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ABSTRACT

Intended for use by New York City special education teachers with little or no experience serving students with dual sensory impairments as well as cognitive disabilities, the manual identifies teaching strategies that are easy to implement yet based on direct experience and the current research. Chapter titles and sample topics include the following: "Dual Sensory Impairments: An Understanding" (early development, typical behavior); "Assessment of Auditory Functioning and Auditory Training" (type of hearing loss and possible causes, amplification, auditory training); "Principles of Communication" (communicative intent, prerequisite skills, the van Dijk communication program); "Assessment of Visual Functioning and Vision Training" (structure/function of the eye, definitions, low vision aides and materials); "Orientation and Mobility" (trailing, ascending/descending stairways, sitting); "Arranging the Classroom Environment" (classroom arrangement and instructional equipment); "Curriculum: Where To Begin" (instructional domains, instructional settings, selecting priorities); "References and Additional Readings." Appendixes include listings of organizations of interest to professionals and parents, Early Childhood Direction Centers, and special education training and resource centers. (DB)

WORKING WITH STUDENTS WHO HAVE DUAL SENSORY IMPAIRMENTS AND COGNITIVE DISABILITIES

A HANDBOOK FOR SPECIAL EDUCATION TEACHERS AND RELATED SERVICES PERSONNEL

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New York State Education Department
Office for Education of Children with Handicapping Conditions
Title VI-C
Albany, New York

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PREFACE

In the United States today there are approximately 5,247 children and young adults (up to age 21), who are deaf/blind. A student who is deaf/blind has "...concommitant hearing and visual impairment, the combination of which causes such severe communication and other developmental and educational problems that they cannot be accommodated in special education programs solely for deaf or blind children" (Federal Register, 1977, p. 42478). This definition applies to an extremely heterogeneous group of individuals; many individuals who are deaf/blind retain some residual hearing and/or vision. The information presented in this handbook is focused on students who, besides being deaf/blind, experience severe mental retardation. A large number of these students have additional handicapping conditions, such as cerebral palsy, epilepsy, congenital heart defects, etc. These students have significant educational needs. The delivery of a meaningful education to them poses a significant challenge to the human service system.

In response to this challenge, Congress (in 1968) approved PL 90-247, Part C, which ammended Title VI of the

Elementary and Secondary Education Act to include the establishment of regional centers that would coordinate all the specialized and allied services needed by children who are deaf/blind and their families. In 1970, PL 91-230 extended this program. Because of the scope of necessary services and the widespread geographic distribution of these individuals, it became apparent that the centers had to embark on cooperative efforts involving a range of public and voluntary agencies. All of the agencies involved would share the responsibility of providing direct services to the children and their families by assisting in the implementation of services on both state and local levels. In 1983, the statutes were again amended to award state agencies funds to further develop programs for individuals who are deaf/blind. Each state is now responsible for providing appropriate education, as well as transitional, vocational, independent living, and other post-secondary services to these individuals. (U.S. Department of Education, September 3, 1985). Much has been accomplished in recent years by providing the resources that enable children who are deaf/blind to achieve their full potential to grow into adults who lead

meaningful lives in the community.

The New York State Education Department, Office for Education of Children with Handicapping Conditions, through Title VI-C funds, provides technical assistance to education agencies, parents, and professionals throughout the State, who provide services to children and young adults with dual sensory impairments. One hundred and twenty eight agencies are currently serving approximately 614 youngsters statewide. This project participates in such activities as: child-find, the demonstration of new and innovative educational practices, inservice training for parents, professionals and related services personnel, referral services, and the development and dissemination of materials.

An increasing number of children and young adults who are deaf/blind are now being served by their local school systems. As a result, many administrators, special education teachers, and related services personnel will be providing instruction and support to these students for the first time. It is not uncommon for these individuals to have had little or no training relevant to this task. This handbook is intended to provide these individuals

with some fundamental information and strategies for developing and implementing chronologically age-appropriate functional educational programs for students who are deaf/blind and cognitively impaired. The strategies highlighted in this handbook are stated in ways that are easy to follow. They are based upon the direct experiences of the authors, as well as current research findings and other published works.

The issues and strategies addressed herein represent only a beginning. The reader should investigate the references and resources included in the handbook for a more detailed presentation of the information.

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I. DUAL SENSORY IMPAIRMENT: AN UNDERSTANDING

Early Development

The two primary ways in which able-bodied children learn about their environment are through vision and hearing. The stimulation that an infant derives from seeing and hearing prompts the infant to explore his or her environment. When input from even one sense is missing, the complex system upon which development is based breaks down. When a baby is born with combined sensory impairments, learning is irrevocably altered. While other senses (tactile, gustatory, olfactory) may remain intact and provide the baby with some significant information, these senses cannot substitute for vision and hearing.

In infancy there is an interdependence between sensory input and motor development. Purposeful motor exploration is based on the coincidence of sensory information and a motor act. For example, coordinate use of the hands stems from the random event of the coming together of the hands in the child's field of vision. The infant will then practice this chance event by deliberately and repeatedly engaging in hand play. The observation of the motor act leads to corrections and alterations in subsequent motor acts. The feedback derived from hand play leads to the

development of midline organization, eye-hand coordination, hand reciprocity, and intentional reaching. In the absence of vision there is limited feedback from such hand play. The child is, therefore, not motivated to practice the activity.

All babies make sounds when they cry, breathe, suck and defecate. Later they begin to coo as an expression of delight and babble. Babbling employs vowel sounds, consonants, syllables, varieties of pitch, intensity (loudness), and tempo (pace of vocalization). It is pleasurable and the hearing infant is motivated to repeat and practice the sounds. Babbling elicits responses from the caregiver that prompt the infant to use babbling as a means of communication. The infant then begins to imitate and practice the caregivers' patterns of speech. This sequence provides the foundation for the development of language. In the absence of hearing, the infant is not motivated to repeat and practice the sounds that he or she makes or that are present in the environment.

Infants who are deaf/blind lack access to their environment, including their primary caregiver. They do not see or hear themselves or others, and the information that they do get from their environment is unclear, fragmented and inconsistent.

Typical Behavior

Young infants do not discriminate between themselves and their environment. For example, the young infant will indiscriminately suck on anything, be it his or her thumb, the caregiver's finger, the breast, or the shoulder on which his or her head is resting. As the infant moves away from this stage, he or she begins to, for example, selectively suck his or her thumb rather than the caregiver's shoulder. The process of individuation and separation has begun.

1. Infants who are deaf/blind lack the tools (vision and hearing) that assist in the process of individuation and separation. When the infant is not being touched or held by the caregiver, but the caregiver has, for all intents and purposes, disappeared. Not only is the infant bereft of his or her caregiver, but the compelling stimuli in the environment are also largely absent. The infant does not hear or see the caregiver talking or walking around the room, the crib mobile spinning as it plays a nursery tune, or the sounds and movements of siblings playing. In response to this "aloneness" and the distress that accompanies it, the infant turns in on himself.

2. Some infants who are deaf/blind react negatively

and withdraw from the touch of another person. When attempts are made to nurture and cuddle the baby will turn away, stiffen his or her body, and become fretful and cry. This situation is compounded if the baby is also orthopedically involved. Such responses may discourage those around the infant from interacting with him or her. These infants are often overwhelmed and confused when tactual stimulation is provided. Since they do not receive visual clues, they cannot anticipate being touched. Additionally, tactual information may not be received clearly and thus the baby will not know which part of his or her body is being touched or what it is that is touching him or her. It is likely that without intervention, this behavior will continue throughout childhood.

3. Because of the lack of access to external stimulation, the child who is deaf/blind may seek stimulation from the only reliable source available -- him or herself. The teacher will observe the student head-banging, eye-poking, finger-flicking, light-gazing, rocking, vocalizing, pounding his or her chest, spinning in circles, head weaving, etc; the teacher may also observe complete withdrawal. The self-stimulatory or withdrawal behavior that the student exhibits stems from

patterns established during infancy. While these patterns should be understood as being adaptive for the infant, by school age these behaviors should have been replaced by more appropriate ways of gratifying oneself.

4. The teacher will often see outbursts of seemingly inexplicable tantrumming and/or non-compliant behavior. If this behavior is carefully analyzed, it may become evident that the student is expressing "no" or "stop" in the only way he or she knows how. This is often the sole means by which the student can exert some degree of control over what happens to him or her. Periods of transition and change during the course of the day, moments when demands are made that are interpreted by the student as excessive, times when the student feels insecure, frightened, bored or vulnerable may all occasion outbursts. The teacher should provide the student with alternatives to such behaviors by teaching the student ways of communicating choices, of making decision, and saying "no".

Respecting and acknowledging the student's wishes goes hand-in-hand with teaching the student acceptable ways of exerting control over his or her environment. If the student communicates "no", the teacher must cease the activity. In this way the teacher is reinforcing the

impact of language, and giving the student a sense of him or herself as someone in control of his or her destiny.

5. Students who are deaf/blind live from moment to moment in a world where events appear to occur in a random and unpredictable manner. Therefore, periods of transition (from activity to activity, place to place, from one person to another, or from solitude to the presence of another person) may cause tantrumming, irritability, aggression, etc. In order to help the student develop a sense of temporal organization, the teacher must provide the student with routines that occur with regularity and consistency.

One way in which this can be achieved is to determine an individual routine for each student that is adhered to consistently. Each activity in the student's schedule can then be given a tangible cue that signals its beginning and end. For instance, a pair of underpants or a piece of soap might be associated with toileting time; a spoon or a napkin may signify snack or lunch. These cues may be kept in ordered, individual compartments, such as shoe boxes. At the beginning of the day, the student is directed by the teacher to systematically explore the contents of each box to orient the student to the day's schedule. Then, as each event occurs, the student goes to the appropriate

box, grasps the object, and takes it to the activity. At the conclusion of each activity, the student deposits the cue in an "all done" box, and signs "finish". As the student begins to develop symbolic thought, the objects can be replaced by more abstract cues: raised line drawings or pictures, and eventually braille or the printed word.

Responding to Behavior

1. The student may not want to be interrupted while engaging in self-stimulating and self-gratifying activities. Remember, these activities are precious to the student; they are probably the only events that have been consistent and under the student's control. Other equally stimulating and gratifying activities must be substituted. The teacher must provide the motivation for the student to begin to interact. The teacher may begin by moving co-actively (see Chapter 3) with the student, engaging in the self-stimulatory behavior with the student, hand-over-hand. In doing this the teacher begins to guide self-stimulatory behavior into social behavior.

2. These students may not know or be able to anticipate an individual approaching them. Therefore,

when an individual approaches the student he or she should alert the student to his or her presence. This can be accomplished by standing either next or or at a 45 degree angle to the student and calling the students name while clapping the rhythm of the syllables in the name. The individual may then firmly place one nand on the student's chest and the other on the student's back (between the shoulder blades). The student can then be guided into a standing position or the individual can move distally (gradually outwards toward the hands) and then engage the student in a chosen activity.*

3. It is important not to depart too far from what is familiar to the student. The teacher should observe the student to determine what his or her preferred activities are and incorporate them into meaningful and more appropriate patterns of behavior.

- For example, a student who sits on a chair or on the floor in a fetal position may be trying to affirm where his or her body is in space by maintaining physical contact with all body parts. This student may enjoy gymastic activities involving contact with

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* Personal communication, Analia Gerard, St Luke's/ Roosevelt Hospital Center, Developmental Disabilities Center, October 22, 1987.

and movement of body parts, e.g. somersaults, moving on an air matress. Such a student may also enjoy self-help activities involving contact with body parts, e.g. leaning over to take off a sock or unfasten a velcro sneaker, rubbing fragrant cream on him or herself.

- A student who engages in a great deal of vocalizations and facial grimacing may enjoy chewing gum, sucking a lollipop or salty pretzel rod, or preparing and drinking iced tea, chocolate milk, Tang etc., drinking from a straw, blowing bubbles through a straw into a glass filled with liquid, or using a bubble pipe.
- A student who enjoys light-gazing may be taught to assemble flashlights, and then check to see if they are properly assembled by turning them on. They can also pursue activities that involve the light box (See Chapter IV for a description of the light box). Toys for younger children may be placed on a flashlight or in a beam of light that should be faded once attenionality is established.
- A student who bangs his or her chest or head may be taught signs that involve gross physical movement and that can be delivered with momentum, such as "break", "give me", "stop", "come", etc. Emphasis

should be placed on the physical jolt that is inherent in the gesture when these signs are made with precision and energy. This communication should be responded to by the teacher, even when the teacher is putting the student through the sign. When you put the student through the sign "give me", the student must be given a preferred object. When put through the sign "stop" or "break" the teacher must cease an activity in which the student's self-stimulatory behavior interfers.

4. When the student reacts negatively to the touch of another person or certain textures, or to being in close proximity to others, the student is said to be "tactually defensive". This student should be introduced only to the amounts of tactile stimuli that he or she can tolerate. It is not uncommon for the student to tolerate stimulation to his or her feet but not to any other part of the body (i.e. the face or hands). The teacher should provide overall relaxation activities, i.e. slow rocking on a rocking chair, or pulling the student in a wagon; activities that provide deep pressure to the joints, i.e. hopping or see-saw; direct touch, i.e. gently tapping the students feet, legs. Often the student can best tolerate touching him or herself first. Some students enjoy being

massaged with fragrant lotions, being firmly rubbed with various textures (terrycloth towel, velvet) or playing with water, sand, rice, beans, pudding or whipped cream. The teacher must evaluate what tactile sensations the student will tolerate and then proceed slowly and consistently. As with all the behavior patterns that have been discussed in this section, reluctance to interact with tactile stimuli may be a behavior pattern that has been in place for a long time. The teacher should approach the student slowly and gently and expect that it will take a long time to break into this pattern.

5. When a student's range of motion is severely limited by cerebral palsy or other motor involvement, the teacher must work with the student in order to determine by what means the range of motion can be increased or maintained. This requires the teacher to master techniques of positioning and handling that are beyond the scope of this handbook. For further information on these skills, the teacher must work with physical and occupational therapists. The teacher should read such texts as: Connor, F.P., Williamson, G.G., & Siepp, J.M. (1978). Program guide for infants and toddlers with neuromotor and other developmental disabilities. New York: Teachers College Press; Finnie, N.R. (1974).

Handling the young cerebral palsied child at home. New York: E.P. Dutton.

Once the student has been placed in a therapeutic position, the teacher must insure that his or her environment is motivating and available. Tactually, the student may be stimulated by massage, etc. (see item #4); visually, reflective surfaces such as mirrors or mylar mobiles placed within the student's field of vision may be helpful; auditorily, the student may enjoy wearing headphones; ear-hand and eye-hand integration may be encouraged by having the student use switches to turn on and off a cassette or a sound-producing toy (see Chapter 6, for Burkhart reference) or by making available mobiles for the student to swipe at and grasp. The student should always be able to "turn off" the source of stimulation either by switching off the sound or turning away from the visual stimuli. If the student cannot do this independently, the teacher must carefully monitor the student's responses for signs of discomfort. Either the position or the activity may require change.

6. The primary goal for students who are deaf/blind is to get them in touch with their environment and to keep them in touch, by creating an environment which is

accessible and motivating to them and is consistent in its responses.

II. ASSESSMENT OF AUDITORY FUNCTIONING AND AUDITORY TRAINING

Most individuals who are deaf/blind have some degree of residual (usable) hearing. It is the rare person who is totally deaf. Formal audiological tests are important because they reveal the range of sounds that each individual can hear. However, they do not reveal how an individual uses his or her hearing. It is the teacher's responsibility to evaluate the student's functional use of his or her hearing (using a teacher based assessment program), to alert the student to sound and to make these sounds meaningful (using an auditory training program.)

Detection

1. Any child who does not respond appropriately to sound or who has a delay in language or prelanguage behaviors should be evaluated for a possible hearing loss. Anyone can be tested. The severity of an individual's handicap(s) is not a barrier to performing an evaluation.

2. In a formal hearing evaluation, a variety of

sounds are controlled for intensity (loudness) and frequency (pitch), by an audiologist.

An audiologist might use the technique of observing behavioral responses such as the cessation of sucking, widening of the eyes, blinking, quieting, a turning of the head, and/or startle reflex.

A second technique called visual reinforcement audiometry may also be used. A blinking light or animated object is used to reward attending to the source of sound (e.g. gazing or turning in the direction of the scund).

Another technique is called play audiometry. The child is engaged in a play activity, such as clapping his or her hands, or putting a block in a container each time he or she hears a sound. Visual reinforcement and play audiometry are functional only when the reinforcement and play activities are meaningful to the student.

3. The hearing evaluation techniques chosen may be based on developmental rather than chronological age. The execution of the technique, however, is affected by consideration for age-appropriate materials and activities.

A classroom teacher can perform these behavioral audiometric evaluations informally (without precise controls for intensity and frequency of sound) using familiar materials found in the classroom. Prior to either formal or informal audiometric evaluation the teacher should train the student using the materials that will be used in the evaluation.

- * To estimate a student's sound threshold, stimuli should be presented at varying levels of intensity. This can be achieved by increasing or decreasing the sound intensity or the distance between the sound source and the student. If the student has adequate vision, sound testing should be done outside the visual field. The detection of sound at low frequencies can be assessed by using such sound sources as a drum, banging on the bottom of an aluminum garbage can, or animal sounds such as a cow or a horse. Response to

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* Adapted from Larry Medwetsky, CUNY Graduate Center, Department of Speech and Hearing Sciences, N.Y., N.Y. Informal papers, June - 1987.

range notes on xylophone, or piano. Responsiveness to high frequency sound can be assessed using shrill whistles, cymbals, triangles, or bird sounds.

- The sound level of some of these instruments, can be quite intense when presented at a distance of six inches from the student. Begin with less intense sounds.
- If the student does not startle to the sound but does startle or respond to other sensory stimuli (such as bright lights or vibration), the lack of response suggests a severe hearing loss rather than the lack of response associated with profound cognitive dysfunction.

4. When a student does not consistently respond behaviorally to sound, other techniques are available to evaluate hearing. These are not techniques that the classroom teacher can employ. These may include:

- Evoked response audiometry - sounds are presented through earphones and changes in patterns of brain waves are monitored. This involves sedation which requires careful

consideration.

- Acoustic impedance audiometry - measures the ability of the eardrum to vibrate in response to sound. It gives a good picture of middle ear functioning. This procedure is now more commonly available in schools and out-patient settings.

Types of Hearing Loss and Possible Causes

One way to define a hearing loss is by the location of the physical damage. A hearing loss is typically classified as one of four types: conductive, sensorineural, mixed (a loss having both conductive and sensorineural components) or a central hearing disorder.

1. The conductive component consists of the outer and middle ear. Its function is to collect sounds from the environment and channel them to the inner ear. It changes the nature of what is heard into vibratory patterns that the ear can understand. A conductive hearing loss occurs when there is dysfunction in the outer or middle ear. Such dysfunction may be caused by congenital malformations of the auricle (outer

ear), external ear canal, or the middle ear, chronic otitis media, an obstruction in the ear canal by foreign bodies or wax, a perforated ear drum, otosclerosis, etc. Sounds will be muted for someone with a conductive loss; however, with sufficient amplification the sounds are usable.

2. The sensorineural component of hearing is the cochlea (whose function is to convert patterns of sound into patterns of nerve impulses), and the auditory nerve (whose function is to transmit impulses from the cochlea to the temporal lobe of the brain). A sensorineural loss occurs when there is a dysfunction in the inner ear (cochlea) and/or the auditory nerve. Such dysfunction may have pre-natal or peri-natal causes, such as anoxia, birth trauma, prematurity, congenital malformation, maternal rubella or other viral disease, substance abuse by the expectant mother, or later by such diseases as mumps, meningitis, specific types of head trauma, drug abuse, or extremely loud noises. Sound will be distorted for someone with a sensorineural loss;

speech sounds will be "mushy" or indistinct. There may be an inability to attach meaning to sound or the intermittent inability to direct attention to sound. A child with a sensorineural loss misses many of the early auditory experiences needed for prelanguage and language development.

3. The central component of hearing involves the brain stem and cortex. A central hearing disorder occurs when there is an insult to the brain stem and/or cortex. A central auditory disorder may be caused by maternal rubella or other viral diseases, head injury, brain tumor, etc. Lesions in the central auditory system affect the coding and analysis of auditory information. An individual may have normal auditory sensitivity, but may be unable to respond meaningfully to sound.

Degree of Hearing Loss

A hearing loss can be defined by its severity: mild, moderate, severe or profound. It is calculated in decibels. A decibel (dB) is a measure of the loudness of a sound and can only

be determined by the use of special equipment. The softest sound an individual with normal hearing can perceive is generally defined as OdB. Normal conversational speech has a range of 50-60 dB. While there are standard dB ranges that define degrees of hearing loss, it is important to consult a specialist in the field of hearing impairment to explain the nature and implications of the hearing loss for each child.

1. A mild hearing loss means approximately a 15-30 dB loss. An individual with a mild loss will maintain full audibility of conversational speech but may encounter difficulty in some listening situations, e.g., hearing distant sounds. A child with a mild loss will develop spoken language skills spontaneously, albeit with possible delays.

2. A moderate hearing loss means a 30-60 dB loss. An individual with a moderate loss retains only partial audibility of conversational speech. He or she may experience significant problems in most classroom situations. A child with a moderate loss will

develop spoken language skills spontaneously; however, articulation will be imperfect.

3. A severe hearing loss means a 60-90 dB loss. This individual will get very little information through auditory channels without amplification (such as a hearing aid). During conversation the individual may pick up an occasional word; however, he or she will not be able to participate in conversational speech. A child with a severe loss will not develop spoken language skills spontaneously.

4. A profound hearing loss means a loss of greater than 90 dB. Although an individual with a profound loss may react to very loud sounds, he or she cannot rely on hearing as a primary channel for communication.

5. Another way to describe a hearing loss is to consider whether one (unilateral) or both (bilateral) ears are involved. An individual can have a unilateral or a bilateral hearing loss.

Amplification

1. Almost all individuals who are classified as deaf have some residual hearing. Individuals of any age, including infants, can successfully use hearing aids or other amplification devices (an infant's crib can be set up with amplification). Even those with a severe or profound loss may benefit from hearing aids at home, in the classroom, and the community.

2. A hearing aid is a microphone (that picks up sounds from the environment) and a loudspeaker (that directs the amplified sound into the ear). While a hearing aid amplifies sound, or makes it louder, it will not make it clearer (see sensorineural loss). Individuals who hear distorted sounds will continue to do so when hearing aids are used. Even the most powerful aids will not enable an individual with a severe or profound hearing loss to hear sounds further than a few feet away. This is where the importance of specialized teaching comes in. A student can be taught to define and interpret distortions so that they become meaningful.

3. There are a number of different types of hearing aids. Hearing aids may be worn in a harness around the student's chest (body aids), behind the ear(s) (post-auricular), completely within the ear(s) (in the ear aid), or in the earpieces of eyeglasses. Another type of hearing aid used in classroom settings is a group hearing aid (audio loop). The teacher wears a small microphone and the students wear receivers. The teacher's voice is transmitted by FM radio frequency to the receiver that the student wears. Individual students receive sound at their own specific, optimal amplification level.

4. In order to insure that students who are deaf/blind receive maximum amplification, the classroom teacher should learn how to insert, and adjust hearing aids, as well as check their functioning.

Auditory Training

Individuals who are deaf/blind must be taught to use their residual hearing effectively. Through auditory training, individuals can be taught

that sounds have a source and that sounds have meaning. There are five steps in auditory training: detection, localization, discrimination, recognition, and comprehension.

1. Detection is the awareness of sound. This is one of the first steps in a student's burgeoning awareness of the environment. At this stage, the student learns that a sound has occurred. (The source of the sound is not yet a concern.) Attention to sound may be inferred from a student's verbal or motor responses (e.g. inclining the head in an effort to locate the source of the sound, a change in facial expression, a quieting or calming, or increased activity). The teacher should begin by isolating specific sounds for the student to attend to.

Familiar sounds are particularly helpful in eliciting awareness of sound (e.g. a door slamming, a siren, an alarm clock, a vacuum cleaner, a hairdryer, a blender, a typewriter, or the clanking of dishes and pots.) Whenever a noise occurs the teacher should call attention to it, touch the child's ear and say "Listen,

that was (the door slamming)."

Training for awareness of sound should take place in both formal and natural situations. Formal lessons may include pairing sound with vibratory and visual sensations. Use of the voice light box may be effective here. This is a square box that responds to the intensity of the human voice by illuminating. (It is available from Behavioral Controls, Inc., Division of ALPS, Inc., 31-40 West Fond du Lac Avenue, Milwaukee, WI 53210.) However, there are ample opportunities for training to occur in natural settings such as the school cafeteria, playground, etc.

2. Localization is the ability to associate the source of the sound with the sound. The ability to localize the sound may be inferred by noting such actions as eye movement, head turning, pointing or moving in the direction of the sound.

Localization of sound develops in a specific sequence. When localization training is undertaken, this developmental sequence should be followed:

 - Begin with sounds presented on a lateral plane, level with each ear.

 - Second, present sounds laterally and below the student's head (expect the student to turn his head to the side and then down).

 - Later, when sounds are presented in this position, the student will directly turn diagonally down to the source of sound.

 - Next, present sound laterally and above the head (expect the student to turn his head to the side and then up).

 - Later, when sounds are presented at this position, the student will directly turn diagonally up to the source of sound.

 - At the next stage sounds can be presented at almost any angle.

 - Finally, sounds can be presented directly above or behind the student.

When localization assessment and training take place be sure to use sounds and objects that the student is familiar with and finds pleasurable. Training might include such activities as

tracking or recovery of a beeper-ball, or locating and turning off an alarm clock. The end point of this training is when the student responds appropriately when his or her name is called from a distance of two to six feet. (The student may respond to sounds made by objects, such as crinkling of tin foil or the banging of pots but not to human voices because they want to avoid interpersonal interaction.)

3. Auditory discrimination is the beginning of the integration, analysis, and categorization processes. Due to cognitive dysfunction, some students with adequate hearing may be unable to discriminate one sound from another. Some activities that may be used to teach auditory discrimination include:

- Guessing games (the student can indicate which one of several objects produced a sound.)
- Distinguishing a target sound from background noise. (The student responds to a loud speaker announcement, or to his name being called, or to a command given in a

noisy cafeteria or in a room with music playing).

4. Recognition involves labeling and attaching meaning to sound. The student will begin to recognize recurring patterns of sounds. Once the student understands that sounds have meaning, he or she is able to react to them appropriately. Assessment and training of auditory recognition may include:

- the reaction to tone and tempo, i.e., using accent cueing in commands ("Stand up" with voice pitch rising and rapid tempo; "sit down" with voice pitch lowering and slow tempo)
- the reaction to prohibitive commands
- response to words with gestures, i.e., waving goooodbye
- the realization that words stand for objects whether or not the object is present.

5. Comprehension, the most advanced level of auditory functioning is the ability to understand what is said. The ability to

comprehend language is influenced by attention and memory. The goal of comprehension training is that the student will use his or her hearing to assist in the comprehension of speech.

III. PRINCIPLES OF COMMUNICATION

The deaf/blind student being addressed by this handbook has concomitant mental retardation with possible health problems and physical impairments. This combination of disabilities often limits the student's opportunity to interact with his or her physical and social environment. As the basis of language development appears to be both social and cognitive (Bruner, 1975), reduced experience or interaction within the environment may significantly affect a child's language development. (Stremel-Campbell and Matthews, 1987). Because the acquisition of a system of communication is critical to assuring an individual's participation in a social world, the student who is deaf/blind must be provided with a sequence of educational and social experiences designed to assist him or her with the acquisition of language.

According to Stremel-Campbell and Matthews (1987) the teacher must ask him or herself two questions: How is the student currently communicating? How are the important people in the student's environment communicating to him or her? (p. 168)

Communicative Intent *

Language develops only after a relatively sophisticated nonverbal communication system is established

(Mahoney, 1975). Prior to learning a language system, children display "communicative intent." Children without dual sensory impairments use a communicative "point" (pointing to objects and people), as well as communicative vocalizations as methods of expressing intents: to request objects, actions, attention, or to protest an act. Children comprehend the "communicative intent" of others by seeing gestures, facial expressions, contextual cues and hearing intonation patterns.

Alternate signals need to be developed so that the child who is deaf/blind may have access to the "communicative intent" of others. For instance, the use of on-going routines, objects associated with routines, tactile cues used to indicate the next activity within a familiar routine. (See Chapter 1, Typical Behavior, #5 for further illustration.) Teachers should provide "direct environmental cues within routines, tactile cues, gestural cues, and object association cues" (Stremel-Campbell and Matthews, 1987, p. 166.) The use of an object system for prompting behavior potentially decreases the high

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* This section is adapted from Stremel-Campbell and Matthews, 1987, pp. 141-184.

frequency of physical prompts, as well as providing the student with concrete cues as to what is going to happen within his or her environment. This, in turn, helps the student to develop anticipatory behaviors.

A "receptive concrete object system" can potentially facilitate the student expression of intent. For example, a student can retrieve the underpants (that are kept in a stationary place) used to signal toilet time, to alert the teacher that he or she needs to go to the bathroom.

Prerequisite Skills *

The behaviors of attending, imitation, and the functional use of objects are part of the foundation upon which language training is based.

1. Attending - This refers to the ability to focus on a task for increasing periods of time. Attending may incorporate such skills as in seat behavior, attending to the teacher, and on-task behavior.

   - A student cannot learn if he or she does not look at, listen to, and explore things. If a student cannot attend long enough to objects, persons, and activities he or she will not learn.

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* The succeeding sections are partially adapted from Silberman, 1986, pp. 155-156

- Carefully choose meaningful activities that will facilitate the student's desire to attend. Do not teach "dead man skills" such as looking at the teacher, or staring at a flashlight and expect the student to learn to attend or to generalize attending behavior.
- It is critical that the teacher ends or changes a specific activity before the student stops attending. Build success into the student's repertoire.

2. Imitation - This refers to the ability to copy the behaviors of others. Imitation of actions may create the context of mutuality. Students who are deaf/blind have little or no opportunity to do this. Always encourage imitation in practical situations. In the early stages of development children do not imitate what is unfamiliar to them. Children will imitate only what they understand or comprehend. To assist a student in imitating common activities, it may be helpful to put him or her through the activity. Begin with full physical guidance and then gradually reduce the level of assistance as the student becomes competent.

3. Functional use of objects - This refers to the

manner in which a student uses objects. The sequence of development in this area is as follows:

- First, the student responds in the same manner to all objects; for example, banging, mouthing, shaking or waving object(s).
- Next, the student shows intent by examining the properties of objects in a variety of ways; for example, crumpling, tearing, pushing, and dropping objects systematically.
- Finally, the student demonstrates the functional use of an object by using it appropriately for social and communication purposes; for example, giving a cookie to a peer, putting on glasses, giving the teacher a hearing aid to insert in his or her ear.

The teacher must evaluate what stage the student has reached in this sequence and then provide him or her with the opportunities necessary to learn about the objects in the environment.

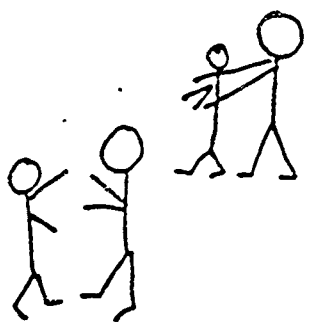
Van Dijk's Communication Program

A language program that has been particularly successful with students who are deaf/blind has been developed by Jan van Dijk of the Netherlands. His approach to communication programming focuses on an area

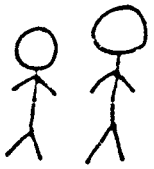
of prelinguistic communication in which both social and cognitive aspects are incorporated through movement techniques. According to van Dijk, language development in students who are deaf/blind begins with the development of body awareness and learning to move the body. The six stages of this program are as follows:

1. Resonance - This stage is characterized by the teacher and student building a comfortable relationship. To facilitate this, the teacher selects a movement that the student enjoys and together they move through it. The student and teacher move (i.e. rock, jump, kneel, walk) in tandem in either prone, seated, creeping, kneeling or standing positions. The goal of this stage is to help the student develop anticipatory behavior. The teacher, therefore, moves, stops, and waits for a response. The teacher is shaping the students response to the movement. The student demonstrates anticipatory behavior by showing both the recognition that the activity has stopped and the desire to begin it again.

2. Coactive Movement Sequence - This stage has four levels:



- Cohesive - The teacher and student perform activities with no physical distance between them.
- Mirroring - The teacher and student perform an



activity opposite from another.

- Parallel - The teacher and student perform an activity next to one another.

- Independent - The student performs an activity alone.

Once a student is able to move through a variety of sequences with an adult, objects such as a chair or bench can be incorporated into the movement sequence. The teacher sets up an obstacle course. A sequence might include straddling a bench, walking to a chair and pushing it down a corridor and sitting on it. The selection of activities should take into consideration the student's age, interests, and motor skills. Older students can be moved coactively through such functional activities as washing, table setting, etc. (see Chapter VII for further discussion of functional, age appropriate activities.)

3. Nonrepresentational Reference - During this stage, a student performs activities that help develop body image. The student also learns that the body can be represented by a picture (a stick figure) or an object (a doll). Pointing is an important skill that is developed at this stage. (See Communicative Intent) First the teacher points to a part of his own body and physically guides the student to do the same on his or her own body.

When the student can imitate the pointing independently, the teacher can then use a doll or stick figure as a model for the student to imitate. Finally, representations of the body in the form of clay doll figures, pipe cleaner stick figures, and paper and pencil or chalkboard stick figures are to be shown to the student for imitation.

4. Deferred Imitation - During this stage, a student performs activities after the model is taken away. A teacher may draw a stick figure or create a model out of clay or demonstrate an action the student sees and/or touches the model; the model is then removed and the student repeats the position from memory.

5. Natural Gestures - Gestures are descriptive by nature. The student has learned that refined body movements can be used to communicate when the student creates "gestures" that are meaningful to him. Initially, gestures are created that describe what the student does with an object. For example, the student uses a throwing motion to express ball and moves his or her index finger rapidly along his or her teeth to express toothbrushing. Subsequently, the student uses gestures that describe what the object looks like, such as a circular hand motion to express ball or using an imaginary toothbrush.

6. Formal Signs - Signs are symbolic by

nature. During this final stage the student is taught the formal use of labels via complete or modified signs based on American Sign Language (ASL) or Signed English. Language (oral, written, sign, as well as augmentative systems of communication) is, above all, purposeful and always takes place in a context. We do not experience language in isolation, but always in relation to a scenario. The teaching of language, therefore, must take place in "natural" contexts.

Factors that should be considered in the selection of signs are as follows:

- The student's ability to accurately perform individual motoric patterns.
- The student's ability to accurately perform motor patterns in correct sequences.
- The functional use of the signed vocabulary to the student (choose words that are used frequently, that are associated with pleasurable events, and that give the student some control over his or her environment.)
- The value of the signs in enabling the student to communicate basic desires and needs in various environments and with a variety of people, i.e. expressing pain, thirst, joy, anger, the desire to stop an activity.

- Signs that require one hand coming into contact with the other hand or one hand coming into contact with some other part of the body are amongst the easiest to perform, i.e. water, more, sick, help, stop.
- Signs that are constructed of movement patterns that are within the student's field of vision are amongst the easiest to perform, i.e. cookie, hot, finish, pretty.
- Signs that involve movement toward the midline of the body are amongst the easiest to perform, i.e. again, like, help, I want.

Augmentative Communication Techniques

Some students who are deaf/blind may not have the motor or cognitive skills necessary for representational communication. They may require alternative and augmentative communication systems. Some of these systems are:

- use of object boards
- picture boards with pictures or photographs of real objects
- specially designed symbols such as Rebus, Blissymbolics,Picture Communication System, etc.

The placement of the symbols on a communication board

should take into consideration the student's visual functioning. For example, if a student has vision in only the right eye, then placement of the communication board should be on the right side of the desk.

Determining the vocabulary content of a communication board should take into account the student's environment, potential communicative partners, student preference and the frequency of the occurrence of words.

Detailed discussion on augmentative communication systems goes beyond the scope of this chapter. For further information refer to: Mathy - Laikko, P., Ratcliff, A.E., Villarrvel, F., and Yoder, D.E. (1987). Augmentative communication systems. In M. Bullis (Ed.) Communication development in young children with deaf/blindness: Literature review III: pp. 205-241. Monmouth, OR: Teaching Research Division, Oregon State System of Higher Education.

IV. ASSESSMENT OF VISUAL FUNCTIONING AND VISION TRAINING

A large percentage of people who are deaf/blind have some degree of usable vision. Residual vision refers to the amount of usable vision an individual with a visual impairment has. Teachers must be concerned with how much the student can see and how well the student utilizes his or her residual vision. One of the teacher's prime objectives must be the development of the student's visual skills in order to supplement his or her available auditory and tactile skills.

Structure and Function of the Eye

The eyes gather visual information from the environment and transmit it to the brain. Light rays, reflected from objects in the environment pass through the cornea or clear front window. Then they pass through the aqueous or watery liquid behind the cornea to the pupil. The amount of light that passes through the pupil is regulated by the iris (colored portion of the eye). The iris expands and contracts in response to the amount of light in the environment. The light rays pass through the lens (a transparent, colorless structure), whose function is to bend the light rays and focus them on the retina. The retina is made up of two kinds of light sensitive receptors, rods and cones. The rods enable a person to

detect gross form and movement and are light receptors. They are responsible for peripheral vision. The rods function best in the evening or in areas of low illumination. The cones enable a person to detect fine detail. They are responsible for color discrimination. The cones function best in daylight or under conditions of high illumination. The retina transforms the light rays into electrical impulses that are then transmitted by the optic nerve to the visual cortex of the brain.

Common Visual Impairments of Student Who are Deaf/Blind

1. Cataract(s) is an opacity of the lens that reduces the amount of light that reaches the retina. Depending on the size, position, and density of the cataract vision may be blurry, distorted, or incomplete. Cataracts can be either congenital or develop later in life (adventitious). The cloudy lens may be surgically removed (even from an infant's eye). A contact lens may be implanted following surgery or glasses may be prescribed.

2. Cortical Blindness is a condition that results from damage to the visual cortex of the brain. While the eye may show no internal pathology, neurological damage prevents the processing of visual information. It is a frequent (but not always accurate) diagnosis when medical

retardation is present.

3. Glaucoma is a disorder characterized by increased intraocular pressure caused by a defective drainage system within the eye. This increased pressure may eventually destroy the cells of the retina and optic nerve. Glaucoma can be congenital or adventitious, and may be treated by medication (eyedrops) or by surgery. Symptoms of untreated infantile glaucoma include tearing, photophobia (light sensitivity), and blepharospasms (spasms of the eyelids). In addition, symptoms such as nausea, redness of the eye, hazy cornea, headaches, and extreme pain in the eye should alert teachers to the possible presence of glaucoma or that the glaucoma is out of control. Early and ongoing medical treatment is essential in order to prevent permanent visual loss.

4. Microphthalmia refers to abnormally small eyeballs and anophthalmia refers to no eyeballs. Children can be born with either of these conditions.

5. Nystagmus is the involuntary, rapid movement of the eyes most commonly from left to right (pendular). It can be associated with neurological damage or problems with eye muscle control. A student with nystagmus may be

photophobic (light sensitive), nearsighted (myopic) have problems with depth perception, have difficulty focusing on objects, and reading smoothly.

6. Retinitis Pigmentosa (RP) is an inherited disorder that causes the gradual deterioration of the retina. Initially, the rods are destroyed. Thus, the first symptoms of RP may be poor night vision and loss of peripheral vision. This slow, progressive loss usually begins during adolescence, but may present earlier. RP causes extremely constricted fields of vision (often referred to as "tunnel vision"). It may eventually lead to total blindness. This condition combined with congenital deafness is known as Usher's Syndrome.

7. Rubella Retinopathy is a condition in children with congenital rubella that is characterized by widespread pigment deposits on the retina. Sometimes these children have blank spots in their visual field due to pigment deposits.

8. Strabismus is the tendency of one or both eyes to deviate inward (esotropia) or outward (exotropia). If left untreated strabismus may result in the loss of functional vision. Strabismus can result from weakness of

the muscles that control eye movement, from cataracts, a damaged retina, or from poor visual acuity. Individuals with cerebral palsy often have strabismus.

Definitions

1. Visual acuity refers to the ability to clearly distinguish forms or discriminate objects or symbols at specified distances.

2. Visual functioning refers to how well a person uses the vision he or she has. Visual acuity does not necessarily reflect visual functioning. Visual functioning is a learned behavior; therefore, a student may have poor visual acuity, but good visual functioning, or vice versa. Visual functioning is determined by the experiences, motivations, needs, and expectations of each individual in relation to whatever visual capacity is available to accomplish activities.

3. Visual field refers to the area of sight. When looking straight ahead, a person with normal vision can see objects within an arc of approximately 180 degrees. A person who is visually impaired may have an extremely limited field of vision. He or she may be able to see only a narrow central field or may only be able to

distinguish objects in the periphery. Additionally, a person may have blind spots in his or her field of vision. Even within an extremely restricted visual field, visual acuity may be good.

4. Legally blind refers to a clinical measurement of central visual acuity of 20/200 or less in the better eye with correction, or a visual field impairment (either central or peripheral) of less than 20 degrees. A student with a measured visual acuity of 20/200 can see at 20 feet what a normally sighted person can see at 200 feet. All children who are legally blind should be registered with the New York State Education Department, Office for Education of Children with Handicapping Conditions, Room 1066 EBA, Albany, N.Y. 12334. The American Printing House for the Blind (APH) provides educational materials to school-age children who are legally blind (and who are registered with their State Education Department) through funds from the federal government.

5. Low-vision refers to an individual that is severely visually impaired but who does have significant usable vision. The majority of students who are deaf/blind have low vision.

6. Eye reports often contain the abbrevations O.D., O.S., and O.U. These mean, respectively, right eye, left eye, and both eyes.

Detection

1. All children regardless of age or severity of disability can participate in a vision screening program. It is important to consult specialists in the fields of ophthalmology and optometry in order to understand the nature and implications of visual loss for each child, and to make recommendations for low vision aids.

2. There are a number of signs that should alert a teacher to possible visual deficits or to the possible deterioration of a student's vision; these include:

- relying primarily on fingers, hands, or mouth to explore objects
- frowning, squinting, blinking
- awkward body posture such as a head tilt or walking with one's head looking down
- walking with a hesitant, shuffling gait or bumping into objects
- behaviors such as light-gazing, eye poking, or finger flicking at eye level
- redness of the eye, tearing, mucus discharge, frequent

rubbing of the eyes

- preference for one eye, viewing only at close range or at a distance
- complaints of pain in eye(s), frequent headache, blurriness, or complaints that the eyes feel dusty or scratchy
- discomfort in extremes of illumination, either low or high.

3. If the teacher suspects a change in visual function or requires more information, the student should be referred to an ophthalmologist or an optometrist.

Functional Vision Assessment and Training

The purpose of a functional vision assessment is to determine a student's visual capabilities and limitations. The results of the assessment will aid the teacher in incorporating activities that increase visual functioning into the student's Individualized Education Program (IEP), as well as providing information necessary to insure that visual needs are considered in every aspect of programming. This section consists of suggested materials and activities for use in the assessment and training of vision.

1. Awareness of light and objects - The teacher should shine a penlight or flashlight approximately six inches in front of the student's eyes and observe response, i.e., constriction of pupils, reaching or moving towards light, blinking, smiling or signs or displeasure. If the student does not respond the teacher should use a large flashlight and turn it on and off. If the student does not respond in an illuminated room look for a response in a darkened room. It is important to avoid shining the light directly into the student's eyes. Initially it may be necessary to pair the visual stimulus with an auditory or vibratory stimulus. The teacher may also use colored filters over lights and/or brightly colored objects that move or spin.

2. Blink reflex - Does the student blink (or move) when an object is quickly moved towards his or her eyes? (Be aware that a blink may be a response to the movement of air rather than a response to a visual stimuli.)

3. Eye preference - When one eye is covered, and then alternately the other, does the student's posture change in an effort to continue looking at what he or she has been viewing?

4. Localization of light or objects - This is the

ability of a student to find a stationary light or object that is presented in various areas of the visual field. When using a light source, it may be helpful to darken the room. It is important to note the size and distance of the objects or light source presented. If an object is used it should be a motivating one, i.e. a favorite toy, food etc.

- Central fields - Does the student move his or her eyes (or head) in order to focus on light and/or small objects that are presented in front of his or her face?
- Peripheral fields - Does the student move his or her eyes (or head) in order to focus on light and/or small objects that are presented outside the vicinity of his or her face? When assessing or training peripheral vision, the teacher should stand behind the student and present the materials from behind to either side.
- Visual field preference - Does the student demonstrate a preference for light and/or objects presented in specific areas of the visual field?

5. Tracking - Does the student follow (track) moving lights and/or objects with one or both eyes or by moving his or her head? The development of tracking skills proceeds from short, choppy eye head movements to smooth

visual pursuit. The teacher should observe if the student tracks using his or her eyes alone or both eyes and head. Some activities that may be used to teach visual tracking are:

- Hold a penlight about 16 inches from the student's eyes and move it slowly in different directions. If the student loses the target, the light should be turned off and then turned on again in order to obtain the child's attention.
- Shine a light along a wall (in a darkened room) and have the student follow visually or try to touch the reflection of the moving light. Initially, the teacher should provide physical guidance.
- Using a pulley on a clothesline, have the student follow objects being pulled across midline.
- Have the student track such objects as a balloon or bubbles.

6. Scanning - This skill requires the student to systematically shift visual attention from one object to another. Place three objects which are pleasing to the student on a surface within his or her field of vision. It may be necessary to manipulate the student's head in order to describe the task.

7. Reaching or movement toward lights or objects - When presented with lights or objects does the student reach or move towards them? Gradually position the light source or objects further away from the student. Use brightly colored or mylar balloons, tinsel, bicycle streamers, aluminum foil, and illuminated objects, etc., that may motivate the student to reach. The teacher should consider modifications for the student whose range of motion is impaired.

8. Shifting attention - Two flashlights are aimed at the student. When the lights are alternately turned on and off does the student's gaze move from one to the other? Objects, such as finger puppets may be placed on top of the flashlight and illuminated, or simply placed on the examiner's fingers and jiggled alternatively.

9. Visual/motor integration - Additional higher level activities for increasing visual functioning include those normally incorporated into educational programs for all students. These activities include:

- sorting
- matching
- classifying and sequencing
- obstacle courses

A classroom teacher can perform vision assessment and training using familiar materials found in the classroom. Prior to conducting the assessment the teacher should develop a rapport with the student and familiarize him or her with the materials to be used. As students who are deaf/blind often exhibit inconsistent visual behavior the entire assessment should be conducted twice, on two different days. One person should administer the assessment and a second should record the responses. (It is a good idea for the person who administers the assessment the first time to record the responses the second time and vice versa).

NOTE: The teacher should be aware that the use of blinking lights may be contraindicted when a seizure disorder is present.

Low-Vision Aids and Materials

1. Acetate - When placed on a printed page or illustration colored acetate (preferably yellow) darkens print and highlights contrast.
2. Bookstands - Some activities can be presented on a bookstand. By bringing objects closer to a student's line of vision, postural fatigue can be avoided. Additionally, many children with cerebral

palsey prefer to look across, not down. Use vertical stands.

3. Closed circuit television - Enlarges printed and illustrated materials (up to 200X) and projects it onto a large T.V. screen. For further information contact American Foundation for the Blind (see appendix).

4. Felt tipped pens and colored markers - Low vision students may respond more easily to bold letters and pictures.

5. Lamps - All light fixtures should have the capacity to illuminate at variable intensities.

6. Light box - The light box and accompanying sequenced activities and materials, are available from the American Printing House for the Blind (see appendix). These assist in the instruction of tracking, scanning, eye-hand coordination, visual discrimination, color discrimination, visual attention, and visual perceptual skills.

7. Magnifiers and telescopic aids - Either hand held in glasses, or on a stand. These may be prescribed by a low vision specialist.

8. Sun shields and visors - These may be indicated if a student is extremely sensitive to light.

9. Talking book machine and cassettes - These are

available (free of charge from the Library of Congress) to students who are legally blnd and who are registerec with the American Printing House for the Blind (see appendix).

10. Templates and stencils - These aid visual motor control. They can be made out of cardboard or purchased commercially in plastic or metal.

11. Trays - Most table activities should be presented in trays, as they provide clear boundaries of the student's work space. Materials should be set up in left to right work progression.

V. ORIENTATION AND MOBILITY

Moving in space can be frightening for a student who is deaf/blind. Because the student is getting limited feedback from his or her environment and, in cases of low cognitive functioning, may be unable to interpret whatever feedback he or she is getting, the student may not know where he or she is within that environment. A student's reaction to such disorientation may be misconstrued as negative behavior, but should be understood as a reasonable response to a frightening situation. It is the teacher's responsibility to order and structure the environment, and to make it accessible, so that the student can travel safely and comfortably.

Mobility is the capacity for movement. Orientation is the use of sensory information in order to determine one's position and relationship to objects in the environment. As mobility and orientation skills help to ensure self dependence they are among the most important skills that a student who is deaf/blind can acquire.

An orientation and mobility program should teach the student to focus on three principles;

- where he or she is in the environment
- where he or she wants to go

- how he or she can reach the objective.

Trailing

1. Trailing is a technique whereby a student keeps in constant physical touch with the environment as he or she moves within it. (The student usually maintains contact with a wall or other stationary object.) Trailing is used to teach a student to move independently from one place to another.

2. Initially, it will be necessary for the teacher to be positioned behind the student. The back of the student's hand is kept in light contact with the wall (when the surface is rough it may be better to use the palm) as the student moves along the trail towards the destination. The student should be no more than 10 inches from the wall (this varies depending on the size of the child) with his or her arm extended downward and forward at approximately a 45 degree angle. The fingers are relaxed, close together, and slightly flexed. It is important that the hand remain ahead of the body (the hand should contact objects before the whole body makes contact).

3. The student should begin trailing in a familiar environment, such as the classroom. The student can then be taught to trail from the classroom doorway to a chair; then from the chair to the sink in classroom; sink to cubby; and then to familiar destinations outside the classroom such as the bathroom or the cafeteria. Consistent trailing routines should be maintained.

4. To begin a trailing program the teacher sets up the classroom so that there are trails to follow. Specific objects that serve as cues may be added to the environment. These objects may include: furniture or architectural details (doorways, drinking fountains, corners), tactual runners along walls (corrugated cardboard, rope, fabric), visual runners along walls (day-glo paint or tape, Christmas tree lights, mylar), and/or auditory cues (bells or other sound producing objects). In a trailing program tactual methods can be used in conjunction with visual and auditory cues.

5. The student should learn to identify the cues that will enable him or her to trail from one place in the classroom to another, i.e., from his or her seat to the coat closet.

6. Consistent scheduling and programming will enable the student to anticipate where he or she has to go. For example, upon entering the classroom each morning the student trails a clearly established path to the closet, or at snack time the student trails a clearly established path to the trays. In addition to clearly marked trails, the student must be given verbal, gestural and/or signed cues to begin and/or sustain trailing to a destination.

Sighted Guide

1. The sighted guide technique refers to a sighted person guiding a person with a visual impairment. The sighted guide sets the pace according to the needs and capabilities of the student.

2. In the sighted guide technique, the student remains in constant physical contact with the guide. The student should grasp the guide's arm just above the elbow. This position allows the guide full use of his or her arm, and allows the student to interpret the guide's movements, e.g. stopping, turning, etc. A short student, walking with an adult, may grasp the adult's wrist. It is important for both student and guide to be comfortable and maintain a relaxed position.

3. The guide should remain alongside and approximately a half step ahead of the student. The sighted guide remains ahead of the student in order to protect the student from danger (the guide approaches the area first and avoids unsafe place, e.g. obstructions, holes, etc.).

Ascending and Descending Stairways

1. Stairway travel can be a frightening experience for a student who is deaf/blind. Teachers often mistake disorientation and fearfulness for negative behavior. It is better to work on ascending stairs first because there is less fear of falling.

2. It is best to approach a flight of stairs straight ahead. Never approach on an angle. The student must use the right hand rail and move with the normal flow of traffic. The guide should remain one step ahead of the student and stop when he or she comes to a landing to allow the student to catch up.

Sitting

1. A student must learn to locate his seat and sit down independently. This is facilitated if each student's chair is identified by a personal cue. This same cue should be used to consistently identify all of the

student's personal landmarks in the classroom (i.e., coat, hook, cubby, tray).

2. The teacher may have to bring the student into contact with his or her chair. The student's hand should be guided to the back of the chair, while the other hand examines the seat in a circular motion. The student is then guided to the front of the seat (while maintaining hand contact with the back of the chair) and sits down.

VI. ARRANGING THE CLASSROOM ENVIRONMENT

The classroom environment is one of the critical determinants of successful learning. Although all schools have both physical and administrative limitations, the teacher should provide a classroom environment that is flexible and capable of being adapted to the individual needs of the students.

Students who are deaf/blind require highly structured, stable, and routinized classroom environments. These students receive limited and fragmented sensory information from their environment. They are dependent upon their teachers to structure the environment in a way that highlights and emphasizes relevant information and makes this information accessible. These students require clear boundaries that define areas throughout the classroom, as well as an enriched sensory environment.

Classroom Arrangement

The starting point for classroom design is the same as for all other instructional strategies--evaluate the student's areas of strength and need in relation to various environmental arrangements. As students learn and develop, the classroom arrangement should be reviewed and, if necessary, adapted accordingly.

1. Distinct work areas must be established. These may include: a vision training area, an auditory training area, a leisure and rest area, an area for group activities, an area for individual work, an area for the teacher and instructional staff, and if space permits, an area for messy activities (i.e. planting, arts and crafts).

2. Different areas can be clearly demarcated by:

- walls created by shelves or closets (these must be stable)
- pathways marked by wide colored tape or mylar
- walls, floors, and doors of different colors or textures, with high contrast (i.e., carpet, wood, linoleum, burlap, contact paper)
- tactual pathways that facilitate trailing along the walls (i.e., corrugated paper, felt runners, tinsel or aluminum foil)
- bulletin board stands

3. When partioning the classroom, keep five things in mind:

- design pathways and landmarks that promote independent travel
- create surfaces and spaces that absorb sound and

reduce the excess reverberation of noise

- make sure that all areas have sufficient illumination and that the illumination may be varied according to need
- alert the students to any changes in the configuration of the classroom
- make sure that nothing sticks out (that may injure a student who is trailing.)

4. Students should be familiar with the boundaries of their individual work space.

- The limits of the immediate work area can be clarified by using a tray or raised edge or placemat (such items should be stabilized with tape or velcro). A prerequisite for any table top activity must be the orientation of the student to the workspace and the materials to be used during the lesson.

5. Students should be given preferential seating to accommodate their specific auditory needs. Students with the most severe hearing loss should be seated closest to the teacher. The student's favorable ear should be oriented towards the teacher at all times.

6. Each student's individual visual needs should determine:

- the lighting selected (consider intensity, glare, diffuseness, etc.)
- the colors chosen
- the size of materials used
- where materials are placed

7. Students with orthopedic involvement should be positioned in ways that will enhance their ability to access sensory information from the environment. (See Chapter 1, Responding to Behavior, #4 for further discussion.)

Instructional Equipment

1. Three considerations underlie the successful incorporation of instructional equipment into the classroom:

- Proper use: this requires attention to appropriate operating procedures found in equipment manuals.
- Equipment backup: even correctly used equipment breaks down. Therefore, the teacher must have both alternative plans, as well as spare parts.
- Preparation: have all equipment set up and ready

to use.

Some Resources for Instructional Equipment

Many of the following resources will send you catalogues free of charge. Some provide assistance regarding equipment, as well as consultation regarding special instructional challenges.

1. A Manual of Augmented Sensory Feedback Devices for Training Severely Handicapped Students
   Philippa H. Cambell, William McInerey & Mark Middleton
   Children's Hospital Medical Center of Akron
   Akron, Ohio 44308

2. Adaptive Environments
   Massachusetts College of Art
   621 Huntington Avenue
   Boston, MA 02115
   (617) 739-0088
   (Publications on environmental design and adaptations)

3. American Foundation for the Blind
   15 West 16th Street
   New York, NY 10010
   (212) 620-2000

4. American Printing House for the Blind
   P.O. Box 6085
   Louisville, KY 40206
   (502) 895-2405

5. Guinta Associates
   67 Leuning Street
   South Hackensack, NJ 07606
   (212) 594-4974
   (201) 488-4425
   (Environmental modification and equipment for individuals with hearing impairments.)

6. Independent Living Aids
   11 Commercial Court
   Plainview, NY 11803

(516) 681-8288

7. Linda J. Burkhart
8503 Rhode Island Avenue
College Park, MD 20740
(Designs for teacher made adaptive equipment and switches.)

8. Telephone Pioneers of America
Manhattan Empire Chapter
195 Broadway
New York, NY 10007

Showroom:
1095 Avenue of the Americas
New York, NY 10036
(212) 395-8408
(Adaptive equipment for people with sensory and physical disabilities. Will custom make equipment to meet individual needs.)

VII. CURRICULUM: WHERE TO BEGIN*

Curricula for students who are deaf/blind should reflect functional and chronologically age-appropriate experiences, as well as reflecting transitional stages in the life cycle.

1. Functional curricula facilitate the development of skills that are necessary in everyday life. How do you determine if an activity is functional? The teacher simply asks him or herself: "If the student doesn't learn to perform this activity, will someone else have to do it for him or her" (Brown, Branston, Hamre-Nietupski, Pumpian, Certo, & Grenwald, 1979)? If the answer is yes, the activity is probably a useful one to teach.

2. Chronologically age-appropriate curricula refer to instructing students to perform activities ordinarily engaged in by their non-handicapped peers. How do you determine if an activity is chronologically age appropriate? The teacher simply asks him or herself: "What would an able bodied student of the same age be doing at home, at school, in the community, and during leisure/recreational time" (Brown,etal., 1979.)?

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* This section is adapted from Falvey, 1986.

3. Transition is the preparation of students of any age for future responsibilities and expectations. For example: a preschool student should be taught to put on his/her own sweater, as this is a skill that will be expected of him or her in elementary school; an 11 year old should be taught to sweep floors, operate a stereo, respond to an alarm clock (or an adapted mechanism for signaling time), and use a public restroom, as these skills may be expected of him or her in the home, the workplace, or the community; a 14 year old should be taught good grooming as this is expected of adolescents and adults.

Instructional Domains

Begin the process of program development by thinking about what the student may be, should be, or potentially will be doing:

- at home (domestic living skills)
- at work (pre-vocational, vocational and work related skills)
- in the community
- during free time (leisure and recreation skills)

Remember, all students of all ages will participate in these environments in different ways.

- Domestic living incorporates such skills as: taking

off one's coat, making a bed, eating lunch, doing laundry, cooking, choosing appropriate clothing, etc

- Work skills incorporate such activities as: using vending machines and pay telephones, asserting oneself appropriately with a supervisor, working in close proximity to peers, understanding routines and time-frames, etc.
- Community activities incorporate such skills as: getting on and off the school bus, behaving appropriately on that bus, ordering food in a restaurant, walking in the park, asking for assistance, and waiting on line, etc.
- Leisure and recreation incorporates such activities as: planting fragrant herbs and flowers, making a scrapbook of fragrant perfume ads found in fashion magazines, playing with a toy, using a cassette player, making a clay pot, looking at Christmas tree decorations, social dancing, using a stationary bicycle, etc.

Instructional Settings

1. All activities performed during a student's day are potential learning experiences. Activities should be taught in the locale where they usually take place and at the time when they typically occur. For example, tooth

brushing should be taught only in the bathroom and only after eating; instructing a student in removing his or her coat should take place after he or she arrives in the classroom from the outdoors, or before the child returns home.

2. Instruction in a variety of environments facilitates the generalization of skills. For example, when instructing a student to clear the table after meals, he or she should perform this objective in the classroom after snacks and in the cafeteria after lunch. To insure that the student will be able to participate in family life, this goal should also be carried out in the home.

3. Sometimes it is not practical to teach a skill in the natural environment. When this is the case the skills should be taught and practiced in a simulated environment. For example, making change to pay for purchases, ordering food in a restaurant, and janitorial tasks can all be simulated in the classroom.

4. The student who does not possess the host of skills necessary to participate in a specific activity or environment should never be excluded from that activity or environment. The "principle of partial participation"

(Baumgard, Brown, Pumpian, Nisbet, Ford, Swat, Messina, Schroeden, 1982) suggests that all students be given opportunities to acquire skills not yet in their repertoire. This is accomplished by having the student participate in those aspects of the activity to the extent that he or she can. The teacher should provide all assistance and/or adaptations needed to include the student. For example, if a walk in the neighborhood is too challenging for a specific student, rather than eliminating the activity or excluding the student when walking in the neighborhood, walk only a short distance from the school and back; begin in a familiar environment and then gradually increase the distance. If a student does not have the hand skills necessary to mix chocolate milk, the teacher can anchor the cup to the table, use a large container for mixing, and/or build up the handle of a spoon (in width and/or length), or use hand over hand assitance. In a group art lesson, the student who is deaf/blind can participate in a meaningful way if the teacher texturizes and scents the paint (i.e., by adding sand, rice, beans, lemon, vanilla, or almond flavoring, etc.), encourages the student to use his or her hands rather than a paint brush or sponge, or provides the student with clay for sculpting.

Assessing Student Need

The goal of assessment is to uncover the student's abilities rather than to document failure. Assessment is useful to the teacher to the degree that it helps identify a student's needs and assets. It is upon these needs and assets that the individualized education program is based. Teachers can assess students with commercially available, as well as with teacher-made assessment materials.

1. The following are just a few of the commercially available assessments that may be helpful with students who are deaf/blind:

Freagen, S. Wheeler, J., McDonnel, A. Brankin, G., & Costello, D. (Eds.) (1983). Individual student community life skill profile system for severely handicapped students. (Available from: Dekalb County Special Education Association, 4418 Maple Street, Cortland, IL 60112; (815) 758-0651).

Meyer, L., Reichle, J. McQuarter R., Cole, D., Vandercook, T., Evens, I., Noel, R., & Kishi, G. (1985). Assessment of Social Competence (ASC): A scale of social competence functions. University of Minnesota: Consortium Institute for the Education of Severely Handicapped Learners.

Petersen, J., Treker, N., Egan, I., Fredericks. D., & Bunse, C. (1983). Teaching research assessment procedures for the secondary student with severe handicaps. Monmouth, OR: Teaching Research Division, Oregon State System of Higher Education.

Stremel-Campb ell, K. (1984). Communication Placement Assessment Inventory. Monmouth , OR: Teaching Research Division, Oregon State System of Higher Education.

(Petersen et al. and Stremel-Campbell are available from: Teaching Research Division, Oregon State System of Higher Education, 345 N. Monmouth Avenue, Monmouth, Oregon 47361; (503) 838-1220.)

Stillman, R. (1978). The Callier-Azusa Scale. Dallas, TX: Callier Center, University of Texas, Callier Center for Communication Disorders.

Stillman, R.D. & Battle, C.W. (1986). Callier-Azusa Scale-H: Cognition & Communication. Dallas, TX: University of Texas at Dallas.

There are also a number of commercially available curricula that have assessment components:

Dalke, B., Fay, M.L., & Lindley - Southard, B. (1985). Moving on: A model for total life-planning. Monmouth, OR: Teaching Research Division; Oregon State System of Higher Education.

Egan, I. Fredericks, H.D.B., Peters, J., Hendrickson, K., Bunnse, C., Toews, J., & Buckley, J. (1984). Associated Work Skills: A Manual. Monmouth, OR: Teaching Research Division, Oregon State System of Higher Education.

Fredericks, H.D.B., Meyer, M., Makohon, L., Bunse, C., Buckley, J., Trecker, N., Egan, I., Johnson-Dorn, N., Miller-Case, V., Fay, M.L., Paeth, M.A., Alrick, G., & Samples. B. (1983). Dressing clothing-care & selection. Monmouth, OR: Teaching Research Division, Oregon State System of Higher Education.

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(The above curricula are available from: Teaching Research Division, Oregon State System of Higher Education, 345 N. Monmouth Avenue, Monmouth, Oregon, 97361; (503) 838-1220.).

Wolf, E.G., Schein, J.D. (1982). AIM II: initial learning curriculum. (Available from: Three Bridge Publishers, 1703 Andros Isle - J2, Coconut Creek, Florida, 33066).

MD: Paul H. Brookes.

One teacher-made assessment method is the "discrepancy analysis." This technique can be a useful way of determining what activities and skills need to be taught and how they should be taught. In a "discrepancy analysis", the teacher identifies the routines and activities the student's able bodied peers perform during the course of their day. The teacher then task analyzes each activity and determines discrepancies that exist between the student's performance and the way in which the activity should be performed. The teacher then identifies specific adaptations that can be provided to enable the student to participate in the activity. More information on how to perform a discrepancy analysis and develop curricula can be obtained from Falvey, 1986 (See References and Additional Readings.)

Selecting Priorities

1. After the teacher has completed assessing a student, it will be apparent that the student who is deaf/blind has numerous instructional needs. The needs that should be addressed first are those of major social significance which will enhance the student's potential for community integration. The goals should be attractive to the

student and important to significant others in the student's life (i.e. the family, peers, other teachers).

2. In determining priorities a number of other factors should be considered:

- Does the student value this activity?
- Do significant others in the student's life value this activity?
- Is the activity age appropriate?
- Is this activity performed with regularity and frequency?
- Is this an activity that will be engaged in across a number of environments?
- How much time and effort will be needed in teaching the student to acquire a particular skill?
- Is it worthwhile to teach this skill to this student at this point in time?

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Appendix A

ORGANIZATIONS OF INTEREST TO PROFESSIONALS AND PARENTS

Alexander Graham Bell Association
for the Deaf, Inc.
3417 Volta Place, N.W.
Washington, DC 20007
Voice/TDD: (202) 337-5220

Focuses on speech education for people who are deaf and hearing impaired. Disseminates informational materials to all interested persons.

American Foundation for the Blind, Inc.
15 West 16th Street
New York, NY 10011
(212) 620-2000

Provides a variety of services to people who have visual impairments, the public, and professionals. Some of these services include the development and distribution of aids and appliances, maintaining a reference library on blindness and related areas, publishing books, monographs, pamphlets, and periodicals on blindness and related areas in print, recorded, and braille format as well as maintaining the National Technology Center.

American Printing House for the Blind, Inc.
1839 Frankfort Avenue
Louisville, KY 40206
(502) 895-2405

A federally funded organization for the development and distribution of educational aids and appliances for students who have visual impairments. Conducts research on educational methods. Maintains a registry of all children in the United States who are legally blind.

Association for Persons with Severe Handicaps
7010 Roosevelt Way, N.E.
Seattle, WA 98115
(206) 523-8446

A professional organization concerned with the delivery of services to persons with severe handicaps and their

families. Publishes a newsletter, a journal, and monographs. Sponsors an annual conference which is the major forum for the exchange of information and ideas that relate to persons with severe handicaps. Supports legislative initiatives that affect the lives of people with severe handicaps.

Council for Exceptional Children
1920 Association Drive
Reston, VA 22091
(703) 620-3660

A professional organization for teachers, teacher educators, administrators and other professionals concerned with the education of children with disabilities. Publishes journals and books. Initiates and supports legislation that affects the delivery of services to children with disabilities. Sponsors an annual convention.

Early Childhood Direction Centers
New York State Education Department
Division of Program Development
Room 1071 Education Building Annex
Albany, N.Y. 12234
(518) 474-8917

Early Childhood Direction Centers (ECDCs), coordinated by the New York State Education Department and located throughout New York State, are resources for parents. They provide information about preschool special education programs and help parents to obtain services for their children (ages birth to five). ECDCs services include: referral to agencies providing direct services (medical, educational, social services) assisting parents in obtaining services and in petitioning family court, and follow up to insure that children receive appropriate services. See Appendix B for a complete listing of the ECDCs located throughout New York State.

Gallaudet University
800 Florida Ave. NE
Washington, D.C. 20002
(202) 651-5000

Gallaudet University is a multi-purpose education center that serves hearing impaired people around the world

through its comprehensive programs in research, academic and public service. Galludet houses the National Information Center on Deafness (202-651-5051). In the College of Continuing Education there is a Program of Adult and Community Education (PACE), that sponsors a program in hearing/vision impairment. The Federal Department of Education has recently awarded Gallaudet with a grant to fund The Center on Hearing/Vision Impairment. The goal of this center is to address the quality of education available to deaf/blind children.

Helen Keller National Center for Deaf/Blind
Youths and Adults
111 Middle Neck Road
Sands Point, NY 11050
Voice/TDD: (516) 944-8900

A federally funded center that provides evaluation and prevocational rehabilitation training to people who are deaf/blind from all over the country. This national center also conducts extensive field services through regional offices and affiliated programs, maintains a national register of persons who are deaf/blind, and designs sensory aids.

International Association for Education of Deaf/Blind
Contact: Mrs. R.C. Wallenstein, 8 Kent Street, Concord, N.H. 03301

A professional organization concerned with the education of children and youth who are deaf/blind. The organization publishes a newsletter, as well as sponsoring international and local conferences.

John Tracy Clinic
806 West Adams Boulevard
Los Angeles, CA 90007
(213) 748-5481

Provides free correspondence courses for parents of young children who are deaf and deaf/blind. Assessment and communication are emphasized, as well as support to both parents and teachers.

National Technical Institute for the Deaf
Rochester Institute of Technology

One Lomb Memorial Drive
P.O. Box 9887
Rochester, NY 14623
Voice: (716) 475-6400
TTY: (716) 475-2181

Provides a technological, postsecondary education to students who have hearing impairments. Disseminates information materials and instructional videotapes on deafness and related areas.

New York State Education Department
Office for Education of Children with
Handicapping Conditions
Title VI-C
Washington Avenue
Education Building, Annex Suite 1066
Albany, N.Y. 12234
(518) 474-2251
Roland Smiley, Project Director

This project participates in such activities as: child find, the demonstration of new and innovative educational practices, inservice training and technical assistance for parents, teachers, related services personnel, referral services, and the development and dissemination of materials in support of children and youth (aged birth through 21) who are deaf/blind.

Special Education Training and Resource Center
New York State Education Department
Division of Program Development
Education Building Annex - Room 1071
Albany, N.Y. 12234
(518) 474-8917 or 22510

Special Education Training and Resource Center's (SETRC's) provide parents, teachers, administrators, Board of Education members, related services personnel, agency representatives and other interested individuals with information about managing challenging behavior, adapting curricula and environments, evaluation of student learning styles, home teaching strategies, the IEP process, available services and current laws and regualtions. SETRC trainers develop and present training on specially designed topics based on local needs and statewide

initiatives. The professionals at the centers are available on a request basis to consult with educators and parents: See Appendix C for a complete listing of the SETRC's located throughout New York State.

Technical Assistance Center (TAC)
TAC/HKNC
111 Middle Neck Road
Sands Point, N.Y. 11050
Voice and TTY: (516) 944-8900
Angela M. Covert, Ed.D., Project Director

A federally funded project of national significance, providing technical assistance in support of programs that facilitate transition services for individuals who are deaf/blind and have attained the age of 22. Programs eligible to receive technical assistance range from education to community based recreation, work and living options.

Appendix B

EARLY CHILDHOOD DIRECTION CENTERS

Early Childhood Direction Center
Children's Hospital of Buffalo
936 Delaware Ave.
Buffalo, NY 14209
(716) 878-7282 or
1-800-462-7653

Regional Early Childhood
Direction Center
264 Village Landing
Fairport, NY 14450
or
University of Rochester
Strong Memorial Hospital
601 Elmwood Avenue
Rochester, NY 14642
1-800-462-4344 or
(716) 223-6220

Early Childgood Direction Center
724 Comstock Avenue
Syracuse University
Syracuse, NY 13244-4230
(315) 423-4444, 423-3851 or
1-800-962-5488

Early Childhood Direction Center
Broome-Delaware-Tioga BOCES
421 Upper Glenwood Road
Binghamton, NY 13905-1699
(607) 729-9301 Ext. 421 or 422

Early Childhood Direction Center
Franklyn-Essex-Hamilton BOCES
P.O. Box 28
Malone, NY 12953
(518) 483-6523

Early Childhood Direction Center
of the Capital Region
Albany-Schenectady-Schohorie
BOCES
Maywood Elementary School
1979 Central Avenue
Albany, NY 12205
(518) 456-9071

Early Childhood Direction Center
101 Burley Avenue
Kingston, NY 12401
(914) 338-6755

Early Childhood Direction Center
St. Agnes Hospital
305 North Street
White Plains, NY 10605
(914) 681-4656

Early Childhood Direction Center
New York Hospital-N-507
525 East 68th Street
New York, NY 10021
(212) 472-6535

Early Childhood Direction Center
NICU
Interfaith Medical Center-Site A
1545 Atlantic Avenue
Brookly, NY 11213
(718) 604-6412

Early Childhood Direction Center
United Cerebral Palsy of Queens
82-25 164th Street
Jamaica, NY 11432
(718) 380-3000 Ext. 265

Early Childhood Direction Center
Variety Pre-Schooler's Workshop
47 Humphrey Drive
Syosset, NY 11791
(516) 364-8580

Early Childhood Direction Center
Suffolk Child Development Center
Hollywood Drive
Smithtown, NY 11787
(516) 366-2935

Early Childhood Direction Center
Lincoln Medicaland Mental Health
Center
234 East 149th St. 4A Room 50
Bronx, NY 10451
(212) 579-5778, 579-5779

Appendix C

SPECIAL EDUCATION TRAINING AND RESOURCE CENTERS

Albany-Schoharie-Schenectady BOCES SETRC
Maywood School
1979 Central Avenue
Albany, NY 12205
(518) 456-9069

Broome-Delaware-Tioga BOCES SETRC
421 Upper Glenwood Road
Binghamton, NY 13905
(607) 729-9301 Ext. 362

Buffalo City SETRC
School #75
99 Monroe Street
Buffalo, NY 14206
(716) 856-5595 or 856-4710

Cattaraugus-Allegany-Erie-Wyoming
BOCES SETRC
Windfall Road
Box 424-B
Olean, NY 14760
(716) 372-8293

Cayuga-Onondaga BOCES SETRC
234 South Street Road
Auburn, NY 13021
(315) 253-0361

Clinton-Essex-Warren-Washington
BOCES SETRC
Box 455
Plattsburgh, NY 12901
(518) 561-0100 or 563-8960

Delaware-Chenango SETRC
BOCES WDC
R.D. 1
Sidney Center, NY 13839
(607) 865-6591

Dutchess BOCES SETRC
Poughkeepsie Middle School
55 College Avenue
Poughkeepsie, NY 12601
(914) 471-0983

Erie 2-Chautauqua-Cattaraugus BOCES
SETRC
9520 Fredonia Stockton Road
Fredonia, NY 14063
(716) 672-4371 Ext. 337

Franklin-Essex-Hamilton BOCES SETRC
Adirondack Education Center
Bloomingdale Avenue
Saranac Lake NY 12983
(518) 891-5410

Genesee-Wyoming BOCES SETRC
8250 State Street Road
Batavia, NY 14020
(716) 343-1400 Ext. 296

Hamilton-Fulton-Montgomery BOCES
SETRC
Fulton-Montgomery Community College
Route 67 - Room L210
Johnstown, NY 12095
(518) 762-7754

Herkimer-Fulton-Hamilton-Otsego
GOCES SETRC
Gros Blvd.
Herkimer, NY 13350
(315) 867-2082

Livingston-Steuben-Wyoming BOCES SETRC
Holcomb Building
Geneseo, NY 13478
(716) 243-5470

Madison-Oneida BOCES SETRC
Spring Road
Verona, NY 13478
(315) 363-8000

Monroe 1 BOCES SETRC
41 O'Connor Road
Fairport, NY 14450
(716) 265-4030

Monroe 2-Orleans BOCES SERC
3599 Big Ridge Road
Spencerport, NY 14559
(716) 352-2483 or 352-2443

Nassau County BOCES SETRC
Rosemary Kennedy Center
2850 North Jerusalem Road
Wantagh, NY 11793
(516) 781-4044 Ext. 270-1-2

New York City SETRC
New York City Board of Education
Central Office - Room 610
131 Livingston Street
Brooklyn, NY 11201
(718) 935-4015

New York City SETRC
High School Office - Room 213
High School for Humanities
351 N. 18 Street
New York, NY 10011
(212) 675-6101

Region I SETRC
P.S. 79
55 East 120th Street
New York, NY 10027
(212) 534-6500 Ext. 32 or 33

Region II SETRC
Junior High School 101
2750 Lafayette Avenue - Rm. 304
Bronx, NY 10465
(212) 892-5527 Ext. 44 or 45

Region III SETRC
360 36th Street
Brooklyn, NY 11232
(718) 965-4800 Ext. 53

Region IV SETRC
P.S. 199
1100 Elm Avenue
(718) 645-8515

Region V SETRC
Francis Lewis High School
58-20 Utopia Parkway
Flushing, NY 11365
(718) 357-8510

Oneida-Herkimer-Madiso BOCES SETRC
Box 70-Middle Settlement Road
New Hartford, NY 13413
(315) 768-4614 or 768-4686

Onondaga-Cortland-Madison
BOCES SETRC
P.O. Box 4754
Syracuse, NY 13211
(315) 433-2645

Ontario-Seneca-Yates-Cayuga-Wayne
BOCES SETRC
Finger Lakes Educational Center
3501 County Road 20
Stanley, NY 14561
(716) 526-6410

Orange-Ulster BOCES SETRC
Gibson Road
Goshen, NY 10924
(914) 294-5431 Ext. 276

Orleans-Niagara BOCES SETRC
Kenan Site
195 Beattle Avenue
Lockport, NY 14094
(716) 439-4328, 4329 or 4320

Oswego BOCES SETRC
County Route 64
Mexico, NY 13114
(315) 963-3094

Otsego-Delaware-Schoharie-Greene BOCES
SETRC
Rexmere Park
Stamford, NY 12167
(607) 652-7531 Ext. 29

Rensselaer-Columbia-Greene BOCES SETRC
Green Meadow School
1588 Schuurman Road
Castleton, NY 12033
(518) 477-8771 Ext. 304-6

Rochester City SETRC
Central Administrative Offices
131 West Broad Street
Rochester, NY 14608

(716) 325-4560 Ext. 2710

Rockland BOCES SETRC
BOCES Media Center
Tappanzee Facility
Route 9-W
Piermont, NY 10968
(914) 365-1450

St. Lawrence-Lewis BOCES SETRC
Northeast Campus
P.O. Box 330
Norwood, NY 13668
(315) 353-6684

Saratoga-Warren BOCES SETRC
Myers Education Center
Henning Road
Saratoga Springs, NY 12866
(518) 584-3239

Schuyler-Chemung-Tioga BOCES SETRC
Broad Street School
Broad Street
Horseheads, NY 14845
(607) 739-3581 Ext. 341

Steuben-Allegany BOCES SETRC
Early Instructional Center
R.D. 1 - Box 82
Bath, NY 14810
(607) 776-4181

Suffolk 2 BOCES SETRC
School Services Center
Winganhauppauge Road
Islip, NY 11751
(516) 277-7403 or 277-7404

Sullivan BOCES SETRC
Ferndale Loomis Road
R.D. 2, Box 522
Liberty, NY 12754
(914) 292-7500

Syracuse City SETRC
Teacher Center
501 Park Street
Syracuse, NY 13208
(315) 425-4685

Tompkins-Seneca-Tioga BOCES
SETRC
555 South Warren Road
Ithaca, NY 14850
(607) 257-1551 Ext. 276

Ulster BOCES SETRC
175 Route 32 North
New Paltz, NY 12561
(914) 255-1402

Washington-Warren-Hamilton-Essex
BOCES SETRC
Dix Avenue, Building "I"
Southern Adirondack Education Center
Hudson Falls, NY 12839
(518) 793-7721 Ext. 219

Westchester-Putnam 1 BOCES
SETRC
Pinesbridge Road
Yorktown Heights, NY 10598
(914) 245-1050 245-2700 Ext. 288

Westchester 2 BOCES SETRC
Instructional Services Department
Concord Road
Ardsley, NY 10502
(914) 693-7576

Yonkers City SETRC
Pupil Resource Center
John Burroughs Junior High School
150 Rockland Avenue
Yonkers, NY 10710
(914) 963-2944 or 963-0592