assistive Technology? .....	4
Why Use Assistive Technology? .....	5
Types of Assistive Technology .....	6
Written Language Technologies .....	7
Reading Technologies .....	10
Listening Technologies .....	12
Organization/Memory Technologies .....	13
Math Technologies .....	13
Selecting the Best Technology for Your Child .....	14
Cost .....	17
Closing Comments .....	19
 Steps to Success .....	20
 Frequently-Asked Questions .....	21
 Resources .....	23



“Man is still the most extraordinary computer of all.”  
—John F. Kennedy



## What Is Assistive Technology?

**A**ssistive technology can be defined as **any item, piece of equipment or system that helps people bypass, work around or compensate for learning difficulties.** Assistive technology is an umbrella term, which can be divided into two main groups: hardware and software. **Hardware** refers to actual equipment. For example, tape recorders and calculators are two common types of hardware. On a computer, the hardware includes the central processing unit (the computer’s “box”), the monitor (the screen) and the internal circuit boards. **Software**, on the other hand, refers to the programs that run on computers, telling the computers what to do.

The purpose of assistive technology is to work around specific deficits, rather than fixing them. It helps people with learning differences reach their full potential and live satisfying, rewarding lives. Assistive technology, however, should be a part of an overall program to help individuals with learning differences.

Examples of assistive technology include “hi-tech” items, such as reading machines that read books out loud through a computerized voice to help persons with reading difficulties. Speech recognition systems also

belong to the hi-tech group. These systems allow the user to write stories by talking to a computer, rather than having to write the words out by hand. “Low-tech” devices include more common, inexpensive tools. For example, tape recorders enable individuals with memory or listening difficulties to permanently capture spoken information. Both types of assistive technology make life easier for persons with learning differences by allowing them to gather information and express their own ideas using the method that works best for them.

Many people confuse assistive technology with instructional software. As mentioned earlier, assistive technology is used to **bypass, work around** or **compensate** for learning difficulties. Instructional software, on the other hand, is designed to develop or improve specific skills in such areas as reading, writing or math. Assistive technology is not designed to improve particular skills or teach particular subjects. Instead, it provides a means for the user to work around the learning differences. This guide does not discuss instructional software, as that market is vast and ever-changing. The contents of this guide focus on the specific topic of assistive technology.

**Assistive technology helps people work around problems by focusing on their strengths, rather than their weaknesses.**

## Why Use Assistive Technology?

Learning disabilities are **professionally diagnosed** learning difficulties—with reading, writing, speaking, listening, spelling, reasoning or math—that are the result of a presumed central nervous system dysfunction. Learning disabilities are neither cured nor outgrown. Children with learning differences grow up to be adults with learning differences. However, with hard work and helpful tools, children with learning differences can greatly improve their success in these areas. Assistive technology is one such tool.

**With hard work and helpful tools, children with learning differences can greatly improve their chances of success.**

Although we tend to think of learning differences in terms of the school setting, individuals with learning differences must also function at home, in the workplace, at social gatherings and in recreational activities. Easily portable tools—many of which are pocket-sized—allow individuals to bring a bypass strategy into many different settings. Now a person with a learning difference can write a letter to a friend at home on a word processor. He can check for spelling errors at the library with an electronic spell checker, or keep score in a card game at a friend’s house with a calculator. Assistive technology provides support to “get the job done.”

Finally, assistive technology helps increase the independence of persons with learning differences. Many times, these individuals rely on parents, siblings, friends and teachers for help. Yet over-reliance on others may slow the transition into adulthood. It may also lower self-esteem, as it requires persons with learning differences to depend on others, rather than themselves, to solve a problem. Assistive technology provides a means for people with learning differences to accomplish specific tasks on their own.

## Types of Assistive Technology

It is important to understand that not all technologies are appropriate for all individuals. People have their own unique set of strengths, weaknesses, interests, experiences and special abilities. Therefore, a technology that may be a blessing for one person may be useless for another. Similarly, a technology that is appropriate for one purpose in a particular setting may be of little value in another situation. So, when choosing an assistive technology, consider the specific individual, the setting and the task(s) to be performed.



See comparative chart inside back cover.



The following section describes technologies that may help individuals with learning differences compensate for their problems. Technologies appear under general headings according to the main area of difficulty. Some technologies may appear under more than one heading, since they may be useful for more than one area of difficulty.

## Written Language Technologies

Word processors are computer-based writing systems that enable the user to type text onto a computer screen before printing on paper. In this way, the user can easily remove or add words, move sentences, and correct punctuation and spelling. Text is also easily underlined, boldfaced or centered. The ability to rearrange text in these ways may help reduce a writer's fear of making errors, since the text can be changed easily. This frees the user to focus on what she wants to express, rather than on making the paper error-free. She can be confident that her efforts will result in a neat, clean and presentable document—something she can feel proud of.

**Spell checkers** are part of most word processing programs. They are also available as stand-alone desktop and pocket-size tools. Those attached to word processors scan a written document, show the user (usually by visually highlighting the word) any misspelled words, and offer a list of suggestions for the correctly-spelled word. Stand-alone spell checkers require users to enter the word (the way they think it is spelled) on a small keyboard. Some devices will simply verify and correct the spelling on a small screen; others offer a complete dictionary and thesaurus. Other devices actually “speak” the words by means of a speech synthesizer, allowing the user to hear as well as see text. (See “speech synthesizers” below.)

However, spell checkers do have limitations. For example, when two words sound the same but have different meanings (such as “there” and

**Word processors free the user to focus on what she wants to express, rather than on making the paper error-free.**



“their”), the spell checker does not indicate when the wrong word/spelling has been used. Additionally, spell checkers often do not recognize the misspellings of persons with learning difficulties and are unable to offer suggestions for the correct spelling of a word.

**Proofreading** programs are sometimes called “grammar checkers” as well. They are used in combination with word processing programs to check for errors in grammar, punctuation, capitalization and word usage. Suspected errors are identified on the computer monitor, and the user is given a chance to correct them before printing the document. Unfortunately, many proofreading programs are not completely accurate; they may miss a number of errors. They may also prompt the user to change parts of the text that were not incorrect.



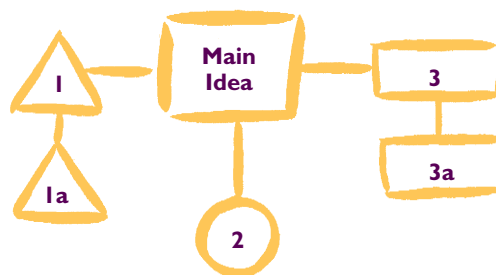
**Speech synthesizers**, together with **screen review** software, enable the user to hear text on a computer screen spoken aloud. Words are spoken in a computerized or “synthetic” voice through a sound card installed either inside or outside the computer. Users can review text they have written by reading it on the computer screen while, at the same time, hearing the words spoken aloud. Hearing the text may help persons catch writing errors—such as problems with grammar, or words that have been left out—that they might not have noticed by reading it. Listening to text may also help users determine if their writing makes sense, and if it really means what they are trying to say. Speech synthesis is especially helpful to those who are better listeners than readers.

**Speech recognition** systems allow a person to operate a computer by speaking to it. In combination with a word processor, the user dictates to the system through a microphone. The spoken words then appear as text on the computer screen. There are two basic types of systems: discrete and continuous speech. Discrete systems require a short pause of approximately 1/10 of a second between words. Continuous speech systems allow the user to dictate without pausing between words. If speech

recognition systems incorrectly recognize a word, the user can choose the correct word from a list of similar sounding words displayed on the screen. The more the system is used, the better it becomes at recognizing the user's spoken language. Speech recognition systems may be most helpful to persons whose oral language abilities are stronger than their written language abilities.

**Outlining** programs, which are now included as part of many word processing programs, help the user create outlines. With just a few simple key strokes (or clicks with the mouse), the program automatically creates Roman numerals for major headings, and letters and numbers for minor headings. If the user decides to move text around, the program reorganizes the Roman numerals, letters and numbers for the headings. Users are free to “dump” their ideas on the computer screen without worrying about order, levels of importance or categories, because the text can be easily moved (and automatically reorganized) at a later time. These programs may be of value to individuals who have great ideas in their heads, but have difficulty getting them down on paper.

**Brain storming/Mind mapping** programs enable writers to create a diagram of their ideas before writing an outline. First, the user types a main idea into the computer. That idea is displayed on the computer screen. Then the user types in related ideas that appear in different shapes—such as circles, ovals or rectangles—surrounding the main idea. Ideas can be linked with the main idea, or with each other, by lines. Ideas are easily moved and placed into different groups. After the diagram is completed, it can be changed to an outline automatically. This “free-form” graphic approach can be quite helpful to individuals who find it difficult to express their ideas in writing.



**Speech synthesis is especially helpful to those who are better listeners than readers.**

**Word prediction** programs work together with word processors. These programs predict the word a person wants to enter into the computer. The person types the first letter of a word, and the program offers a list of words beginning with that letter. If the desired word appears, it can be chosen from the list by pressing the number on the keyboard that is displayed next to that word—or by pointing and clicking with the mouse. That word will automatically insert into the sentence. If the desired word does not appear on the list, the user continues to type the next letter until it does appear. After the user chooses a word, the computer predicts the next word in the sentence. Again, it offers a list of possible words, even before the first letter is typed. Predictions are based upon the sentence content and spelling, as well as the number of times a word is used. Word prediction may be helpful to individuals who have problems with keyboarding, spelling or grammar. These programs may also assist people who struggle to come up with the exact word they want to use in a sentence.

**Alternative keyboards** allow the user to customize the keyboard by changing the layout and appearance of the keys. For example, in the standard position, the top row (of the alphabetic keys) starts with Q-W-E-R-T-Y. Alternative keyboards allow users to create their own order. For example, you can change the keys to go in alphabetical order, A-B-C-D-E-F. The letters can also be made larger in size. Specific options depend on the particular product. Individuals who have difficulty typing may find these devices helpful.



## Reading Technologies

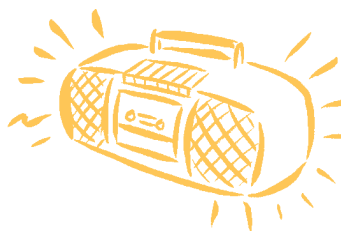
**Optical character recognition** (OCR) systems, when combined with speech synthesis, might be thought of as reading machines. (Please see “Speech Synthesizers” in the previous section for more information.) The OCR enables the user to input hard copy text, such as books and letters, directly into a computer. The computer—or, more specifically, the speech synthesizer – reads the text back out loud. In this way, the individual can hear as well as see the text.

The OCR works with a scanner. The scanner reads images and text from the printed page. Next, it inputs the information into a computer file, and then onto a computer screen. The OCR changes the printed text from the scanner into computer/electronic text. OCR systems are available as self-contained units, which act solely as reading machines, or as systems which work together with personal computers. OCR systems are particularly helpful to persons who have difficulty reading printed words, and those who can better understand what they hear than what they read.

In addition to computer-based OCR systems, fully portable pocket-sized “reading pens” are also available. These battery-operated devices use a miniaturized optical scanning system which enables the user to scan single words on a page (for example, in a textbook or magazine) and have the word read aloud by means of a built-in speech synthesizer.

**Speech synthesis/Screen review** systems may also serve as a reading machine, separate from an OCR system, if the text is available on a computer disk. (Please see “Speech Synthesizers” in the previous section.) Several agencies, including the American Printing House for the Blind and Recordings for the Blind and Dyslexic (RFB&D), have begun producing electronic text, also known as books-on-disk. These can be loaded directly into a computer (bypassing the OCR) and then read back by a speech synthesis/screen review system.

**Tape recorders** can be used to play audio-taped text. Persons with reading differences can work around their problems by listening to recorded text (books, journals, newspapers), rather than reading it. Taped text, such as books-on-tape, is available from many different sources—ranging from toy and record stores to the Library of Congress National Library for the Blind and Physically Handicapped, and RFB&D. Most public libraries



**Word prediction may be helpful to individuals who have problems with keyboarding, spelling or grammar.**

**Variable speech control tape recorders may be quite useful for persons who understand spoken language better when the material is presented at a slower pace.**

and many book stores also carry books-on-tape. Organizations offering audiotaped text generally require verification of a learning disability from a qualified professional. Keep in mind that not all audiotapes work on all tape recorders; they may have varying speeds (1 7/8 ips, 15/16 ips) and formats (two-track, four-track). So check to be sure that the tapes will work with your playback unit.

**Variable speech control (VSC)** tape recorders enable the listener to play audiotaped text faster or slower than it was originally recorded, without losing the actual sounds of the words. This feature may be quite useful for persons who understand spoken language better when the material is presented at a slower pace. On the other hand, some individuals find that they can review material faster by speeding up the tape. VSC tape recorders typically allow listeners to slow down the original recording speed by 25% and increase the playback speed up to 100%.

## Listening Technologies

**Personal FM listening** systems bring a speaker's voice directly into a listener's ear by means of a small transmitter unit (with a microphone), and an equally small receiver unit (with a head- or ear-phone). These wireless systems make the speaker's voice sound stronger, which benefits those who have difficulty focusing on what a speaker is saying. A dial on the receiver unit controls the volume.

**Tape recorders** are used to capture spoken information, such as a teacher's instructions or a classroom lecture. This permanent record allows people to refer back to an oral presentation. People who have difficulty processing, understanding or remembering what they hear may find this helpful. VSC tape recorders may be particularly helpful, since they allow the user to slow down or speed up the recording.

## Organization/ Memory Technologies



**Personal data managers** are available as software packages for a computer or as electronic hand-held devices. They may be useful to persons with organizational or memory difficulties. These managers provide a way to store and retrieve large amounts of personal information easily. For example, a user could keep phone numbers, addresses, important dates, appointments and reminders in a personal data manager. The person enters information on a keyboard, keypad or a stylus, and retrieves information the same way. The information is then displayed on a computer monitor or small liquid crystal display (LCD). Features and capabilities vary considerably. Some hand-held units permit the exchange of information between the device and a computer. Additionally, selected hand-held units allow the user to enter and retrieve information by speaking into the device. Stored information is spoken back in the user's own voice.

**Free-form databases** are software programs that enable the user to type notes into the computer in much the same way as he might write them down on a piece of paper. The note is displayed on the computer screen and can be stored in the computer's memory. Specific notes are retrieved by typing in any piece of information contained in the note. For example, "Mike," "birth" or "Dec." could be used to retrieve the note, "Mike's birthday is on December 8." Such systems may be helpful to those persons who have difficulty organizing and remembering important information.

## Math Technologies

**Talking calculators** use a built-in speech synthesizer to speak number, symbol or operation keys as they are pressed. They also read back

**Choosing the right product depends upon the individual child, the specific setting and the particular task(s) to be accomplished.**

answers from completed calculations. Hearing the numbers or symbols may help some people find input errors, such as pressing the wrong key. Also, hearing the answer aloud helps users double-check for errors that may have been made when copying numbers, such as transposing 91 for 19, or confusing a 6 with a 9.

**Electronic math worksheets** can help the user organize, align and navigate through basic math problems on a computer screen. Addition, subtraction, multiplication and division problems are entered via keyboard or mouse and automatically aligned to the correct vertical format. Numbers on the screen can be read aloud by means of a speech synthesizer. These software programs may be helpful for individuals who have difficulty organizing and aligning math problems with pencil and paper.



## Selecting the Best Technology for Your Child

Every day, more and more technology enters the marketplace. It seems as if every time we turn around, we hear of a new product “that we just can’t live without.” The vast number of new products makes it very difficult to find the best one for your child. Unfortunately, there is no simple rule for selecting the appropriate technology. Choosing the right product depends upon the individual child, the specific setting and the particular task(s) to be accomplished. A tool that may be appropriate for one child in one place may not be helpful for another child in a different place.

Although there is no magic formula for selecting the right tools for your child, the following guidelines may help you find your way through the maze of technology.



- **Determine your child’s specific difficulty.** Do you need an assistive technology that will bypass a reading disability—for example, difficulty decoding words? Do you need a technology that helps with a writing difficulty, such as problems with grammar? Or do you need a technology that compensates for a memory problem, such as not remembering spoken information?
- **Identify your child’s strengths.** Remember, assistive technology works not only because it bypasses weaknesses, but also because it takes advantage of a child’s strengths. For instance, a child who has difficulty reading printed words, but who easily understands spoken words, might benefit from an OCR/speech synthesis system that changes printed words to computerized speech.
- **Include your child in the selection process.** Your child is the one who is going to use—or not use—the technology! Consider your child’s present knowledge of and interest in technology, as well as the particular tool you are considering purchasing. Some experimenting, either through the loan of equipment or through trial periods before purchase, may be necessary.
- **Narrow down the types of technology that might be helpful, based on your child’s strengths and weaknesses.** Do not buy a technology just because it looks good. Technology can be quite impressive, with all its electronic bells and whistles, but not necessarily helpful to your child.
- **Examine the specific settings where the technology will be used.** Will it be used at home, at school, at work or in social settings? The right technology in one setting may be entirely wrong in another. For example, although a computerized voice might be fine for reviewing technical information, an audiotope with a human voice might be better for listening to *Oliver Twist* at home. Consider

**Remember, assistive technology works not only because it bypasses weaknesses, but also because it takes advantage of a child’s strengths.**

**The success of assistive technology often depends on having a good technical support system nearby.**

where, specifically, your child will use the technology. Where is the best place to put the technology? How will you store it? Do you have the right furniture on which to place it?

- **Think about portability when selecting assistive technology.**

Will it be necessary to use the technology in different places? How easy will it be to move from place to place? Fortunately, hand-held and pocket-sized tools are often

as useful as the larger systems. A pocket-sized spell-checker may work just as well as a computer with a spell check program, and it is much easier to move around.

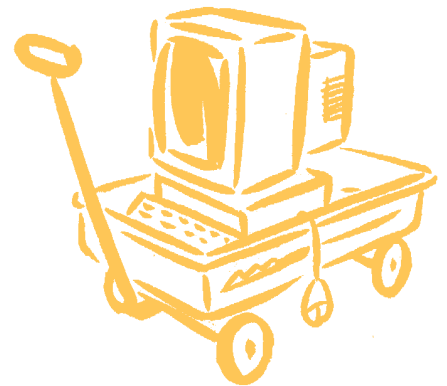
- **Select technologies that work together.**

A speech recognition system that does not work with your present computer, for example, can be frustrating and expensive.

- **Choose technologies that are easy to learn and operate.** This will help your child build confidence in using the tools and in realizing their benefits. The commands for operating the technology should be clear and simple; they should have a direct connection to the functions they perform.

Experiment with a technology through such sources as assistive technology centers or conferences, schools and universities, computer shows, learning disability conferences, retail outlets, and friends. Most manufacturers are willing to provide demonstrations. Some will even loan the technology on a trial basis.

Whenever possible, choose technologies with on-line help systems. Avoid instructional manuals with difficult, technical words. Manuals



should be easy to read and understand. Supporting documentation should be presented in brief, clear sections. They should include the following information:

1. setting up and installing the technology (with clearly defined and logical step-by-step processes)
  2. basic and advanced operating instructions
  3. what to do when things go wrong
- **Select products that offer on-line and toll-free technical support (1-800 numbers), readily-available field representatives, and convenient service locations.** Even with the best of documentation, you might need technical support from the manufacturer or product representative. Also consider the length, cost and limitations of product warranties.
  - **Research the reliability of the product.** Is the technology reliable, or is it always breaking down? Does it require a lot of repairs? Is it a high maintenance product? How long is the product supposed to be useful? Talk with past and present users.
  - **Consider your personal technical support network.** The success of assistive technology often depends on having a good technical support system nearby. This network may include any friends, teachers and family members who have a working knowledge of the product.

**Before buying a product, try it out. Experiment!**

## Cost

The cost of assistive technology varies widely, ranging from as little as \$15 for a low-end personal data manager, to as much as \$3,000 for an optical character recognition (OCR) system. Fortunately, the costs of many assistive technologies have been decreasing. A few years ago, for example, speech recognition systems (without the computer) cost approximately \$1,900. Today these systems cost under \$100!

**Fortunately, the costs of many assistive technologies have been decreasing.**

In some cases the required technology may be too expensive to purchase. A “low-tech” or “no-tech” tool or strategy may work just as well. For example, books-on-tape may work as well as an expensive OCR system.

There is no widespread financial assistance available for purchasing assistive technology. Resources available to help offset the costs are limited. For children with professional diagnoses of learning disabilities, the Individuals with Disabilities Education Act (IDEA) requires elementary and secondary schools to provide assistive technology when two conditions are met:

1. an education professional deems it necessary, and
2. the technology is written into the child’s Individual Education Plan (IEP)—every child in Special Education receives an IEP.

Medicare, Medicaid and private insurance may help finance technologies that serve medical rather than educational purposes. These insurers only consider technologies prescribed by a physician or other licensed practitioner, such as a licensed speech and language pathologist.

In some cases, postsecondary schools may provide assistive technology to students with diagnosed learning disabilities. Under the Rehabilitation Act of 1973, postsecondary schools must provide a specific technology when an education professional prescribes the technology as the only viable solution to ensure students’ full access to the institution. Some postsecondary institutions have set up assistive technology programs on campus. State departments of rehabilitation may also provide assistive technology funding for their clients with learning disabilities. Funding is handled on a case-by-case basis. Specific funding requirements varying widely between state agencies and district offices. However, in order to qualify for funding, the person must have received a professional diagnosis of a specific learning disability.

The Rehabilitation Act of 1973 and the Americans with Disabilities Act state that employers have a legal obligation to provide reasonable accommodations to individuals with disabilities. Once again, whether or not an institution, agency or employer is required to purchase technology for an individual with a learning disability is handled on a case-by-case basis.

### Closing Comments

We are fortunate to live in an age with so many useful tools available to help persons with learning differences. But choosing the “best” technology for a child requires some time and patience. As you will recall, the right product depends upon the individual child, the setting in which it will be used and the task(s) to be accomplished. The more informed you are, and the more you involve your child in the process, the better your chance for success. The last section, “Resources,” lists organizations which can provide you with additional information.

Assistive technology cannot fix or eliminate learning difficulties. However, by learning to capitalize on their strengths and bypass their weaknesses, individuals with learning differences can lead satisfying, successful lives.



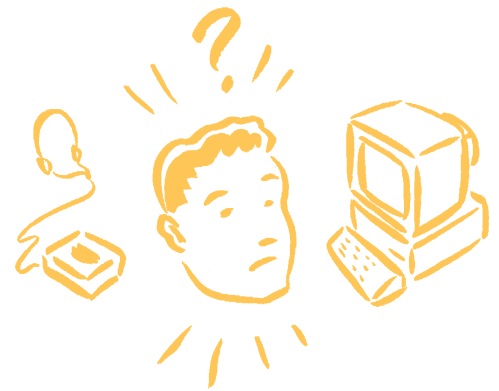
**We are fortunate to live in an age with so many useful tools available to help persons with learning differences.**



## Steps to Success

### Selecting a Technology

1. Include your child in the selection process. Make sure you and your child understand his difficulties, strengths, interests and special abilities. Take into account your child's interest in, experience with and knowledge of technology.
2. Make sure you and your child are clear about the purpose of using the technology—what difficulty are you trying to work around? What specific tasks? Don't expect a magic cure. Be realistic about what the technology will be able to do.
3. Consider "low tech" and "no-tech" bypass strategies as well. For example, calculators and visualization (painting a mental image of a solution) can be quite useful.
4. Find out as much information as you can about the technology before you buy. Talk to past and current users, professionals and anyone who has experience with the tool.
5. Think about when and where the technology will be placed, if it will be moved, and how that might affect your child and others.
6. Choose technologies that are easy to learn, operate and maintain. Look through the manuals to make sure they are easy to read and understand.
7. Make sure you understand the guarantees, warranties and support provided by the manufacturer/retailer.





## Frequently-Asked Questions

---

**Q. Where can I purchase assistive technology?**

**A.** Assistive technology is available from two primary sources. You can purchase these tools from representatives of companies that specialize in technologies for persons with disabilities. Or you can find many of these technologies in stores that supply standard technology to the general public, such as computer stores.

A few companies have developed technologies specifically for people with learning differences. Recently, companies have found that products initially developed for other purposes may be useful specifically for people with learning differences. For example, personal data managers and spell checkers—although not developed specifically for people with learning differences—can prove valuable in working around difficulties. Tools of this type are widely available at electronic or computer retail outlets.

**Q. Can I get funding to purchase assistive technology?**

**A.** Generally financial assistance to purchase or offset the cost of assistive technology can be difficult to find. Possible resources include school systems, employers, private foundations and service clubs. Occasionally, manufacturers of technology offer donations or discounts. Lists of possible sources of financial assistance for persons with disabilities and their families are available in your local and university libraries.

**Q. How can my child learn to use assistive technology?**

**A.** A child can learn to use assistive technology in many different ways. For some products, such as a tape recorder or hand-held spell checker, a good salesperson can explain all your child needs to know. In other cases, the instruction booklet may be enough. In contrast, a speech recognition system may require four to five hours of specialized training. Training may or may not be provided as part of the purchase price, depending on the sales agreement. It is important



to know that “low technology” is not necessarily easier to learn than “high technology.” For example, some personal data managers may take many hours to master, while a speech synthesis/screen review system may require only 30 minutes of practice.

A number of public and private centers, such as The Alliance for Technology Access, have been established to provide assistive technology services for persons with disabilities. (Please see “Resources” at the back of this guide.) Although some of these centers provide services for individuals with learning disabilities, many focus on other disabilities. The services offered by these centers—as well as eligibility for services and fees—vary a great deal and must be investigated on an individual basis.

If instruction in a standard technology is required, such as a word processing program like Microsoft Word®, a manual and an on-line tutorial might be enough. A friend or relative may also be able to train you and your child. In addition, some companies now provide training seminars or tutorials on videotape; check with the manufacturer or retailer. If your budget permits, consider hiring a computer consultant or tutor.

There is an abundance of technologies in the marketplace. To best help your child, consider his strengths, as well as his weaknesses, and talk to a lot of people. Ask questions of everyone. Experiment. As your child develops, his needs may also evolve. Be prepared to look at other options as his needs change.

- Q. Are there any professionals who will help my child learn to use assistive technology?**
- A.** In recent years, a new group of professionals who refer to themselves as “assistive technology specialists” has emerged. As is the case with all professionals, some are better qualified than others. At the present time, these individuals do not have to be licensed; therefore there are no formal credentials required. If you seek a professional’s services, ask for the specialist’s specific qualifications. Ask about the



person's educational background (for example, college degrees), training and experience with learning differences and technology.

Ask the specialist to tell you about the following:

1. specific goals of the instruction
2. philosophical orientation or approach to instruction
3. specific methods he or she uses
4. technology to be used
5. frequency and length of the sessions
6. cost
7. time frame in which you can expect to see desired results.

Always request references. Check the various information sources listed at the back of this guide for agencies to help you locate specialists.

## Resources

The following organizations, agencies and centers offer more information, tools and conferences dealing with assistive technology.

### **Alliance for Technology Access**

2175 East Francisco Blvd., Suite L  
San Rafael, CA 94901.  
415-455-4575  
[www.ataccess.org](http://www.ataccess.org)

### **The American Printing House for the Blind, Inc.**

P.O. Box 6085  
Louisville, KY 40206-0085.  
800-223-1839  
[www.aph.org](http://www.aph.org)

### **Center for Applied Special Technology (CAST)**

39 Cross Street, Suite 201  
Peabody, MA 01960.  
978-531-8555  
[www.cast.org](http://www.cast.org)

### **Center on Disabilities at California State University, Northridge**

18111 Nordhoff Street  
Northridge, CA 91330-8340.  
818-677-2578  
[www.csun.edu/cod/](http://www.csun.edu/cod/)

### **Closing the Gap**

P.O. Box 68  
Henderson, MN 56044.  
507-248-3294  
[www.closingthegap.com](http://www.closingthegap.com)

### **International Society for Augmentative and Alternative Communication (ISAAC)**

49 The Donway West, Suite 308  
Toronto, ON M3C 3M9 Canada.  
416-385-0351  
[www.isaac-online.org](http://www.isaac-online.org)



**Recording for the Blind and Dyslexic (RFB&D)**

20 Roszel Road  
Princeton, NJ 08540.  
800-221-4792  
[www.rfbd.org](http://www.rfbd.org)

**RESNA Technical Assistance Project**

1700 N. Moore Street, Suite 1540  
Arlington, VA 22209-1903.  
703-524-6686  
[www.resna.org/taproject/index.html](http://www.resna.org/taproject/index.html)

**Trafford Center for Technology and Learning Disabilities (TCTLD)**

971 North Altadena Drive  
Pasadena, CA 91107.  
626-791-1255  
E-mail: [center@frostig.org](mailto:center@frostig.org)

---

For information on instructional software see:

*Special Education Technology: Classroom Applications*, by Rena B. Lewis. Atlanta, GA: Wadsworth Publishing, 1993.  
800-354-9706

---

The following organizations, agencies and centers should be helpful in obtaining further information on learning differences in general.

**Coordinated Campaign for Learning Disabilities**

Communications Consortium Media Center  
1200 New York Avenue, NW, Suite 300  
Washington, DC 20005-1754.  
888-GR8-MIND  
[www.ldonline.org](http://www.ldonline.org)

**Council for Learning Disabilities (CLD)**

P.O. Box 40303  
Overland Park, KS 66204-4303.  
913-492-8755  
[www.cldinternational.org](http://www.cldinternational.org)

**International Dyslexia Association**

Chester Building, Suite 382  
8600 La Salle Road  
Baltimore, MD 21204.  
800-ABCD-123  
[www.interdys.org](http://www.interdys.org)

**Learning Disabilities Association of America (LDA)**

4156 Library Road  
Pittsburgh, PA 15234-1349.  
412-341-1515  
[www.ldanatl.org](http://www.ldanatl.org)

**National Center for Learning Disabilities**

381 Park Avenue South, Suite 1401  
New York, NY 10016.  
212-545-7510  
[www.nclد.org](http://www.nclد.org)

**Schwab Foundation for Learning**

1650 South Amphlett Blvd., Suite 300  
San Mateo, CA 94402.  
800-230-0988  
[www.schwablearning.org](http://www.schwablearning.org)

**Tools for Life**

Options Using Assistive Technology  
2 Peachtree Street, NW, Suite 35-415  
Atlanta, GA 30303-3142.  
800-497-8665



## Technologies by Area of Difficulty

		Difficulty					
		WRITTEN LANGUAGE	READING	LISTENING	ORGANIZATION	MEMORY	MATH
<b>Technology</b>	<b>Word Processors</b>	■					
	<b>Spell Checkers</b>	■					
	<b>Proofreading Programs</b>	■					
	<b>Outlining/ Brainstorming Programs</b>	■					
	<b>Speech Recognition</b>	■					
	<b>Speech Synthesis/ Screen Review</b>	■	■				
	<b>Word Prediction Programs</b>	■					
	<b>Alternative Keyboards</b>	■					
	<b>Optical Character Recognition</b>		■				
	<b>Personal Data Managers</b>				■	■	
	<b>Free-Form Databases</b>				■	■	
	<b>Tape Recorders/ Variable Speech Control</b>		■	■		■	
	<b>FM Listening Systems</b>			■			
	<b>Talking Calculators</b>						■
<b>Electronic Math Worksheets</b>						■	

## **Assistive Technology for Children with Learning Difficulties:**

Describes the various types of assistive technology and how to select an appropriate technology.