

FINE-MOTOR SKILLS

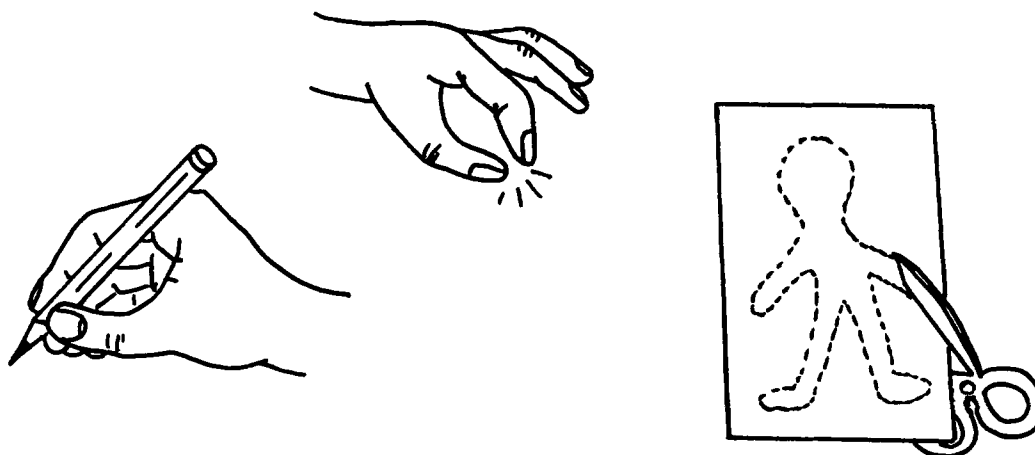
Fine-motor coordination involves the ability to control the small muscles of the body and is usually defined as the ability to coordinate the action of the eyes and hands together in performing precise manipulative movements (eye–hand coordination). The early forerunners of fine-motor control appear to be the reflex grasp and avoidance reactions that become integrated and refined with increasing age and experience.

Most manipulative activities require the use of the two hands working together to perform the task. These are referred to as *bi-manual activities*. Single-handed manipulative tasks are referred to as *uni-manual activities*; for example, opening a door. The third type of manipulative activities are *graphic activities* which include drawing and hand-writing.

In general, children show the most improvement in simple fine-motor control behaviors from 4 to 6 years, whereas more complex control behaviors tend to improve gradually from 5 to 12 years. Isolated finger, hand, wrist, and foot movements tend to improve significantly from 5 to 8 years.

Vision is known to play an important role in fine-motor control. Continued visual experience is necessary for feedback and refinement of early guided-hand responses.

Kinesthetic input from receptors in the muscles, joints, tendons, and skin also provide essential information for development and refinement of fine-motor actions.



WHY TEACH FINE-MOTOR?

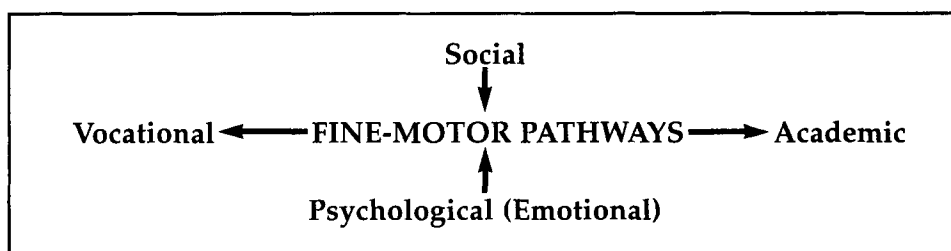
Children explore the environment by moving and interacting with it. By manipulating objects and gathering valuable information about the physical characteristics, this even-



tually provides perceptual information necessary to make future judgments without the need for physical contact. Through a matching of perceptual and motor information, a child can interpret the characteristics of the environment more efficiently.

Young children at school spend approximately 60%–70% of their time completing fine-motor work or activities. Approximately 12% of children experience difficulties in this area.

Proficiency in fine-motor control allows the child to develop skills that will have consequences immediately and in later life.



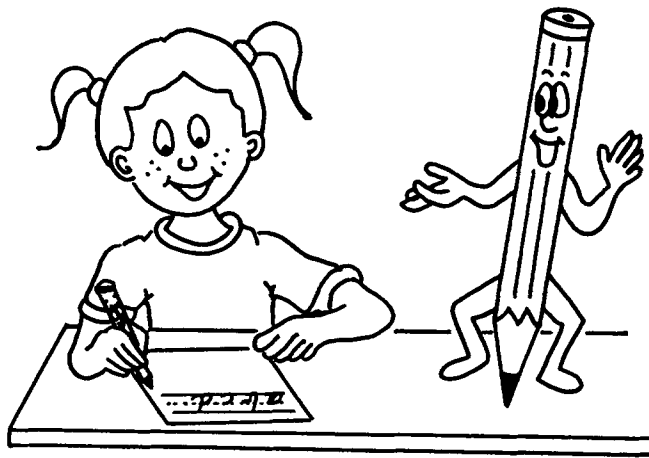
- ▶ **Social Consequences.** You cannot hide the way you move. Simple tasks such as tying laces or handling any utensils or objects can cause frustration and embarrassment. The child who has poor coordination begins to wonder why something that is natural and taken for granted is so difficult to perform.
- ▶ **Vocational Consequences.** Because a number of vocations—including dentistry, secretarial work, cabinet making, and many others—have a large fine-motor component, the choices for the individual with fine-motor difficulties begin to diminish.



- ▶ **Academic Consequences.** Quick and precise handling of concrete objects in mathematics and science becomes difficult. Precision and speed in handwriting and drawing tasks are minimized, affecting the amount of work being completed. When actions are not automatic, the available working memory and attentional space in the brain is taken up with concentrating on the movement rather than the concept being learned and practiced.

- **Psychological (Emotional) Consequences.** Children with poor coordination often have unsuccessful experiences in physical activities. As a consequence they can develop frustration, a fear of failure, and rejection which in turn can lead to the development of a negative self-concept and avoidance behaviors. This can dramatically affect classroom performance not only in the fine-motor area but in other areas as well. Research tells us that a child's attitude toward learning in a particular area is at least as important as a child's ability in that area.

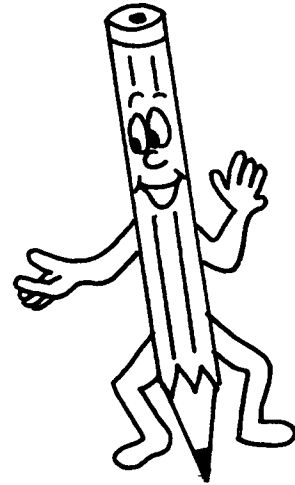
THE BEST FORM OF EARLY INTERVENTION IS PREVENTION!



GOALS AND PROGRAMMING FOR A FINE-MOTOR PROGRAM

GOALS

- Develop and refine lifestyle manipulative skills.
- Develop and refine manipulative skills that will be used throughout a child's educational career.
- Promote speed, fluency, and efficiency of movement.
- Promote correct temporal and spatial accuracy in movement.
- Promote tactile kinesthetic awareness.
- Promote and provide a catalyst for transfer of perceptual skills using manipulative activities.
- Immerse the child in language.
- Provide a stimulating and alternative form of learning.
- Establish writing readiness skills.
- Provide a developmental program that contains individualized activities that will ensure the child experiences success.
- Provide extra time for those children experiencing difficulties.
- Promote a nonthreatening environment.



PROGRAM SUGGESTIONS

Traditionally fine-motor activities are presented in an informal way to young children in the education system. As stated previously, a significant percentage of children experience fine-motor difficulties and, as such, this informal presentation and practice of activities is not sufficient for their development in this area. Teachers and parents working with children experiencing difficulties must appreciate that these children need to spend more time practicing if they are to improve.

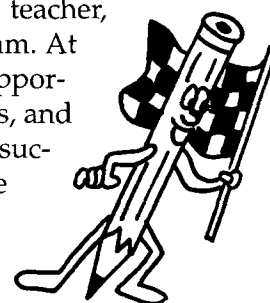
The following section presents a sequence for teaching children fine-motor and manipulative skills, and provides samples of the types of activities and skills they are trying to achieve in these activities. Although this book has been produced primarily for children experiencing movement learning difficulties in the fine-motor and manipulation areas, the activities can be easily adapted to formal class teaching in early childhood education.

Ideas for uni-manual and bi-manual activities are all around us. All it takes is a little imagination to apply them in a formal setting. The pencil-and-paper activities suggested in this book can be found commercially in many books, but we feel that the requirements of most activities can be produced simply, cheaply, and quickly by teachers and parents. So take the ideas and strategies presented in the following sections, work consistently and patiently with the children, and enjoy and share their progress.

GETTING STARTED

By observing children in informal situations and/or through formal testing procedures, teachers, remedial specialists, and parents can determine where a child is experiencing difficulties, whether it be in all areas of fine-motor control, a specific area, or in a specific skill such as tying laces. With this information, it is then possible to plan appropriate strategies. Some observable behaviors and difficulties that children display, are listed on pages xxv–xxvi.

Below are some suggestions for organizational strategies a teacher, remedial specialist, or parent could employ in a fine-motor program. At this point, it is essential to stress again that providing children the opportunity to practice skills is not enough. Teachers, remedial specialists, and parents should become familiar with the techniques required for successful movement and ensure that the children are being given the appropriate instruction and feedback to achieve quality in these movements. Failure to do this allows the child to practice and develop poor movement habits that are difficult to rectify.



PREREQUISITE SKILLS

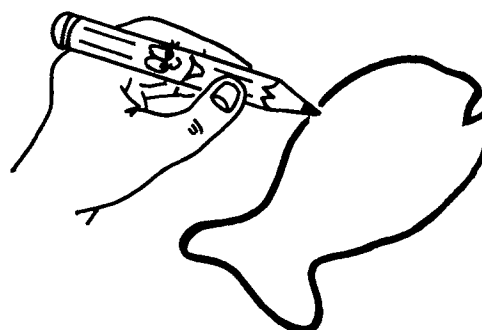
Development in the areas of attention, motor memory, body image, spatial awareness, and associated language concepts are important prerequisite abilities. The *Complete Motor Skills Activities Program* provides activities to promote these skills if they have not yet developed adequately.

Young children need to practice visual-motor skills and develop kinesthetic and tactile awareness. They also need to develop abilities such as correct muscle tone, relaxation, rhythm, force control, timing, and estimation skills. These are initially practiced through using manipulative equipment such as scarves, lummi sticks, balloons, and similar types of equipment. As these skills are developing, gradually the demands for greater precision are introduced. A teacher, remedial specialist, or parent can have a child practice these activities in isolation, introduce them as warm-ups (e.g., lummi stick or relaxation activities) before a writing activity or include them in station play as discussed in this book.

Finger activities are also very useful as warm-up activities before commencing other fine-motor activities. If children display specific difficulties with finger isolation, then the exercises themselves can become an individual session.

The following aspects should be covered in a fine-motor program:

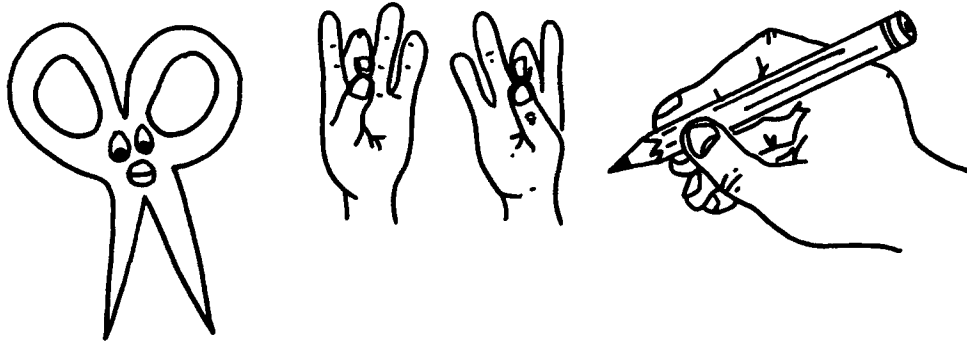
- Kinesthetic and tactile awareness
- Uni-manual manipulation



- Graphic skills
- Bi-manual manipulation

In a fine-motor program we can expand on these four areas to include any combinations of the following activities:

1. *Pencil and paper activities.* Drawing, painting, coloring, channeling, tracing, copying, writing, tearing, cutting and folding.
2. *Uni-manual and bi-manual manipulative activities and circuits.*
3. *Commercial games and activities.* These can also be included in the manipulative tasks when doing fine-motor circuits.
4. *Model making,* using different techniques and different materials.
5. *Structured free play.*
6. *Visual motor, kinesthetic, tactile, relaxation exercises, and strengthening activities.*



TIPS:

- Use finger exercises. Lummi sticks and manipulo boards are simple and effective activities that can be used daily for short periods to enhance dexterity.
- Teach the children what aspects of movement to concentrate on before allowing practice; for example, precision grip. Try to provide feedback as often as possible.
- Music creates an excellent working environment.
- Teachers have the opportunity to create formal whole-class fine-motor lessons, or to incorporate movement enrichment programs for small groups of children needing assistance. Parents or older students assisting as tutors is an excellent strategy for maximizing teaching and individualizing.
- The activities can be made more challenging by introducing time and quantity challenges; i.e., how many or how long. This must only be done when the children are successfully completing the tasks correctly. The activities can also have cognitive concepts added to them as described in Section 3 information on fine-motor boards and activities.
- Preparing workbooks is initially time consuming but worth the time and effort when children and tutors know exactly what they are going to do and can record their results.

OBSERVABLE BEHAVIORS OF CHILDREN WITH FINE-MOTOR DIFFICULTIES

OBSERVABLE BEHAVIORS

- ▶ Difficulty with writing; poor grasp leading to poor form, fluency, and frequent discomfort when writing.
- ▶ Difficulty controlling speed of movements leading to excessive speed and resultant untidy work, or work not being completed due to overly slow movements.
- ▶ Difficulty with precision grip and inaccurate release and therefore problems with games that involve placement of pieces; for example, dominoes.
- ▶ Difficulty with spatial relations leading to difficulties with design and copying.
- ▶ Tearing paper and/or breaking pencils due to force-control difficulties.
- ▶ Difficulty with learning to dress and undress.
- ▶ Preference for outdoor activities.
- ▶ Clumsiness and frustration: spills food; drops objects; breaks objects.
- ▶ Frustration towards and/or resistant behavior to manipulative and graphic tasks.
- ▶ Excessive muscular tension when performing fine-motor tasks.

MANIPULATIVE AND GRAPHIC DIFFICULTIES

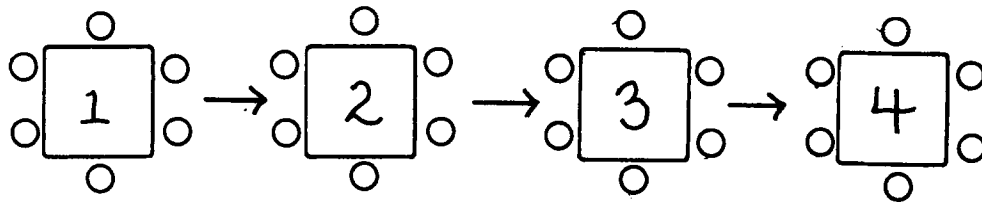
- ▶ *Tremors* or small movements of the hand, which are especially apparent when writing or performing precise manipulative tasks such as threading.
- ▶ *Poor kinesthetic and tactile awareness* prevents accurate feedback and refining of movements which allow a child to eventually perform a task without looking at their hands; for example, typing/keystroking.
- ▶ *Hypotonia* or poor muscle tone will affect a child's reaction time and the force applied to tasks such as writing.

- ▶ *Hypertonia* or excessive muscle tone frequently leads to graphic problems, and/or temporal and spatial judgment difficulties.
- ▶ *Dyspraxia* or difficulties with motor planning results in poor sequencing of the necessary limb movements to produce a smooth skillful action. Dyspraxic children have difficulties with assembly tasks, self-care skills, and often—through frustration—display excessive tension.
- ▶ *Manual graphic difficulties* include dysgraphia (writing and/or drawing difficulties) and difficulties with tasks involving dexterity.
- ▶ *Visual/perceptual-motor difficulties* affect printing and writing skills, and copying and interpreting abilities such as tracking, depth perception, and visual discrimination.
- ▶ *Synkinesis* is demonstration of uncontrolled and unwanted movements in parts of the body other than that being used for the manipulative task.

STRATEGIES FOR CLASS TEACHING

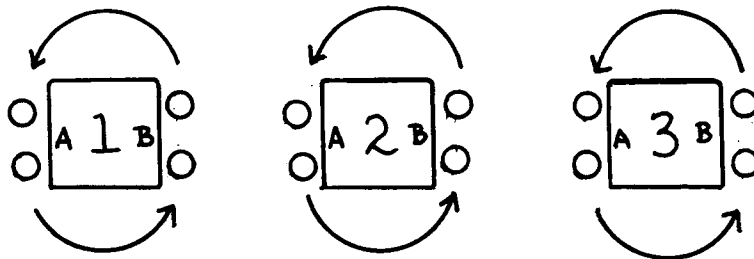
STRATEGY 1

Children working in groups of four or five are situated around the class and each group has a *particular task* to perform at that station. At the end of 3–5 minutes, the children rotate to another station. The advantage of this is that the tutor has time to reinforce and provide feedback to the children on that particular task, or, if there is a common mistake, explain this to the whole group. Activities can be chosen from the areas of finger exercises and visual-motor skills.



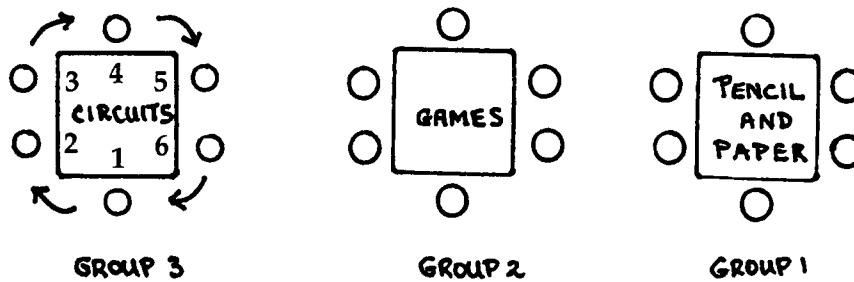
STRATEGY 2

The extension of Strategy 1 is to divide the children into even-numbered groups. At each station have two activities **A + B**, each dealing with a similar concept; for example, a bi-manual task. At each station, the two activities have to be duplicated depending on how many children are in each group. Half of the group completes the station **A** activity (2–3 minutes), while the other half completes the station **B** activity. The groups then rotate activities at that station and, after completing the second task, rotate to the next station. The advantage of this is that the children do not have to stay on the activity for so long. For young children—especially those with attention difficulties—this can be an advantage. As in Strategy 1, the children have a particular task to complete.



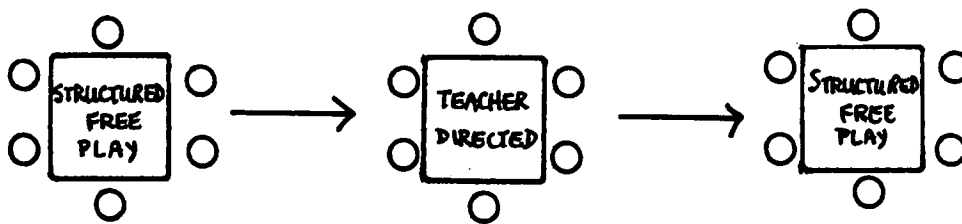
STRATEGY 3

This strategy requires dividing the children into 4–5 groups, with each group working at a station for the entire session. Each station provides a different area of fine-motor control. Because of the number of activities, this strategy is more productive, so we recommend that parents or older students be used as tutors at the stations. For example, group 1 works on pencil-and-paper activities; group 2, model-making; group 3, fine-motor manipulation circuits; group 4, commercial activities and games; and group 5, structured free-play activity. The only group that rotates is group (3) on the circuits (see diagram). At the next session, the groups will remain the same and work at a different station. Therefore, allow 2–4 weeks to complete the rotation depending on how many sessions per week occur.



STRATEGY 4

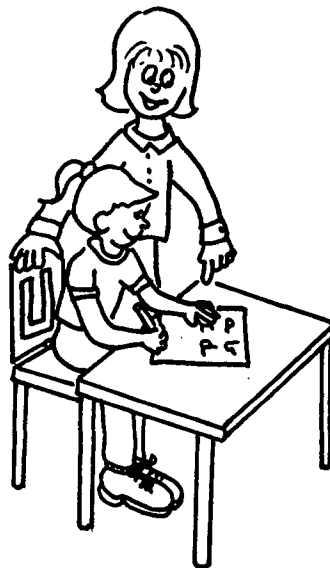
Place the children into groups so that the children will spend 3–5 minutes at each activity. One or two stations are teacher-directed and the other activities involve structured free play. Children become responsible for setting up the activities. (If parent assistance is available, use two teacher-directed stations.)



STRATEGIES FOR A MOVEMENT ENRICHMENT GROUP OR INDIVIDUAL CHILD

Activities of finger exercises and visual motor skills provide excellent warm-up or closing activities.

1. **Concept approach.** All activities are different but concentrate on one concept; for example, bi-manual manipulation. The children rotate around the activities spending 3–5 minutes on each. This strategy is best employed with groups of children who have similar difficulties.
2. **Tabloid approach.** Different activities from the different areas of fine-motor control are presented to the children. This means the children will be able to practice some activities at which they may be already efficient, as well as activities with which they may experience difficulties.
3. **Structured free play.** This provides opportunity for children to have time to experiment with different materials using different methods of manipulation. Feedback on technique is still required.



FINE-MOTOR CHECKLIST

The observation or focus points are provided below in a convenient checklist box, and then followed by a more detailed description of each focus point. We emphasize the importance of being in the know of what skill(s) are involved in the activity the children are performing and being able to observe for correct technique, as well as note areas of difficulty. For example, if the child is cutting out a shape, what skills does he or she need to perform and complete the task? What difficulties does he or she have? How do we correct these difficulties?

Muscle strength
Posture
Muscle tension
Finger isolation
Precision grip
Grip release
Hand size and shape/grip
Hand-eye coordination
Fluency of arm transport
Force control
Manipulation speed
Hand steadiness
Kinesthetic sensitivity



- **Muscle strength.** Adequate strength in the postural and manipulative muscles.
- **Posture.** Correct posture provides the foundation for correct movements.
- **Muscle tension.** Correct muscle tension in muscles (not too loose or too tight).
- **Finger isolation.** Refers to the ability of the child to select and accurately move the finger(s) used for a particular task.
- **Precision grip.** Grip used to pick up and manipulate objects. Involves the thumb and forefinger and often support from the middle finger.

- **Grip release.** Poor grip release (too quick and forceful).
- **Hand size and shape/grip.** Correct hand shape and grip for a particular task; perception, estimation, and control of grip size.
- **Hand-eye coordination.** Hand-eye coordination is appropriate (accurate hand/finger placement).
- **Fluency of arm transport.** Action of the shoulders, arm, wrist, and fingers is fluent and the action of the body movements is in the correct order.
- **Force control.** Controlling the amount of force required for manipulation.
- **Manipulation speed.** Control of the speed of movement (not too fast or too slow).
- **Hand steadiness.** Hand movements are steady (reduction of tremors).
- **Kinesthetic sensitivity.** The feedback from muscles, joints, skin, and tendons that is used to assist in refining movements.



ASSESSING STUDENTS

When looking at assessment in movement—whether it be gross motor or fine motor—a number of stages need to be considered dependent upon what level of understanding you require of student performance. Below is a guideline as to some aspects of assessment that need to be considered.

STAGE 1: GLOBAL ASSESSMENT

During this first stage, you should observe and monitor the children in formal and informal situations. You should make qualitative judgments on the children's level of coordination. For those children appearing to have difficulties, you should make some anecdotal comments.

This monitoring is ongoing and provides the foundation for reporting.

STAGE 2: SCREENING

This optional stage involves assessing children on the standardized tests that are available and recognized as reliable and valid.

The results provide important information on the levels of coordination of the children in these areas. This information is extremely useful for class and individual student programming.

STAGE 3: ONGOING QUALITATIVE ASSESSMENT

This stage involves your monitoring and making qualitative observations in the different skill areas. Using checklists, information can be gained that provides the foundations for teaching, individual correction, and feedback in the class. Again, the need is for you to be familiar with the key movement points given for individual skills.

STAGE 4: INDIVIDUAL ASSESSMENT FOR THE PURPOSE OF REMEDIATION

If, from your global observations and from standardized testing, a child is recorded as experiencing difficulties, then you should use checklists to try and find the most probable cause of the difficulty. Do not eliminate the possibility that the cause of the difficulty is sensory in nature and that referral to a medical professional might be required.

IMPORTANT FACTS FOR PARENTS

- ▶ Parents should have reasonable expectations for their child's abilities and for potential skill changes.
- ▶ Children with movement difficulties often do not learn so well or so quickly using conventional methods of instruction, as do coordinated children.
- ▶ Parents need to be aware that children experiencing movement difficulties require more time to learn a skill. They need constant feedback and quite often need to be physically taken through movements (kinesthetic assistance).
- ▶ Parents should be aware that some difficulties will disappear with maturity; some will not. The longer we allow inefficient physical movement to continue, such as incorrect handwriting grip, the harder it becomes to correct because the child practices poor movements which become habits, and then these have to be undone. Also, if these difficulties are left too long, some children begin to display avoidance behavior because they are not experiencing success.
- ▶ Identifying the physical problems early can result in a favorable prognosis for improvement. However, this requires consistent, cooperative, and effective intervention by the school and by parents.
- ▶ Try to make your child as independent as possible. To do this you must resist the temptation to complete the tasks for him or her, including such daily requirements as tying shoelaces, cutting food, and dressing. Instead, be there to assist your child to complete the task.
- ▶ If your child does have a specific weakness in one or two areas, we recommend that you try to spend three 15-minute sessions per week, focusing on these areas of weakness in addition to the normal home play.
- ▶ It is very important to promote the strengths of the children as well as assisting with their difficulties. You can achieve this by choosing some of the activities that you know your child is good at; for example, the child may have difficulties tying his shoelaces, but is great at cutting out shapes; therefore, do some cutting sessions or include cutting as an enrichment session.

Be patient with your child because it does take longer for children to learn skills than we think. Praise the child's efforts as well—we all need encouragement. Try to be consistent in following this program.