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MODEL FOR INDIVIDUALIZING PHYSICAL EDUCATION 
EXPERIENCES FOR THE PRESCHOOL MODERATELY 
RETARDED CHILD

DISSertation
Presented in Partial Fulfillment of the Requirements for 
the Degree Doctor of Philosophy in the Graduate School 
of The Ohio State University

By
Edwin Michael Loovis, B.A., M.A.

* * * * *
The Ohio State University 
1975

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This dissertation is dedicated to the memory of Dr. Willard P. Ashbrook. He truly was a southern gentleman, a master teacher, and a poet laureate.
ACKNOWLEDGEMENTS

The author wishes to recognize the invaluable contributions of numerous individuals; without whose assistance this task could not have been completed.

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"In spite of underachievement with respect to motor function, the mentally retarded are much nearer the norm physically than mentally" (Stein & Pangle, 1966, p. 37). Though only one of eight such "guideposts" presented by the authors, it is the one which, this researcher would suggest, serves as the primary tenet for justifying physical education and motor development programs for the developmentally delayed child regardless of age.

A coequal "guidepost", but one which for the purposes of this study will be subordinate to the previous tenet, is that in the domain of physical performance the mentally retarded can be from two to four years behind the normal child with the same chronological age (Francis & Rarick, 1959). Cratty (1966) tended to support this contention and suggested additionally that the trainable mentally retarded child was significantly lower than the child categorized as educable. Other research efforts suggest that the trainable or moderately retarded are anywhere from four to six years below the norm in physical performance (Kennedy Foundation, 1967). A more conservative estimate of the lag in motor performance abilities, i.e., two to five years, has recently been proposed by Wessel, Vogel, and Knowles (1975).

If the aforementioned research findings are creditable, it would seem inappropriate to provide children who are moderately
retarded with physical education experiences based on the curricular offerings of their normal counterparts with the same chronological age. If the research estimates are, in fact, correct and there is a two to five year delay, then it appears there are two alternatives in programming physical education experiences for pre-school children who are moderately retarded. First, the curriculum can be adapted to coincide with the child's mental age as opposed to his chronological age. However, this approach has its limitations since the selection of activities based on the needs of a normal child with a given mental age may not coincide with the needs of the developmentally delayed child with a corresponding mental age. Secondly, a singularly derived set of curriculum experiences based on an individual assessment of motoric needs can be structured. Since the child who is five years old and who may, for example, be three years behind in motoric functioning is going to need intervention in some very basic developmental skills, which the traditional physical education program is ill equipped to handle, the latter approach seems to be the logical choice when dealing with the pre-school child who is moderately retarded.

Two additional concerns generated by attempts at programming for the pre-school level are: the availability of instructional materials and the need for an individual approach to instruction. Instructional materials for use at the pre-school level are becoming increasingly accessible in a variety of academically and socially related areas (Shearer, Billingsley, Frohman, Hilliard, & Johnson, 1972; Vance, 1973). However, the same is not true for the pre-school
moderately retarded child especially in physical education. A single attempt at providing curricular materials of a gross motor nature for use by young children who are developmentally delayed is currently under way at George Peabody College (Vincent-Smith, Bogart, Dean, & Rothacker, 1974).

Regarding the need for an individualized approach to teaching at this level, it is the opinion of this investigator that attempts at teaching these children in only group situations when their primary needs are so esoteric in nature are a fundamental error of which physical educators are all too often guilty. Stein (1969) denounced the selection of activities based on the previous experiences, interests, and abilities of those planning programs. Rather, he encouraged the use of activities based on the needs of the individual or group to be served. He likewise suggested that, "many things you and I learned by being one of the kids on the block must be taught the retarded" (p. 9).

Mitzel (1970) suggests that individualized instruction will give way to adaptive education which emphasizes, "the tailoring of subject matter presentations to fit the special requirements and capabilities of each learner" (p. 463). The accent here is on the development of skills notwithstanding idiosyncratic delays.

THE PROBLEM

Statement of the Problem

The purpose of this study is to develop a model which will facilitate an individual approach to programming physical education experi-
ences for the pre-school child who is moderately retarded. In order to accomplish this goal, the study will investigate two major problems:

1. To construct a developmentally designed assessment tool which is predicated on an intra-task analysis of eleven select motor skills and which is a reliable measure of gross motor functioning.

2. To develop a performance-based curriculum which is based on behavioral objectives and consists of concomitant teaching-learning experiences and which purports to meet the psychomotor needs of the pre-school child who is moderately retarded. The curriculum, although engendered by the levels of the assessing instrument, will not teach to the particular level but will have as its primary function the acquisition of a skill to its mature, functional level.

**Delimitations**

The following limitations may have affected the results of this study: (1) the arbitrary delineation of the select motor skills into four discrete levels of performance, (2) the small number of evaluators who responded critically to the first draft of the assessing instrument, (3) the small number of judges who were available to take part in the reliability study, and (4) the limited amount of time in which to conduct the curriculum materials evaluation.

**Assumptions**

It was assumed that: (1) the tentative, performance levels described in the assessment instrument were observable components of the skills, (2) the instrument was a reliable measure of performance as it relates to the select skills, and (3) the intra-task analysis performed on the select skills lent itself to the generation of cur-
ricular items which were sequential in nature and developmentally suited for the child functioning at the assessed level.

RATIONALE

Four primary concerns contributed to the significance of this study, namely: (1) the importance of motor development especially for the young child, (2) the exigence to assess gross motor skill performance in a manner which is advantageous to program planning, (3) the acknowledged dearth of assessment tools for evaluating fundamental motor skill performance at the pre-school level, and (4) the substantiated need of physical educators and classroom teachers for a curriculum guide in motor development applicable to the young child who is moderately retarded.

In order to more clearly understand the nature and scope of this study, these four primary concerns will be discussed at considerable length.

Importance of Motor Development

The importance of motor development as a significant attribute in the ontogenetic development of man has been the subject of continual research and empirical supposition since primarily the decade of the 30's. Literature, especially in the areas of developmental psychology and child growth and development, is replete with treatise after treatise on the topic of motor development (Baldwin, 1955; Breckenridge & Murphy, 1969; Brooks, 1937; Developmental Psychology Today, 1971; Hurlock, 1964; Jersild, 1954; Landreth, 1958; Ragsdale, 1941; Rand, 1946; Shybut & Simor, 1971; Stott, 1967; Thompson, 1962). These
expositions were primarily based on the research conducted in the 30's and 40's which had as its purpose either the documentation of developmental changes over time for select motor skills or the establishment of norm referenced scales of development across many skills (Bayley, 1935; Gesell, 1940; Gutteridge, 1939; Halverson, 1937; Jenkins, 1930; McCaskill & Wellman, 1938; McGraw, 1940; Shirley, 1931).

A systematic review of the literature on motor development produces primarily four reasons why it is important, namely, socialization, emotional responsiveness, body control, and learning (cognition). This is not to suggest that these outcomes are independent -- the reverse is true -- most writers include all four in a single unitary concept.

Hurlock (1964) and Espenschade and Eckert (1967) highlighted the social and emotional aspects with emphasis on peer interaction, social approval from adults and "significant others" as well as emotional responsiveness resulting from an ability to perform at least some skills well. Baldwin emphasized:

We should not think that motor skill is unimportant; although our society does not require as highly developed motor skill of its members as do some primitive societies, it is essential for the child's adjustment to our culture (1955, p. 293).

Ragsdale (1941) and Jersild (1954) thought that the mental and social life of the pre-school child were inextricably woven. Consequently, to understand the child's life, i.e., work and play, one had to think in terms of his ability to function motorically. Stott (1967) supported this line of thought when he suggested that the first years of a child's life are the time when he gains control
of his body. This control supposedly enhances perceptions not only of himself but of things external as well. With this perception there is a concomitant self-confidence and emotional determination.

Within the last fifteen years, a new contributory dimension of motor development, i.e., its effect on cognition, has been the subject of much debate. Cratty (1969), for one, does not believe that movement is the basis of intellect. Rather, his contention is that movement is an important component of human personality and as such may be beneficial in educational programming.

Encouraged primarily by the work of Kephart and Piaget, the theory that movement is a primer facilitator of higher order cognitive functioning has been posited but as yet unsubstantiated.

Kephart launched a new era of respectability for motor development with the publication in 1960, of The Slow Learner in the Classroom. Although heavily laden with a perceptual-motor orientation, he suggested that physical education related activities, i.e., basic motor skills, are important underpinnings for more complex cognitive processes taking place in the classroom. Emphasis is placed on those skills and activities which permit the child maximum opportunity to explore his environment. Godfrey and Kephart (1969) reiterated:

- We tend to think of physical education as apart from the types of educational activities which are presented in the classroom. However, it is now time to give more attention to physical education as a process of developing basic motor patterns which can become the foundation for the more complex learnings of the classroom situation. (p. 7)
Piaget likewise emphasizes the importance of motoric behavior in his stage theory of development. The initial stage, sensorimotor, requires the utilization of basic motoric behaviors; this permits the child (age 0-2 years) to interact with the environment in a manner which is cognitively beneficial (Piaget, 1963).

The second stage of Piaget's theory is the period of concrete operations. Prior to this stage is the subperiod of preoperational thought. Characteristically, motoric behavior is not associated with this level; however, it does serve an important function, and together with the emergence of the secondary signaling system, i.e., language, it helps facilitate the development of the basic characterizations associated with concrete thought, namely, classification, seriation, temporal, and spatial relationships (Weikart, Rogers, Adcock & McClelland, 1971).

Regardless of your concept of motor development and its significance, it is important to be cognizant of a pervasive dichotomy that exists within this field of study, i.e., the difference between "the child learning to move and the child learning through movement." Lolas Halverson (1971) distinguishes between these two principles when she says:

Learning to move ... involves continuous development in ability to use the body effectively and joyfully, with increasing evidence of control and quality in movement. It involves the development of the ability to move in a variety of ways, in unexpected and expected situations, and in increasingly complex tasks. This requires more than an automatic mechanical response. Learning to move involves trying out, practicing, thinking, making decisions, evaluating, daring and persisting.
Learning through movement ... implies using movement as a means to an end, but the end is not necessarily the end of improvement in the ability of the child to move effectively. It is a means through which a child may learn more about himself, about his environment and about his world (p. 18).

Need for Motor Assessment

In general, assessment is probably the single most important process in establishing motor development programs. Three primary functions are served via assessment: (1) it helps determine the most logical starting point, i.e., where to begin intervention, (2) it is, in conjunction with number one, an invaluable aid in program planning and implementation, and (3) it can inculcate into the program an accountability system, i.e., is the program meeting its objectives.

The problem, in physical education and motor development especially as it relates to the young child, is one of gleaning from an assessment the kind(s) of information that are most beneficial. For years, individuals interested in measuring specific developmental changes over time (but not ontogenetic change over time) have had no recourse but to utilize what is referred to in the literature as a norm-referenced measure or test. In motor development, this has dictated use of normative data published originally by individuals like Bayley, Gesell, Shirley and others (see discussion of Motor Development).

Another method of assessment, probably an extension of the norm-referenced measure suggested above, has been the use of numerically derived scales and/or checklists. In this method an individual
would be graded, for example, on a scale from zero to seven. A score or check of zero would indicate an inability to perform the skill, seven might designate an excellent performance, while an intermediate score, e.g., three or four, might indicate an ability to perform the skill with some form of assistance or with some mechanically, significant deviation from the norm which is clearly visible.

Currently in education, there is a movement which is attempting to supplant the norm-referenced measure in favor of criterion-referenced measures. This latter type of assessment evaluates an individual's performance in terms of his functional level as it relates to performance of a skill that has undergone intra-task analysis and has discrete components.

Lolas Halverson (1971) summarized what the study of motor development and consequently what a criterion-referenced measure of motor development would consist of when she said:

Study in motor development ... is the study of (1) the characteristics of motor behavior, (2) how these characteristics may change over time as a result of maturation and experience, (3) how these characteristics may change under differing environmental situations (p. 18).

Assessment Tools in Physical Education

At the Study Conference on Research and Demonstration Needs in Physical Education and Recreation for Handicapped Children held in 1969, physical educators were given a charge to develop diagnostic and evaluative instruments which would effectively measure the performance of young children (6 years and under) as well as children performing at low functional levels. A cursory review of the liter-
nature reveals that in the six years that have elapsed, there has been literally nothing published in the area of gross motor skills assessment (IRUC, 1974; Geddes, 1974).

At this same Study Conference, physical educators were likewise encouraged to develop new testing instruments which would hopefully remedy the practice of modifying existing tools or using instruments which were originally designed for other purposes. This charge has also been ignored. Physical educators continue to utilize norm-referenced measures, e.g., The Bayley Scales of Infant Development, or at best modifications of these instruments in the form of tests like the Denver Developmental Screening Test.

Tests, which are frequently used by physical educators working with mentally retarded populations, include the Purdue Perceptual Survey Rating Scale, the Special A.A.H.P.E.R. Fitness Test, and the President's Council Fitness Test (Ersing, 1974). Although the aforementioned tests are useful with older (six and above) children who are moderately retarded, there utility with children (six and under) is negligible. Additionally, these tests are not measures of gross motor skill performance which is where the need for assessment devices exists.

Need on Part of Practitioners

After studying the nature of physical education programs in the county programs of Ohio, Loovis (1971) suggested that a curriculum guide in the area of physical education programming for the moderately retarded was needed. The current study has been proposed
for several reasons not the least of which is the need for such a curriculum guide.

An overriding influence in this initial attempt at writing a curriculum in physical education for the moderately retarded pre-school child has been the encouragement of the Division of Mental Retardation, State Department of Mental Health and Retardation. This group which is cognizant of the need for such a study has pledged its total support.

After considering the diverse professional backgrounds of those teaching physical education in the county programs of Ohio, a decision was made to write the curriculum in behavioral form. Many of the county programs hire individuals who are trained as traditional physical educators, while other programs hire people with little or no training in physical education. Whatever the case, many of these individuals are unaware of the developmental gross motor sequences in younger children, i.e., one to five years of age, and consequently, they would be unable to program appropriate teaching-learning experiences. Hopefully, this curriculum will permit them to operate more professionally and proficiently.

Definitions

The following terms are used in the study and are therefore clarified at this time:

1. **Behavioral Objective** - see Instructional Objective.

2. **County Programs** - those community programs administered by the local 769 boards and which provide training and educational experiences for the moderately retarded population.
3. Curriculum - a series of materials from which a program is selected individually for each child (Grotman, 1970).

4. Educational Objective - see Instructional Objective.

5. Instructional Objective - an objective which identifies a terminal behavior, describes the conditions under which the behavior will occur, and specifies the criteria for acceptable performance (Mager, 1962).

6. Mental Retardation - refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, and manifested during the developmental period (Grossman, 1973).

7. Moderately Retarded - a term used to describe the degree of mental retardation when intelligence testing scores range between 3 and 4 standard deviations below the norm (36 to 51 on the Stanford-Binet and 40 to 54 on the Wechsler Scales); many trainable individuals function at this level; such persons usually can learn self help, communication, social, and simple occupational skills but only limited academic or vocational skills (Grossman, 1973).

8. Performance-Based - curriculum which is based on the application and implementation of instructional objectives.

9. Pre-school Child - a child ranging in age from 3 to 6 years.

10. Trainable Mentally Retarded - used interchangeably with moderately retarded.
CHAPTER II

SURVEY OF RELATED LITERATURE

The dichotomous nature of this study, namely, the development of an instrument, based on intra-task analysis, to assess gross motor skills and the subsequent generation of a performance-based curriculum, has determined the content of the related literature contained in this chapter. First, an attempt will be made to highlight pertinent information relating to assessment and instruments designed for that purpose which endeavor to measure gross motor skills. Emphasis will be on the assessment of pre-school age children. Secondly, relevant information and research findings pertaining to the eleven fundamental gross motor skills chosen for inclusion in the assessing instrument and curriculum will be discussed. Thirdly, an examination of curricula which are currently available to professionals interested in programming motor experiences for the retarded child will be presented. Finally, a cursory review of the literature as it pertains to curriculum development and more specifically how it relates to the use of behavioral objectives in the process will be analyzed.

Assessment and Screening Devices

With the rapidly expanding interest not only in pre-school education but also the recent impetus to extend formal education downward into the infant years (0 to 3), there has been a concomitant interest in assessing capacities and capabilities (Guthrie, 1971). Olion and Rodabaugh (1974) expanded upon the previously mentioned work; their emphasis was on detection of children who were potential "developmental risks." The authors also performed an im-
portant service by differentiating between screening and assessment instruments; they concluded that:

Screening instruments are relatively short, of surface nature, and indicate the possibility of a variance in development. Assessment instruments are more lengthy, of an in-depth nature, and analyze the problem and make differentiations -- not on screening results (p. 2).

The interest in obtaining information relevant to programming educational experiences for young children has led to the inclusion of "checklist" types of evaluations embodied in or closely allied to curriculum offerings (Shearer et al., 1972; Southeastern Day Care, 1973). For the most part, these checklists are attempts to measure numerous areas, i.e., cognition, self-help, motor, language, and socialization; consequently the attempts are, at best, cursory.

In an effort to exemplify the kind of nondescript measures of development, especially motor, with which one is currently forced to work, this researcher has identified twenty-one such instruments. Some may be extremely well known and popular, while others may be less popular and inconspicuous. What they all have in common is that each attempts to utilize in one form or another some fundamental gross motor skill(s). What follows is a brief abstract of each instrument with special reference to their utilization of fundamental gross motor skills.

Assessment of Behavior Rating. This is a diagnostic instrument developed for use by Head Start Programs on the Indian reservations in Arizona. It was designed to assess three, four, and five year old children suspected of being developmentally delayed, emotionally disturbed, or learning disabled.
The test purports to assess four areas: physical development, self-help skills, language development, and social-emotional development. The child is assessed according to his performance on a scale of five possible behaviors. Five gross motor skills are considered, namely, running, skipping, jumping, climbing, and throwing. The five categories of behavior are basically nondescript, i.e., the skill is either not performed, performed poorly, or performed very well (Sharp, 1973a).

Communicative Evaluation Chart. Designed for use with children from three months of age to five years, this checklist is a simple assessment tool which purports to provide enough information relative to the child's abilities in language and performance to make decisions on referrals to appropriate clinical services for further evaluations. The instrument is intended for use by numerous specialists from diverse fields.

Communication skills, i.e., language and audition, as well as physical growth and motor development are assessed. The description and outline of the gross motor skills are reminiscent of Gesell, e.g., at age two, kicks large ball and at age three, can tip toe and keeps balance (Anderson, Miles & Matheny, 1963).

DIAL. Developmental Indicators for the Assessment of Learning was a specially funded project in the State of Illinois which had as one of its objectives the development of an acceptable set of evaluative criteria for identifying potential learning problems in children ages 0-6 years. Six areas were identified for inclusion in this screening
instrument, namely, sensory, gross and fine motor, affective, social, conceptual, and language, i.e., receptive and expressive.

Gross motor items included: balance as it relates to performance on a walking board, throwing, catching, jumping, hopping, skipping, and standing still, i.e., a measure of motor control. Emphasis was placed on some quantitative performance measure and not on the qualitative aspects of the performance (Learning Disabilities Research Project, 1972).

Developmental Profile. This inventory of skills was designed to assess development from birth to pre-adolescence. It purports to yield information on five skill categories in a short period of time, i.e., 20-40 minutes, and it does not require a trained clinician.

The five areas included in the profile are: physical, self-help, social, academic, and communication. These skills are arranged normatively and correspond to the child's chronological age. Although the gross motor sections ask some good questions, e.g., Does the child catch a ball (any size) thrown by an adult standing five feet away?, the descriptions of performance do not relate developmental change over time (Alpern & Boll, 1972).

Developmental Screening Questionnaire. This instrument like the Assessment of Behavior Rating was developed by Elizabeth Sharp for use on the Indian reservations in Arizona. It proposes to identify children with mental, speech, sensory, emotional, physical, or developmental learning problems.
This screening tool has a separate form for three, four, and five year old children. Each form asks questions which attempt to uncover problems in the aforementioned areas; these questions are normative in nature. An example of a gross motor item is: Can he throw a ball without losing his balance (Sharp, 1973b).

**Magnolia Motor Skills Battery.** The production of the Magnolia Motor Skills Battery and its collateral curriculum was an attempt to develop a set of meaningful activities for five year old children with problems. Seven areas were examined: stationary balance, crawling, rail walking, start and jump, catching and throwing, and skipping.

A few skills are vaguely described in terms of their ontogenetic development, e.g., crawling, but the criteria for an acceptable performance are quantitatively constructed. Additionally, a range of performance criteria are acceptable, which seems to equate performance, provided the task is accomplished at criterion level (Curriculum Guidelines, 1972).

**Developmental Assessment Scale.** The Developmental Assessment Scale for Preschool and Primary Children was developed to assist teachers in determining the most beneficial place to enter the curriculum. Hopefully, this would permit the teachers to better meet the needs of the individual child. It covers the years one through seven and examines the following four areas: gross motor, visual retention and discrimination, auditory discrimination and retention, and language.

Each of the areas is broken down into tasks which are representative of that area at a given age, e.g., 1 year, 3 years, 7 years; the
items therefore are normative by design. Gross motor items include:

<table>
<thead>
<tr>
<th>Age</th>
<th>Skill Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>one year</td>
<td>Stands alone</td>
</tr>
<tr>
<td>two years</td>
<td>Can run</td>
</tr>
<tr>
<td>three years</td>
<td>Walks upstairs</td>
</tr>
<tr>
<td>four years</td>
<td>Strong overhand throw of ball</td>
</tr>
<tr>
<td>five years</td>
<td>Catches a bounced ball</td>
</tr>
</tbody>
</table>

(Morshead, n.d.).

Preschool and Kindergarten Performance Profile. Designed to identify behaviors of a physical, social, and intellectual nature (as well as various sub-categories of each area), the profile makes judgements about levels of individual development that have been attained. It is an evaluative scale of the child's performance based on direct observation by the teacher. The instrument is heavily weighted with the "developmental task" concept as originated by Havighurst.

Four gross motor skills are used as indicators of proficiency in the category, physical skills. They are throwing, catching, running, and stair climbing. Each skill is divided into seven criterion levels, and these levels along with the subjective opinions of the raters determine the child's placement in a given skill. For example, catching is evaluated with the following criteria:

0 - Negative or non-performance
1 - Attempts to catch ball, but shows obvious fear
2 - Positions hands, but frequently misses ball
3 - Can catch only a gently thrown ball
4 - Can catch a ball thrown from a distance of 20 feet
5 - Gauges direction of ball, moves toward it, and catches it
6 - Catches skillfully while running (DiNola, Kaminsky, & Sternfeld, 1970a).
**Lincoln-Oseretsky Motor Development Scale.** This test was designed to measure the motor ability of children between the ages of six and fourteen years. The test which is supposed to be administered individually contains thirty-six items which purport to measure finger dexterity, eye-hand coordination, and gross activity in the arm, legs, and trunk.

The fundamental motor skills assessed are: walking (backwards), jumping, catching (single handed), and throwing. Emphasis is on quantifiable measures of performance, i.e., distances, seconds, etc., and not on how the skill is performed from a developmental standpoint (Sloan, 1955).

**Pre-School Curriculum.** Since the Pre-School Curriculum (Pre-school Disability, Identification and Prevention) is written in behavioral terms, it can be utilized as an evaluative instrument especially on a day to day basis. Designed for children who have been identified as potential learning disabled, it proposes to enhance certain critical content areas prior to entrance into the primary grades.

The content areas are: language, pre-reading and reading skills, mathematics, and preceptual-motor. Included in the preceptual-motor area are: balance and strength activities, throwing, catching, hopping, skipping, and jumping. Notwithstanding the use of behavioral objectives, the skills do not contain a description of ontogenetic development with the exception of catching which mentions only that the child should catch in his hands and not his arms (Pre-School Curriculum, 1973).
Cooperative Preschool Inventory. This screening device was designed for use with children ranging in age from three to six years. It is intended for use on an individual basis and proposes to measure achievement in areas considered important for success in school. The following areas are assessed: knowledge of child's personal world, personal-social responsiveness, associative vocabulary, number concepts, awareness of sensory attributes, and ability to execute visual motor configurations.

The Preschool Inventory is used as an example of an instrument which makes very little use of motor skills as an indicator of possible delay. It has only one motor task out of sixty-four possible items; item #10 is "Jump." It calls to the attention of the examiner that credit for jumping is predicated on both feet leaving the floor "at least a little bit" (Caldwell, 1970).

T.M.R. Performance Profile. The T.M.R. Performance Profile for the Severely and Moderately Retarded is used to identify behaviors in six major areas: social behavior, self-care, communication, basic knowledge, practical skills, and body usage. It is an evaluative scale of an individual's performance based on direct observation by the teacher.

Nine gross motor skills are used as indicators of proficiency in the category, body usage. They are: stair climbing, kicking, throwing, hopping, jumping, skipping, catching, running, and ladder climbing. Each is divided into five criterion levels, and these levels along with the subjective opinions of the raters determine the child's
placement in a given skill. For example, hopping is evaluated with the following criteria:

- 0 - Does not hop even with aid
- 1 - Hops distance only with aid
- 2 - Hops distance unaided but breaks pattern
- 3 - Hops distance unaided
- 4 - Hops freely in both straight line or circle patterns

Stair climbing and ladder climbing were partially written in ontogenetically descriptive levels (DiNola et al., 1970b).

Valett Developmental Survey. The Survey of Basic Learning Abilities was developed to assist professionals in planning prescriptive programs for children between the ages of two and seven years who are suspected of having developmental or learning disabilities. Assessment is conducted on seven ability areas: motor integration and physical development, tactile discrimination, auditory discrimination, visual-motor coordination, visual discrimination, language development and verbal fluency, and conceptual development.

In the Motor Integration and Physical Development Section, the child is asked or directed to perform certain gross motor tasks, e.g., Run in a circle, Throw me the ball, Skip around me. In each case, the evaluator merely scores "1" point for a correct performance, "0" points for incorrect performance and "½" point for an awkward or poor performance. Neither "correct" nor "incorrect" are defined. Emphasis is on task completion (Valett, 1966).

Y.E.M.R. Performance Profile. The Profile for the Young Moderately and Mildly Retarded purports to identify behaviors in ten domains: social, self-help, safety, communication, motor skills, manipulative
skills, perceptual and intellectual development, academics, imagination and creative expression, and emotional behavior. It is an evaluative scale of the individual's performance based on direct observation by the teacher.

The following motor skills are assessed: walking, running, jumping, stair climbing, hopping, skipping, catching, throwing, and kicking. Each skill is divided into five criterion levels, and these levels along with the subjective opinions of the raters determine the child's placement in a given skill. For example, jumping is evaluated with the following criteria:

0 - Negative or non-performance
1 - Can jump up and down from a standing position only with assistance
2 - Can jump with assistance but awkwardly
3 - Maintains balance while jumping
4 - Displays sureness of movement
5 - Jumps in games and races appropriately
6 - Jumps skillfully in games and races

(DiNola et al., 1967).

Denver Developmental Screening Test. Devised to provide a simple method of screening for evidence of slow development in infants and pre-school children (to age 6), the test examines four functions: gross motor, language, fine motor-adaptive, and personal-social skills. The test is not diagnostic but is only intended to alert the examiner of the possible presence of a developmental problem which needs further investigation.

All sections of the test are normatively constructed with four indicators available for each skill, i.e., the age when 25%, 50%, 75%, and 90% of the normal population performs the skill(s). In the gross motor section the following skills are examined: walking, stair climb-
ing, kicking, throwing, jumping, hopping, and catching as well as some earlier developmental milestones, e.g., pre-walking skills. The test emphasizes the emergence of the skill at the appropriate time developmentally; it is not interested in how the task is performed (Frankenburg & Dodds, 1967).

Bayley Scales of Infant Development. The Bayley Scales, which have separate mental and motor sections, are considered a secondary screening and assessment procedure for use with infants and young children (birth to 30 months). Since the Bayley is heavily weighted with sensori-motor items, i.e., functioning at this age is primarily sensori-motor, its validity as a predictor of future intellectual functioning is low (Meier, 1973).

The scales are normative; the motor section has eighty-one items. The first forty items measure early neonatal development and the pre-walking skills. At 9.6 months the scales begin to measure the following gross motor skills: walking, throwing, stair climbing, jumping, and hopping. With the exception of stair climbing which is explicated in terms of its ontogenetic development, the remaining skills are evaluated in terms of quantifiable performance criteria, e.g., jumps 14 to 24 inches (Bayley, 1969).

CCD Developmental Progress Scale. This screening device which is similar to the Denver Developmental Screening Test in design, content, and purpose purports to identify skills which might be below normal. Unlike the Denver this scale has three major areas: motor skills, interpersonal-communication skills, and self-sufficiency skills; it likewise serves a larger age range, namely, birth to eight years.
The motor section, a combination of gross and fine motor tasks, contains fifty items; of the fifty only seven assess fundamental gross motor skills. There is one item for each of the following: walking, jumping, throwing, hopping, and catching; there are two items for stair climbing. The remaining forty-three items screen many of the pre-walking skills and tasks like, Plays outdoors safely and Arranges materials neatly (Boyd, 1973).

Physical Ability Rating Scale. This scale was designed to measure "essential" motor skill performance in children with physical handicaps who attend the University of Iowa Hospital School. Upon entering the hospital, the child is assessed to determine his current level of functioning; he is re-assessed at three month intervals to establish his on going status. The scale is interested in two areas; Activities of Daily Living, i.e., fine motor tasks, and Basic Activities, i.e., gross motor tasks. All items are arranged in order of their normal developmental sequence.

The ordering of the gross motor items is reminiscent of the early normative studies by Bayley and Gesell. Gross motor skills include: jumping, ladder climbing, walking, stair climbing, skipping, and hopping. Like the other normative scales, this instrument stresses the quantitative aspect of performance only (Marx & Healy, 1971).

Kiddy Key. The Kiddy Key proposes to evaluate delays in some select gross motor tasks; it is designed for use with infants and young children who are developmentally delayed. Ten areas are assessed: early head and trunk control, rolling over, later head and trunk control,
crawling, sitting balance, creeping, kneeling, half-kneeling, to standing, cruising, and walking.

Beginning with kneeling, the instrument delineates a functional intra-task analysis of the skill of walking. Not only does the instrument facilitate evaluation but it also provides teaching-learning experiences to promote skills which are evidencing delay (Angle, 1972).

**Gesell Developmental Scales.** The Gesell Developmental Scale is a normative approach at diagnosing normal and abnormal behavior in young children (birth to 3 years). Four major behavioral domains are examined: motor, adaptive, language, and personal-social. Each domain is then analyzed in terms of some key developmental ages, namely, 4, 16, 28, 40 weeks and 12, 18, 24, and 36 months.

The motor section begins at the four week level with a description of head control and concludes at the three year level with an assessment of stair climbing and jumping. During the intermediate months walking, running, throwing, and kicking are evaluated (Gesell and Amatruda, 1974).

**Peabody Developmental Motor Scales.** The Peabody Developmental Motor Scales (Folio & Dubose, 1974) are an experimentally designed set of indices which purport to assess gross and fine motor skills in children from birth to seven years of age. The Scales are the result of the blending of various normative scales and tests. The gross motor section contains 205 items all normatively arranged.

Five criteria are provided which classify the amount of assistance required by the child to perform each task; this ranges from total
support to complete independence. For each item the scale consists of a description of the behavior and a direction-scoring section which further specifies the behavior to be expected and the level of assistance required.

Beginning with the nine month section and continuing until the sixth-seventh year section, the following skills are evaluated: walking, stair climbing, kicking, throwing, running, jumping, ladder climbing, catching, skipping, and hopping.

Summary

Twenty-one screening and assessment devices which were either entirely motor in nature or which used at least one motor item were presented. As a result of this review, it was possible to characterize the tests as follows: (1) those which were based on normative data (Alpern & Boll, 1972; Anderson et al., 1963; Bayley, 1969; Boyd, 1973; Folio & Dubose, 1971; Frankenburg & Dodds, 1967; Gesell & Amatruda, 1971; Marx & Healy, 1971; Morshead, n.d.), (2) those which utilized a checklist approach, i.e., the skill was either performed or it was not (Caldwell, 1970; Learning Disabilities Research Project, 1972), (3) those which were constructed as numerically graded scales, i.e., numbers corresponding to a level of performance (DiNola et al., 1967, 1970a, 1970b; Sharp, 1973a, 1973b; Sloan, 1955; Valett, 1966), and (4) those which were based on behavioral objectives (Angle, 1972; Curriculum Guidelines, 1972; Pre-School Curriculum, 1973).
Fundamental Motor Skills

This section attempts to explain how the skills, selected for inclusion in the proposed assessment instrument, were analyzed, i.e., intra-task analysis. Emphasis will be on the literature which supports the concept of performance levels.

According to Halverson, Roberton, and Harper (1973), "motor development is the study of ontogenetic change in human movement." With this in mind, it then becomes inconsequential to speak of a child walking or jumping but rather "how" his performance in a particular skill changes over time and "how" he is currently performing the task.

**Walking.** Godfrey and Kephart (1969) define the walking pattern as, "a repeated loss and recovery of balance in a forward direction employing simultaneous movements of the opposite leg and arm alternately" (p. 404). Push off with one leg is coordinated with the heel strike of the other so as to maintain support with either one or both legs (Wickstrom, 1970).

When conceptualized developmentally, walking proceeds through numerous stages not the least of which is learning to stand. McGraw (1940) has outlined seven stages which culminate in the assumption of an erect standing posture. An outcome of her research has been the fact that children can walk alone even before they can independently rise to an erect position. Emphasis here is on maintenance of the erect position for a given period of time in addition to achieving voluntary control over the anti-gravity mechanism.

The next major stage of walking is cruising where the child walks laterally while holding on the furniture (Shirley, 1933; Gesell &
Amatruda, 1974; Breckenridge & Murphy, 1969). Cruising is performed in a single direction at any one time and therefore utilizes an ipsilateral stepping pattern in that direction (Angle, 1972).

Shirley (1933), Bayley (1935), and Gesell (1940) have described the variations in the walking pattern of young children. Interest has centered around such developmental issues as postural control, base of support, and reciprocal arm movements.

Relative to synchronous movements of the upper extremities, there appears to be a discrepancy as to when these actions make their appearance. McGraw (1940) has delineated a "mature phase" of erect locomotion during which synchronous arm action is associated with movements in the opposite lower extremity. This phase is not usually established until the child's third year although it is observable in some by the end of the second year. Burnett and Johnson (1971) were able to distinguish synchronous movements of the arms at 18 months in subjects who were walking. With this and some additional information gleaned from their study, they have hypothesized the emergence of an adult pattern of gait significantly earlier than generally accepted.

Running. Slocum and James (1968) have described running as, "a series of jumps in which the body is alternately supported first on one foot and then on the other" (p. 721). This description is viable in terms of the criteria use to differentiate running and walking. The following principle is used to describe a mature run: the absence of a period of double support and the presence of a period of total non-support (Broer, 1973; Cooper & Glassow, 1968; Rasch & Burke, 1963; Steindler, 1935).
Normally, children begin to show signs of acquiring the skill of running at approximately 18 months of age. Burnett and Johnson (1971) suggest that attempts at running can be seen as early as 14.5 months; they observe, however, that these first attempts are characteristic of an immature walk. Espenschade and Eckert (1967) indicate that this is not a true run, but a modification of the child's normal walking gait. Halverson (Personal Interview, 1975) indicates that this stage is characterized by a relatively fast and continuous knee-lift action.

The earliest definitional stage of running is characterized by an outward swing of the knee on the recovery or nonsupport leg. Associated with this movement of the leg is a toeing-out of the foot of the recovery leg. Since an increase in speed and maneuverability produces a precarious balance situation at this time in the child's development, the arms are maintained in a middle to high guard position and act in a stabilizing manner (Wickstrom, 1970).

Further into the developmental sequence, there is considerably less outward rotation of the knee and toeing-out of the foot. However, an increase in trunk rotation now causes the foot of the recovery leg to cross the midline of the body before swinging forward. Arm movements at this stage parallel those of the legs, e.g., when the legs are relatively straight, the arms are also straight and when the stride is short, the arc of the arm swing is diminutive (Wickstrom, 1970).

Running is a very dynamic skill; consequently, it is extremely difficult (if not impossible) to observe its key component, the period of nonsupport. The only guideline, which has heretofore been given
as a means of evaluating mature running in youngsters, comes from Fortney (1963) who says:

In observing a child run a possible way to distinguish the good from the poor would be to identify those with the high heel kick-up at contact and those with a leading thigh close to the front horizontal at the beginning of the flight (p. 119).

**Hopping.** Hopping is defined as the projection of the body off the ground by the action of a single leg with the landing made on the same leg (Espenschade & Eckert, 1967). Hopping on two feet precedes the ability to hop on one foot; this normally involves the ability to make consecutive hopping movements on two feet (Gutteridge, 1939; McCaskill & Wellman, 1938; Wellman, 1937).

In similar fashion one foot hopping was classified not in terms of its ontogenetic development but rather on the number of consecutive hops performed. Recently some research has been conducted at the Wisconsin Child Study Center which attempts to explicate some tentative levels of ontogenetic development in hopping.

Initially, the child raises the arms to a middle guard position, i.e., arms to chest level with arm on side of nonsupport leg out to the side, and he raises the nonsupport leg as high as possible with knee out to the side simultaneous with arm movement. He then straightens the knee and ankle of support leg in an attempt to hop; however, he does not leave the floor (Halverson et al., 1973).

In the subsequent level the child holds the arms in the high guard position, i.e., bent arms to shoulder level with arm on side of nonsupport leg out to the side. Child holds bent nonsupport leg off the floor with the knee at approximately waist level. The child
then lifts foot of support leg off the floor and quickly returns it (Halverson et al., 1973). Halverson (Personal Interview, 1975) contends that what appears to be happening at these intermediate levels is a rolling over the metatarsophalangeal joint which causes a constant loss and regaining of balance when hops are done in succession.

In order to lift the body off the floor in a mature hop, the child swings the arms forward and upward synchronously with the lifting of the nonsupport leg and the straightening of the support leg. At this level the take off becomes totally an extension pattern whereas in previous levels the pattern that predominated was one of flexion. Likewise the nonsupport leg becomes an active participant in the lifting process instead of just remaining fixed in front of the body (Halverson et al., 1973).

**Throwing.** Throwing is defined as propelling an object with the use of the hands or the hand and arm (Godfrey & Kephart, 1969). Throwing with two hands is a prerequisite to one hand throwing (Gutteridge, 1939).

The premier study of the ontogenetic development of throwing was conducted by Monica Wild in the 1930's. Wild's patterns of one hand throwing are summarized as follows:

- **Level I:** The arm swing is in the anterior-posterior plane; there is no trunk rotation, and the feet remain stationary.
- **Level II:** The arm swings in a flat or oblique plane; there is trunk rotation, but the feet remain stationary.
- **Level III:** The arm swings in a flat or oblique plane; there is trunk rotation, and the foot on the side of the throwing arm moves in the direction of the throw.
- **Level IV:** The arm swings in the horizontal plane; there is trunk rotation, and the foot on the side opposite the throwing arm moves in the direction of the throw. (Wild, 1938; Wickstrom, 1970).
Catching. According to Godfrey and Kephart (1969), catching refers to "receiving a moving object with the hands and arms and retaining control of it" (p. 131). In 1950, Deach (See Wickstrom, 1970) described the initial attempt at catching which is characterized by a fear reaction and results in the child's arm extending straight in front of his body, the head turning away, and the body leaning backward.

The next stage of catching features an engulfing or embracing action of the arms around the ball. This resembles and is commonly called the "scoop" catch (Gutteridge, 1939; McCaskill & Wellman, 1938; Wellman, 1937; Wickstrom, 1970). This catching movement has two variations: the flexing of the arms as the ball contacts the arms and/or hands and pulling it into the chest or the flexing of the arms prior to the ball contacting the arms and culmination with the ball pinned to the chest (Seefeldt, Reuschlein, & Vogel, 1972).

Another intermediate level of catching consists of lessening the body as a contributory mechanism and increasing the reliance on the hands to perform the major catching function. The elbows are held in front of the body in such a way that the forearms are parallel to the body. The ball is then trapped between the hands with a "clapping" action or motion (Gutteridge, 1939; McCaskill & Wellman, 1939; Seefeldt et al., 1972; Wellman, 1937; Wickstrom, 1970).

A mature catch utilizes the arms bent at the elbows and positioned at the sides of the body (McCaskill & Wellman, 1938; Wellman, 1937). The hands which are now cupped will perform different functions depending upon the trajectory of the ball, i.e., above the waist, the thumbs
will be in close proximity; below the waist, the little fingers are adjacent (Wickström, 1970).

**Jumping.** Jumping is defined as a movement through space starting with a two foot take off and ending on either one or two feet (Sinclair, 1973). In 1945, Wilson concluded that there were seemingly no developmental stages in the acquisition of jumping behavior. She was, however, observing both vertical and horizontal jumping which could have produced spurious results.

Contrary to that belief, it has been tentatively established that jumping has an ontogenetic sequence. It begins with stepping down from an elevation. This task is performed in the following sequential manner: stepping down - back foot remains stationary until front foot is firmly in place on floor, stepping down - both feet are momentarily and simultaneously nonsupported, and jumping down - two foot take off and landing (Gutteridge, 1939; Hellebrandt, Rarick, Glassow & Carns, 1961; Wellman, 1937).

Hellebrandt et al. (1961) reported that the first legitimate attempt at jumping looks like a two foot hop, i.e., the vertical component was equal to or greater than the horizontal component. Since the arms are maintained at the sides of the body, their contribution is negligible.

During subsequent attempts at jumping, there is an obvious hyperextension of the arms in the direction opposite to the line of flight. This has been referred to as "winging." In time "winging" is replaced by attempts at swinging the arms forward during the propulsive phase of the jump. Although not especially common, the forward
arm thrust can cause an extreme loss of balance which requires a compensatory all fours landing. Regression to landing on one foot or an alternate two foot landing instead of a simultaneous two foot landing is the more common characteristic at this level (Hellebrandt et al., 1961; Wickstrom, 1970).

The mature horizontal jump is characterized by extension of the lower extremities simultaneous with the synchronous movement of the arms forward to a position overhead. In flight the lower legs and hips flex bringing the knees forward in preparation for landing; the arms drop anteriorly to assist with balance on landing (Hellebrandt et al., 1961; Seefeldt et al., 1972; Wickstrom, 1970).

**Kicking.** Godfrey and Kephart (1969) define kicking as,

...a propulsive pattern in which the leg or foot is used to strike a resting or moving object for the purpose of sending it somewhere or deflecting it away from oneself (p. 123).

Initially, attempts at kicking either a stationary or a moving ball are made at approximately 18 months of age (Gesell, 1940). It is primarily a case of making contact with the ball as part of the running or walking pattern (Wickstrom, 1970).

In 1950, Deach (Wickstrom, 1970) observed and documented four stages of development in kicking. The first stage is characterized by neither a backswing not any appreciable follow-through; the foot is merely planted underneath the ball and is used as a wedge to lift it off the floor.

Stage two utilizes for the first time flexion at the knee joint to cock the lower leg in preparation for the kick. In the third stage
there is a combination of flexion in the lower leg and extension at
the hip to facilitate a greater arc through which the kicking leg
will travel (Wickstrom, 1970).

More effective knee flexion and hip extension as well as back­
ward inclination of the trunk which is a consequence of a more
forceful kick than that seen in level three are the hallmarks of the
fourth stage of kicking. Additionally it should be acknowledged that
if the kicker is required to run at the ball; he will most likely
"kick-through" the ball and ultimately land on the kicking foot. If
running is not encouraged and if kicking is attempted while walking
or standing still, the kicker will typically retract the kicking
leg and place it next to the support leg (Wickstrom, 1970).

Striking. Striking ("hitting" according to Godfrey & Kephart,
1969) is "giving momentum or impetus to an object by swinging or
striking at it with the hand, arm, or an implement held in the hand or
hands" (p. 122).

Halverson and Roberton (1966) observed the single-handed striking
pattern which is performed in the anterior-posterior plane; the swing
consists primarily of an extension of the forearm and a step with the
ipsilateral foot. The authors likewise suggested that children with
more mature patterns of motor behavior will resort to less mature forms
of the same pattern in order to avoid learning new movement patterns
which could cause frustration and reduce success experiences. Relative
to striking behavior, this means resorting to single-handed striking.

When the child finally acquires a two hand placement on the bat,
he faces the object; his feet remain stationary, and he swings in a
vertical plane, i.e., a chopping motion. In its next stage, striking begins to approximate the mature swing. The child is beginning to swing in a sidearm manner although it is still primarily oblique. There is likewise a concomitant shifting of his weight in the direction of the swing; this is not, however, a step but a rocking action over the feet (Wickstrom, 1970).

The mature swing is the integration of five primary movements executed as a unitary pattern. Initially, the weight is shifted to the back foot in preparation for the swing. Next, a step-shift is made in the direction of the swing. Accompanying the step-shift is a rotation of the hips and body. The swing is executed in a sidearm manner, and the swing is continuous, i.e., follow-through (Sinclair, 1973; Wickstrom, 1970).

Skipping. Skipping is a combination of two movement patterns; walking and hopping. This combination produces the characteristic step-hop action of skipping (Godfrey & Kephart, 1969).

Although both appear late in the developmental sequence, Gutteridge (1939) observed that the emergence of galloping preceded skipping. She likewise observed that the first legitimate attempts at skipping consisted of inserting a hop or a jump into the normal running pattern. Wellman (1937) identified a "shuffle" which was evident prior to specific skipping attempts.

An intermediate stage in the development of skipping consists of performing the skip on one foot while the other foot continues with either the normal walking or running pattern (Gutteridge, 1939;
McCaskill & Wellman, 1938; Wellman, 1937). Along with the inability to perform the skip bilaterally, there is the manifestation of "jerky" or extraneous movements (Godfrey & Kephart, 1969).

The mature skip is characterized by bilateral, alternation of the skipping pattern (Gutteridge, 1939; Wellman, 1937). Arm and leg opposition similar to walking or running is present also (Godfrey & Kephart, 1969; Sinclair, 1973).

**Stair Climbing.** Children have the facility to negotiate stairs, i.e., in a creeping posture, some two months prior to acquiring the ability to walk alone (Shirley, 1933). As such identification of initial stair climbing behavior is a description of the creeping pattern.

When independent walking is established and when the child begins to explore the stair climbing task, ascending behavior which is less difficult at each level consists of a "mark-time" pattern, i.e., leading with the dominant foot and landing with two feet on each step. Descending behavior is performed in the same manner or by sliding from step to step on the buttock or creeping down backwards (Espenshade & Eckert, 1967).

At subsequent stages of stair climbing, ascending behaviors continues to be more advanced than descending behaviors. The child next ascends using an alternate stepping pattern but descends using a "mark-time" method; in the final stage ascending and descending behaviors are both done alternately (Bayley, 1935; Gutteridge, 1939; McCaskill & Wellman, 1938; Wellman, 1937). Utilization of support
structures, e.g., a railing or a wall, differs according to the length of the stairs (Wellman, 1937) and the height of the risers (Gesell & Thompson, 1931).

Ladder Climbing. According to Eckert (1973), skill in ladder climbing is similar to stair climbing in respect to the nature of the ascending and descending behaviors, but it lags behind the latter developmentally. As in stair climbing, ascending is less difficult, and the mature form of ascending is accomplished much earlier than descending (Gutteridge, 1939; McCaskill & Wellman, 1938).

The levels of ladder climbing behavior parallel exactly the levels of stair climbing: ascending and descending marking-time, ascending alternately and descending marking-time, and ascending and descending alternately (Bayley, 1935; Gutteridge, 1939; McCaskill & Wellman, 1938; Wellman, 1937).

As the nature of the climbing task changes, it can produce changes in the level of performance. The following environmental arrangements can produce alterations in the climbing pattern: the length of the ladder, the distance between the rungs, and the angulation of the ladder against the wall (Espenschade & Eckert, 1967).

Summary

The literature on motor development which was used in the process of intra-task analysis for this study was reviewed. With the exception of the first level of ladder climbing, the literature substantiates, at least tentatively, the concept of performance levels or developmental changes over time as suggested by Halverson et al. (1973).
This section examines curricula which are currently available to physical educators, classroom teachers, and others who are interested in programming motor experiences for the child who is moderately retarded. Emphasis is directed at the pre-school level where possible.

**I CAN.** The I CAN project (Wessel, 1975) at the Michigan State University developed a structured physical activity curriculum for children in the primary through intermediate grade levels, i.e., ages 5-8 and 9-12 respectively who are moderately retarded. The curriculum utilizes a system approach with teaching-learning experiences for each behavioral objective.

Within two of its four performance areas, namely, body management and fundamental skills, the I CAN curriculum examines ten fundamental motor skills: walking, running, jumping, hopping, skipping, throwing, catching, kicking, striking, and stair climbing. Enabling objectives are written in terms of the terminal behavior, i.e., the mature functional level of the skill. These serve as the competency measures or assessment criteria; deviations from the terminal behavior are considered diagnostic and serve as indicators for accessing the curricular components of that enabling objective.

**Sequenced Instructional Program.** Carr and Avance (1973) developed a curriculum in physical education for use with children from preschool age through high school who are physically and mentally handicapped. To facilitate its use by teachers and students, a dominant
audio-visual component has been built into the curriculum consisting of 75 single concept 8 mm film loops and accompanying audio cassettes.

The curriculum guide defines five performance areas; one of these is concerned with the development of the following fundamental motor skills: walking, running, jumping, hopping, skipping, throwing, catching, kicking, striking, and climbing. The specific instructional objectives are written in terms of the terminal behavior, i.e., the mature skill, with accomplishment of the objective based on a quantifiable outcome rather than on the quality of the performance.

Cratty's Program. Although heavily laden with a perceptual orientation, Cratty (1974) provided a multifaceted approach to programming for the child who is mentally retarded. Among other things it attends to some of the fundamental motor skills like walking, running, jumping, hopping, throwing, catching, and striking.

Emphasis is placed on utilizing these skills to promote better classroom and playground performances. Quality of performance is not emphasized. The activities especially as they related to tracking as prerequisite to catching are good.

Cratty's approach is very global with no indication of specific objectives as they related to acquisition of a skill. Rather the objectives are stated broadly, e.g., locomotor agility.

Movement Experiences. Moran and Kalakian (1974) published a text in which they emphasized movement experiences for children who are mentally retarded and emotionally disturbed. The authors devoted
one chapter to fundamental motor skills. The following skills were considered: walking, running, jumping, hopping, skipping, kicking, throwing, and catching.

Even though the movements of the arms, legs, and trunk are considered, the discussion of each skill is directed at the mature form of the skill. An exception is throwing where the authors explicate the various levels of throwing as identified by Wild (1938).

**Voss' Curriculum.** A physical education curriculum for use with individuals 5-20 years of age who are moderately retarded was developed by Voss (1971). The curriculum delineates two categorical groupings, namely, transitional students, i.e., moderately retarded, ages 5-20 and educable mentally retarded students 5 years of age to junior high school level.

The curriculum identifies the following fundamental motor skills: walking, running, jumping, hopping, skipping, climbing, throwing, catching, kicking, and striking. The behavioral objectives are written in terms of the skill's mature level of performance.

The curriculum is designed more for the educable child; it makes periodic reference to the fact that the transitional student has conceptual problems which will probably prohibit mastery of some skills. No provision is made for student assessment in order to access the curriculum at the most appropriate place.

**Curriculum for Young D.D. Children.** Vincent-Smith et al. (1974) developed a gross motor curriculum which has as its goal the development of locomotor efficiency in the young child who is developmentally
delayed. The curriculum examines five major areas of gross motor behavior: supine-prone, semi-erect, walking, climbing and balance, and advanced mobility. Within the last three areas, the curriculum identifies the following fundamental motor skills: walking, stair climbing, running, jumping, hopping, and skipping.

The curriculum has a built-in assessment component called a "baseline probe" which attempts to determine if intervention is needed for a given skill. The "baseline probe" and the subsequent training section for both walking and stair climbing are well defined and appear to approximate an intra-task analysis approach. The same is not true for the remainder of the skills where the authors have either isolated one aspect of the skill, e.g., in jumping where the child is jumping down from a step or concentrated on only the mature aspect of the skill.

**Wisconsin's Guide.** The result, of a six week summer program to give physical educators practical teaching experience with moderately and mildly retarded children at the primary, intermediate, and junior high school levels, was the development of a set of sequential curriculum guidelines complete with behavioral objectives and teaching-learning experiences. Thirty skills in two major categories, basic motor skills and sports skills, were delineated (Guide to Physical Education, 1970).

The curriculum includes the following fundamental motor skills: walking, running, jumping, hopping, skipping, throwing, catching, kicking, striking, and climbing. Behavioral objectives are written
in terms of the mature level of the skill with emphasis on the quantifiable aspect of the behavior, e.g., accuracy in throwing. The quality of the movement is ignored.

**Peabody Developmental Motor Scales.** Concomitant to the Peabody Developmental Motor Scales (Folio & Dubose, 1974) is a program of gross and fine motor activities which are matched to each individual test item. Since the scales are normatively defined ranging from birth to seven years, the following gross motor skills are examined: walking, running, jumping, hopping, skipping, throwing, catching, kicking, stair and ladder climbing.

The prescribed activities purport to assist in accomplishing the normatively defined test item, and therefore they are directed at a quantitative measure of performance as opposed to a qualitative one. With the exception of stair and ladder climbing which are defined in terms of intra-task analysis, the remainder of the activities are designed to produce the quantitative competency measure prescribed for a mature level of the skill, e.g., hop on one foot, three steps.

**Motor Skills Handbook.** Tooper (1971) developed and field tested a motor skills handbook for use with the moderately retarded. Subsequent to the field test procedure, the manual was adopted by the State of Ohio for its (169 Board) county programs of mental retardation.

Twenty-seven activities, the majority of which are classroom related skills, are divided into three mastery levels: beginner, intermediate, and advanced. An evaluation technique classifies the performance into the following levels: minimal, moderate, and acceptable.
In mastery level one, the following gross motor skills are identified: walking, running, jumping, climbing, and kicking. Activities which purport to facilitate performance at an "acceptable" level are suggested. Emphasis is placed on utilizing the skill in its mature form in order to accomplish some quantifiable task.

**Kiddy Key.** Designed as an evaluative and programmatic instrument, the Kiddy Key (Angle, 1972) enables an individual not only to identify delays in gross motor development in infants and young children but also to plan appropriate treatment strategies. Of specific importance to the present study is the Kiddy Key's treatment of walking and its prerequisite components.

Beginning with the skill of kneeling and including half-kneeling to standing, cruising, and finally independent walking, the Kiddy Key provides not only criteria for evaluating the status of a skill but also activities to facilitate acquisition of the skill if it is delayed.

**Ancillary Curricula.** In addition to the ten curricula presented in this section, there are other curricula which deserve to be mentioned, because they have attempted to utilize the fundamental gross motor skills in their programming.

Davis (1968) developed a curriculum in physical education for the mentally retarded which included, among other things, sections on: team sports, recreational activities, and basic skills. The basic skills included walking, running, jumping, hopping, and skipping, but the materials that were presented were merely explanations or definitions of what the mature skill should be.
Other curricula (Braley, Konicki & Leedy, 1968; Systematic Instruction, 1972) emphasized the use of gross motor skills; however, the objective of the curriculum was not always the facilitation or improvement of the skills, rather the use of the skill to attain other objectives, e.g., body image, was stressed.

Finally, many curricula utilize gross motor skills; nevertheless, the utilization is merely one aspect of a total developmental approach to working with young developmentally delayed and retarded children which might include language, cognition, and socialization training as well (Curriculum Guidelines, 1972; Delayed Infant Education, 1974; Developmental Guide, 1975; Educational Program, 1972; Shearer et al., 1972; Wabash Center, 1972).

**Summary**

Ten physical education and motor development curricula designed for use with children who are developmentally delayed and/or mentally retarded were reviewed in this section. Eight out of ten curricula had specific age parameters which included pre-school; the other two were adaptable to the pre-school level. Additionally nine ancillary curricula were reviewed in order that the breadth of available materials might be perused.

As a result of this review, it was possible to classify the curricula into three categories according to their use of an assessment technique: (1) curricula having an assessment which measures performance and prescribes activities based on normative data (Cratty, 1974; Folio & Dubose, 1974; Vincent-Smith et al., 1974); (2) curricula
having an assessment component in the form of behavioral objectives (Angle, 1972; Carr & Avance, 1973; Guide to Physical Education, 1970; Tooper, 1971; Voss, 1971; Wessel, 1975); and (3) curricula having no designated assessment component (Moran & Kalakian, 1974).

CURRICULUM DEVELOPMENT AND BEHAVIORAL OBJECTIVES

In order to accomplish the primary purpose of this study, namely, the development of a model to facilitate an individual approach to programming physical education experiences for the pre-school retarded child, the generation of a performance-based curriculum was essential. Since the curriculum materials were developed within a behavioral framework and since this phase of the study consisted not only of curriculum design but also of curriculum evaluation, the materials presented in this section were invaluable to the entire process of curriculum development.

The term, curriculum, is generally used to describe a plethora of activities, methods, and materials all designed in one form or another to achieve curriculum goals. For the purposes of this study, curriculum is intended as, "a series of materials from which a program is selected individually for each child" (Grobman, 1970, p. 113).

Curriculum Development

The impetus to develop new curricula is conceivably the result of: disenchantment with or deficiencies in existing curricular materials or maybe the lack of any materials at all. Frymier and Hawn (1970) suggest that the real concern, the real reason for the
incalculable number of attempts at curriculum revision and production, is the obvious dissatisfaction on the part of students to go to school to learn. They indicate two primary causes for this feeling of apathy as expressed by contemporary students: curricula which ask the wrong questions and consequently have the wrong objectives and assessment, especially its ineffectual use, in making curriculum type decisions. If any or all of these problems exist and if the challenge to construct a new set of experiences is accepted, the curriculum developer has merely traded an obvious problem for one not nearly so obvious but present nonetheless. This basic problem as defined by Patrick (1972) is: "to determine the effectiveness of instruction, to find out if presenting particular content in a particular way leads to desired outcomes" (p. 21).

In light of Patrick's statement, curriculum design projects should reflect the philosophical basis of the program for which the curriculum is being designed. This includes goal specification which should be readily observable in terms of: curricular content, terminal performance objectives, and prerequisite learner characteristics (Bolvin, 1968; Tyler, 1950). As such curriculum development can be viewed as having two basic components, design and evaluation.

Curriculum Design. There are two dependent stages of design, namely, specification of objectives and ordering of instructional materials. First, the specification of objectives which is especially important when developing a program of individualized instruction provides for: (1) selection of appropriate instructional materials,
(2) measurement by some method of the individual's competencies, (3) establishment of the learning environment, and (4) determination of pedagogical functions and activities (Bolvin, 1968). Further discussion about the specification of objectives will be continued in a subsequent section.

The second phase of curriculum design is the ordering process. Bolvin (1968) indicates that it is an essential characteristic, because it facilitates the orderly arrangement of learning experiences from less complex to more complex. He likewise discusses the process of task analysis and describes its two major functions: ordering objectives, i.e., a hierarchical arrangement and dissecting learning experiences into smaller components to facilitate acquisition of the objective.

According to Tyler (1950), the selection of appropriate learning experiences is based on the following five principles:

1. For a given objective to be attained, a student must have experiences that give him an opportunity to practice the kind of behavior implied by the objective.
2. The learning experiences must be such that the student obtains satisfaction from carrying on the kind of behavior implied by the objectives.
3. That the reactions desired in the experience are within the range of possibility for the students involved.
4. That there are many particular experiences that can be used to attain the same educational objectives.
5. That the same learning experience will usually bring about several outcomes. (p. 42-43).

Curriculum Evaluation. During and after the development of a new curriculum package, it is necessary to determine if, in fact, the new approach is more viable than its predecessor. This process is
known as evaluation. There are primarily two stages in the evaluation of a curriculum: (1) an examination of all curricular components to decide if they are consistent with its general aim and (2) a determination of the impact of the new program on learning (Tyler, 1969).

Tyler (1950) made a concise statement of the purpose of evaluation when he said,

It should be clear that evaluation ... (is) a process for finding out how far the learning experiences as developed and organized are actually producing the desired results... (p. 68).

Grobman (1970) reaffirmed Tyler's previous contention and suggested additionally that the whole purpose of evaluation especially in the "embryonic stages" was to identify strengths and weaknesses, to restructure the materials based on available feedback, and finally to retest the new product.

Behavioral Objectives

In 1962, Robert Mager wrote a book which has not only revolutionized teaching but also engendered one of the most contestable educational controversies in recent history. In Preparing Instructional Objectives, Mager sets forth the instructional objective as one which: defines the behavior expected, describes the environmental set in which the behavior is to occur, and includes a performance criterion. Being more concise, Mager says, "... the most important characteristic of a useful objective is that it identifies the kind of performance that will be accepted as evidence that the learner has achieved the objective" (p. 13).
The controversy alluded to above revolves around the argument of delineating objectives into specific, observable, measurable behaviors. For the most part proponents of the use of behavioral objectives reiterate Mager's definition. Only minor idiosyncratic interpretations produce additional points of interest. Vargus (1972) emphasizes the use of behavioral objectives to communicate to the learner what is expected as well as to assist the instructor in his selection of appropriate learning experiences. She also makes a clear distinction between behavioral objectives and activities, i.e., learning experiences. Learning experiences are a means to an end, namely, the behavioral objective, while the behavioral objectives are ends in themselves.

Clark (1972) emphasizes that the learner is the prime mover in the learning process not the teacher. He likewise suggests that the objective is the result of a program of learning experiences and not engendered by its own being.

Engman (1968) concludes that the primary benefit of using behavioral objectives is consistency. Consistency in this context means that the choice of learning experiences must be in line with the stated objective; additionally, it means that evaluation of student performance must be consistent with both the learning experiences and the objectives. He also contends that teacher effectiveness is enhanced by using behavioral objectives; failure to realize objectives can be traced to one or more of the following curricular misjudgements: (1) objectives which are developmentally inappropriate, (2) misdirected learning experiences, and (3) poorly validated testing instruments.
Opponents of the behavioral objective movement include among their number, Ralph Tyler, the Father of Behavioral Objectives. Tyler in an interview for the Kappan (Fishbein, 1973) tried to clarify some of the major "hang-ups" in the behavioral objective movement. He concludes that the movement has extremist qualities which support the idea that learning is limited to the acquisition of specific behaviors or patterns of behavior. This, he contends, excludes the development of learning by generalization. Tyler is quoted as saying, "An educational objective does not need to be specific in order to be clear, attainable, and capable of assessment" (p. 57).

Myron Atkin (1968) articulated four "reservations" about behavioral objectives. First, he argues that many worthwhile objectives are pursued in the educational setting even if educators cannot explicate them. A second argument has to do with the inability of some exciting and interesting projects and innovations from ever getting started because of an insistence on structuring behavioral objectives. The third prohibition is the loss of the "teachable moment." The final reservation is that those constructs which are stated in behavioral terms, i.e., observable, measurable performance criterion, are the only important elements.

Eisner (1967) believes the use of behavioral objectives can hinder the intent of instruction as easily as they purport to help it. He explicates what he considers to be three limitations of behavioral objectives: (1) the outcomes of a total educational program are too numerous to objectify, (2) the constraints placed on explaining in behavioral objective form limit the outcomes of certain subject matter
areas, e.g., "creativity" in art, and (3) the assumption that behavioral objectives assist in measuring achievement when, "Not all - perhaps not even most - outcomes of curriculum and instruction are amenable to measurement" (p. 255).

**Curriculum Development Utilizing Behavioral Objectives**

A predictive model of curriculum development purports to establish specific objectives and to delineate learning experiences which will assist the child in attaining the objective. Behavioral objectives are the basis of such a model.

Whenever a predictive model of curriculum development is employed, there are some basic questions and concerns which need to be considered. The selection of behavioral objectives is not a random process; it should include some definite priorities conceivably based on a needs assessment. A systematic selection of objectives should include as many of the following as possible: (1) the selection of content based on what abilities the student should possess, (2) an arbitrary delineation of content into high and low order levels of mastery with estimates of the percentage of students who should be lead to the higher objectives, (3) a determination of the number of students who can achieve mastery levels based on pretest measures, and (4) the selection of objectives based on an analysis of current status with desired status (Baker & Popham, 1973).

When confronted with the problem of selecting behavioral objectives for a population of retarded children, Chalfont and Silikovitz (1970) delineated eight basic criteria: prior knowledge, prerequisite
skills, relevance, physical proximity, frequency of encounters, concreteness, appeal, and appropriateness. Foremost among this list are: prior knowledge which emphasizes the acquisition of skills not yet in the child's repertoire; prerequisite skills which attends to the matter of whether the child has an existing skill repertoire sufficient to handle new material; physical proximity which emphasizes teaching activities common to the child's environment, and frequency of encounter which stresses instruction in those activities which the child is called on to use most frequently in his environment.

The process of utilizing behavioral objectives as evaluative criteria is indicative of movement through a closed but dynamic system. Initially, the process begins by defining the behavioral objectives and by determining which learning experiences will facilitate attainment of the objective. Implementation of the behavioral objectives, i.e., the curriculum, is next; this requires some estimate of the abilities and capabilities of the learner as well as selection of appropriate instructional methodology. Evaluation is the next phase; assessment determines if the objectives were met based upon the methodological procedures used during implementation. The last phase, revision, determines what the subsequent objective(s) will be based on successful completion of the previous objective.

Engman (1968) has described such a model which portrays movement through a closed but dynamic system. The following is a diagramatic sketch of the model:
PHASE I

Objectives stated in behavioral terms

PHASE II

Appropriate learning experiences based on stated objectives

PHASE III

Evaluation of Objectives

PHASE IV

Analysis and Revision

CONSISTENCY

In support of behavioral objectives as a logical means of curriculum evaluation, Welbesser (1963) said,

... the most significant benefit of curriculum objectives presented as statements of reliably observable behaviors is that it instructs one in precisely what to observe the child doing or saying provided that materials have been effective (p. 297).

Direct measurement of observable events is the basis for a behavioral objective approach. This requires a description of what will be considered a "minimally acceptable performance."

If the criterion for an acceptable performance is not attained, i.e., the objective is not accomplished, then there are three alternatives. First, the objective may need to be changed, and secondly, the learning experiences may need to be changed. Finally, the curriculum may need to be revised (Eisner, 1969).
Curriculum Evaluation

In general, evaluation is the process of determining how well the educational objectives are being realized as a result of the curriculum (Tyler, 1950). It is important, however, to keep in mind that evaluation is not the fundamental purpose of the curriculum project, rather it functions merely as one aspect of the entire process. Grobman (1968) made this distinction very clear when she said, "... the evaluation must fit into the project, not the project into the evaluation" (p. 11).

Formative Evaluation. The roles of evaluation as described by Scriven (1967) consist of two distinct processes which in practice can and often do overlap. The first role is one of formative evaluation, i.e., evaluation which takes place early in the curriculum's development. Grobman (1970) reiterates a similar function of formative evaluation; she contends that the developmental process or period is a time for building, checking for inconsistencies, rebuilding, and ultimately implementing the revised product. Her primary thrust during formative evaluation is the improvement of materials.

Formative evaluation consists of two parts, content analysis and classroom tryouts (Grobman, 1970). Content analysis simply means a review of the curriculum materials by persons both in and out of the primary field.

Classroom tryouts consist of implementing the curriculum on either a pilot basis or a large scale basis. There are usually no restraints placed on the curriculum developer relative to who can
implement the curriculum. Customarily project staff members as well as specialists in a given area have attempted to evaluate materials. Untrained persons and/or volunteers are not precluded from the process (Grobman, 1970).

**Summative Evaluation.** Summative evaluation is the terminal process in the entire evaluation scheme. It is intended to generate some definitive conclusion about the finished product (Scriven, 1967).

Two purposes are served by the summative evaluation, namely, a description of the finished product and an indication of how closely the project came to achieving its a priori goals (Grobman, 1970). The first component, a description of the finished product, is also called product evaluation. As with formative evaluation, this phase of summative evaluation is directly concerned with the curriculum materials not from the standpoint of developing them but from the standpoint of producing the desired change as purported by the curriculum developer.

Product evaluation asks very general questions like, Can the population use the materials? This is called macro-evaluation. It can also make very specific inquiries like, Is the material in section A progressive. This is referred to as micro-evaluation (Grobman, 1968). It is obvious therefore that some of the evaluation activities performed in the summative period, especially the micro-evaluation stage will serve a formative evaluation purpose (Grobman, 1970; Scriven, 1970).

Process evaluation, the second component of summative evaluation, is concerned with the methods and procedures utilized in developing,
implementing and disseminating the curriculum materials. If the same curriculum developer or anyone else would ever want to replicate the curriculum project, then the process evaluation would be of assistance by helping them eliminate weaknesses in the previous project while utilizing its strong points (Grobman, 1970).

This becomes especially critical when one is attempting to promote the end product. Blum and Leonard (1963) contend,

The key to its (end product) adoption and usefulness elsewhere may not be do so much in the proof of effectiveness as in knowledge of the steps that resulted in its development and secured participation and acceptance (p. 318).

SUMMARY OF RELATED LITERATURE

This chapter was divided into three topical sections. The first section analyzed the current evaluative methodology especially as it relates to physical education and motor development. Numerous assessment and screening instruments were reviewed with emphasis on their motor components.

In the second section, an attempt was made to dissect the eleven skills selected for inclusion in the proposed assessment instrument and curriculum. The skills were examined from an ontogenetic perspective.

Curricula which are currently available to professionals interested in programming motor experiences for the retarded child were presented in section three. Emphasis was on the pre-school level.

Finally, there was a cursory review of the topic of curriculum development. Curriculum design and evaluation served to anchor this discussion. Additionally, arguments for and against the use of
behavioral objectives were discussed; the use of behavioral objectives in curriculum development was highlighted. The chapter concluded with a discussion of evaluation as it relates to the curriculum per se. Two types of evaluation were mentioned: product and process.
CHAPTER III

METHODS AND PROCEDURES

This chapter describes the methods and procedures utilized in developing an instructional model to facilitate an individual approach to programming physical education experiences for the pre-school child who is moderately retarded. It also describes the methods and procedures used in developing an instrument, based on intra-task analysis, to assess fundamental gross motor skills and in generating curriculum materials contiguous to the assessment instrument. In organizing the methods and procedures, the chapter has been divided into three primary sections: (1) The O.S.U. PIPE concept and its relationship to O.S.U. SIGMA and O.S.U. PBC, (2) O.S.U. Scale of Intra-Gross Motor Assessment, and (3) O.S.U. Performance-Based Curriculum.

RELATIONSHIP OF O.S.U. PIPE TO O.S.U. SIGMA AND O.S.U. PBC

In order to achieve the primary purpose of this study, a model (Ersing, 1972) was designed to facilitate an individual approach to programming physical education experiences for the moderately retarded pre-school child. The model was entitled The Ohio State University Programs for Individuals in Physical Education (henceforth referred to as O.S.U. PIPE) and consisted of three essential modular components: assessment, planning, and implementation. The combined interaction of these three components constitutes the working model which is portrayed diagrammatically in Figure 1.

The model is entered via the assessment component, The Ohio State University Scale of Intra-Gross Motor Assessment. The instrument
Figure 1. P.I.P.E. MODEL (Programs for Individuals in Physical Education)
assesses a level of performance for a given skill, i.e., one of four possible levels ranging from a very immature level to a mature functional level.

The last two components, planning and implementation, of the model are merely variations of the same generic component and are entitled The Ohio State University Performance-Based Curriculum. The performance-based curriculum is also arranged according to levels with objectives and teaching-learning experiences to facilitate motor skill development for each. The curriculum has as its terminal objective the performance of a given skill at its most mature level.

In effect, the O.S.U. SIGMA provides the kind of evaluative information which is necessary to access the companion curriculum, the O.S.U. PBC. Assessment determines the curricular level in which the child will be functioning. However, additional inputs and observations could dictate further adjustments in the selection of curricular levels and experiences. After the curricular level is determined, it is implemented until the performance objective is achieved or until circumstances indicate a need for reassessment.

The three basic components of the model interact by means of the mechanism designated as the "continuous assessment process." This is an ongoing process which at any time may provide the essential information necessary to restructure the child's program so as to be more in line with his needs.

It cannot be stressed emphatically enough that the curriculum does not teach to the first three levels of O.S.U. SIGMA which are
immature levels of a skill. Rather it teaches to its own levels and objectives which are approximations of and lead-ups to the level four behaviors as described in O.S.U. SIGMA.

THE O.S.U. SCALE OF INTRA-GROSS MOTOR ASSESSMENT

The O.S.U. SIGMA was the result of a rather lengthy procedure which is herein explicated. The Scale and its resultant design were a product of reviewing and integrating the literature in the field of motor development. The delineation of four levels was an arbitrary decision which can be attributed to the natural four level arrangement of those skills that were initially analyzed, i.e., throwing and catching. Consequently the remaining skills were analyzed in terms of describing four discrete, observable levels of motor behavior. The supportive literature which substantiates the levels that have been delineated can be found in chapter two, section two.

Certain levels, e.g., level one of throwing, as well as components of other levels were included because of strong empirical suppositions that they were critical factors in performance. This in no way detracted from the basic substance of a particular level since every level was either specifically referenced or the empirical insertion was so basic that to argue against its inclusion would have been contrary to the concept of sequencial development.

Formative Evaluation of O.S.U. SIGMA

The process of evaluating O.S.U. SIGMA was instituted almost with the inception of the concept. This researcher and his advisor spent many hours developing, assessing, and revising a model for each
level of each skill. After the obvious flaws and shortcomings were revised, the first draft of the instrument was ready for dissemination.

**Sample.** The first draft of O.S.U. SIGMA was sent to thirteen professional educators and teachers of developmentally delayed children. Of the thirteen evaluators, ten were physical educators. Additionally, a certified physical therapist, a teacher of pre-school, developmentally delayed children, and a coordinator of a Developmentally Delayed Infant Education Outreach Project reviewed the instrument. These individuals were selected either because of their expertise in the study of motor development, because of their knowledge of young, developmentally delayed children, or because of their association with physical education especially as it relates to the mentally retarded.

**Method of Gathering Data.** A package of materials consisting of a copy of O.S.U. SIGMA, a cover letter explaining the purpose of the study, and a copy of four specific questions to be used in evaluating the instrument (See Appendix A) was sent to each evaluator. A stamped, self-addressed envelop for returning the evaluation materials was included in each package for the convenience of the evaluator.

**Analysis of Data.** The responses to the specific evaluative questions as well as additional comments which were encouraged served as the basis for the second draft of O.S.U. SIGMA. The responses were categorized according to: (1) consensus opinion, i.e., a group identified a specific part or parts in need of change, (2) unitary
opinion, i.e., maybe only a single person identified an area which after reviewing it again was in need of modification, and (3) non-consensus opinion, i.e., responses which were not categorically significant.

**Video Taping of O.S.U. SIGMA**

In preparation for a subsequent phase of this study, it was necessary to record the performances of 12 subjects during a total administration of the O.S.U. SIGMA. For this purpose each subject was video taped.

**Subjects.** The revised O.S.U. SIGMA was administered to twelve children, ages 2 years, 5 months to 14 years, 1 month. The age, sex, and categorical status, i.e., normal or developmentally delayed, of each subject is presented in Table 1. The subjects were chosen primarily, because they were easily accessible. This researcher knew the subjects on either a personal basis or as a result of professional contacts.

**Method of Gathering Data.** All subjects were individually assessed with the entire O.S.U. SIGMA and simultaneously video taped. The taping was done in a gymnasium approximately 70 feet long and 45 feet wide which was housed in the Misonger Center for Developmental Disabilities on the campus of The Ohio State University.

A Sony Portable Video-Taping System including a videocorder #34330, a portable videocorder AV-3400, and AC power adaptor AC 3400 was used in making the tapes. All taping was done on one-half inch Scotch Brand video tape.
### TABLE 1

Characteristics of the Subjects Assessed With O.S.U. SIGMA

<table>
<thead>
<tr>
<th>Children</th>
<th>Sex</th>
<th>CA Yr.</th>
<th>CA Mo.</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>N&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>2</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>3</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>3</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>4</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>4</td>
<td>5</td>
<td>DD&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>5</td>
<td>0</td>
<td>DD</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>5</td>
<td>1</td>
<td>DD</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>5</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>6</td>
<td>10</td>
<td>N</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>9</td>
<td>11</td>
<td>DD</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>14</td>
<td>1</td>
<td>DD</td>
</tr>
</tbody>
</table>

<sup>a</sup> Normal  
<sup>b</sup> Developmentally Delayed
The equipment was set up in the middle of the gymnasium on what would be the intersection of the sideline and midcourt line on the basketball court. For the most part, taping was done at a distance of approximately 15 to 20 feet. Walking, running, and skipping were performed over a distance of approximately 25 feet which was perpendicular to the camera's line of sight. Two trials of running were performed by standing directly in front of the camera and moving forward away from the camera in a straight line. All of the other skills with the exception of ladder climbing and stair climbing were performed in a quasi-stationary location. The two climbing activities required a relocation of the equipment.

With the exception of the first subject who was taped, the skills which make up O.S.U. SIGMA were administered in the following order: walking, running, hopping, throwing, catching, jumping, kicking, striking, skipping, ladder climbing, and stair climbing. The request to perform each skill was initially transmitted verbally. If, however, the child did not understand the request or if his first attempt conveyed misunderstanding, the skill was then demonstrated. The children had three trials at each skill.

The directions given to the children prior to performing the skills were as follows:

Walking - "Can you walk to me?"
Running - "Can you run to me?"
Hopping - "Can you hop on one foot two times?"
Throwing - "Can you throw the ball to me real hard?"
Catching - "Can you catch the ball?"
Jumping - "Can you jump across the paper?" Note: Examiner slapped the floor on the side of the paper where the child was to land.

Kicking - "Can you kick the ball to me?"

Striking - "Can you hit the ball?" If striking was attempted with one hand, the examiner then said, "Can you swing with two hands on the bat?"

Skipping - "Can you skip to me?"

Ladder Climbing - "Can you climb up the ladder?" "Can you climb down?"

Stair Climbing - "Can you walk up the stairs?" "Can you walk down the stairs?" If the child attempted to hold onto the railing, he was encouraged to perform the task independently.

Test-Retest Reliability Study

A test-retest reliability study was conducted on O.S.U. SIGMA using the video taped performances of the twelve subjects as the repeated measure.

Sample. Thirteen individuals participated as judges in the study. All were associated with the Adapted Physical Education Training Project at The Ohio State University; they were either master's trainees directly involved in the project or master's and doctoral students with a major program emphasis in adapted physical education. Invitations were extended to other individuals who had expressed an interest in the study, but because of the strenuous temporal demands imposed by the study, they were, on a whole, unable to participate.

Method of Gathering Data. One week prior to the start of the study, a copy of O.S.U. SIGMA was given to each judge to review. On the Friday preceding the start of the study, a one hour briefing
was held for the judges to clarify any misconceptions or problems resulting from their review of the instrument. Anyone unable to attend that meeting was seen by the researcher at some other time that day or in one case the next day.

The judges were divided into two groups with seven judges in one group and six judges in the other. This was necessary because of schedule conflicts. One group met on Monday evenings, and the other group met on Tuesday. Prior to starting the study on each of the first two evenings, the judges were again given an opportunity to clarify any misunderstandings.

The test-retest schedule consisted of viewing the tapes and of making a determination about the level in which the child was functioning. The viewing process took place in a small conference room in the Nisonger Center for Developmental Disabilities. The tapes were replayed on a Sony Videocorder AV-8600; they were transmitted on a 23" RCA Instructional Television Receiver/Monitor (JR-968W).

The judges observed each child performing each skill three times. At the end of the third trial for each skill, the tape was stopped and the judges were given time to record their observation on the score sheet (See Appendix B). If a judge wanted to see the performance again, the tape was rewound and replayed a second time. Because of time constraints, only one playback per skill was permitted.

One week later, the retest portion of the reliability study was undertaken. The same procedure was followed. Each night approximately two-thirds of the way through the viewing, the judges were permitted to break for 20-30 minutes and enjoy some refreshments.
Analysis of Data. The data from the test-retest reliability study were analyzed using a nonparametric statistic, Scott's Pi. The use of Scott's Pi was predicated on the assumption that the data emanating from this study were nominal. This assumption precludes the use of more conventional methods of analyzing inter- and intra-recorder reliability, e.g., Pearson product-moment correlations, since these methods require data which are interval.

The formula for Scott's Pi is:

\[
\pi = \frac{P_o - P_e}{1 - P_e}
\]

where \(P_o\) is the percentage of agreement between judges on independent observations, and \(P_e\) is the expected agreement based on chance (Scott, 1955).

O.S.U. PERFORMANCE-BASED CURRICULUM

Subsequent to the development of the O.S.U. SIGMA, the second independent thrust of the study was undertaken. It consisted of the production of O.S.U. PBC which is a curricular package complete with performance-based objectives and teaching-learning experiences.

Formative Evaluation of O.S.U. PBC

The generation of O.S.U. PBC and its subsequent evaluation was conducted in the following manner: (1) objectives were established for each level of each skill based on its relevance and its capacity to bring about behavioral change in a positive direction, i.e., in the direction of a mature functional skill, (2) each set of objectives was reviewed and revised accordingly, (3) once the behavioral objectives
were solidified, the teaching-learning experiences were developed, and (b) each set of teaching-learning experiences was reviewed and revised in light of the established objective. The formative evaluation process conducted cooperatively by this researcher and his major advisor.

**Summative Evaluation of O.S.U. PBC**

After development of the curriculum materials and the concomitant formative evaluation, the first draft of O.S.U. PBC was disseminated. This study included a summative evaluation which consisted of either a practical implementation of the materials only, a theoretical review of the materials only, or a combination of the two.

**Sample.** The first draft of O.S.U. PBC was sent to twenty-four professional educators and teachers of developmentally delayed children. Twenty-two were physical educators either teaching at the college level or teaching developmentally delayed children in public agencies or public school systems. The two remaining evaluators were a pre-school teacher of developmentally delayed children and a member of this researcher's reading committee from the faculty of early and middle childhood education at The Ohio State University. These individuals were selected either because of their expertise in the study of motor development, because of their knowledge of young, developmentally delayed children, or because of their association with physical education especially as it relates to the mentally retarded.
Method of Gathering Data. The study was designed to collect evaluative information on the curricular materials. This was accomplished by staggering the mailing of the curricular components over a six week period. After the initial mailing, two additional mailings were sent at three week intervals.

The first package of materials was mailed on April 1, 1975. It contained: a cover letter explaining the purpose of the study, the first four skills of the curriculum, a copy of O.S.U. SIGMA related to those specific skills, a copy of a Materials Evaluation Form for each skill - summative evaluation device, and an addendum sheet pertaining to the use and classification of teacher assistance in the curriculum (See Appendix C). A stamped, self-addressed envelope for returning the evaluation materials was included for the convenience of the evaluator.

On April 18, 1975, the second set of curriculum materials was mailed; this concurred with the date of the requested return of the first set of materials. In this mailing there was: a cover letter introducing the second set of materials, the next three skills of the curriculum, a copy of O.S.U. SIGMA related to those skills specifically, a copy of Materials Evaluation Form for each skill, and an addendum sheet (See Appendix D). The stamped, self-addressed envelope was again enclosed.

The final set of materials was mailed on May 12, 1975; this concurred with the date of the requested return of the second set. This mailing included: a cover letter, the final four skills of the curriculum, a copy of O.S.U. SIGMA related to those specific skills,
a copy of a Materials Evaluation Form for each skill, and an addendum sheet (See Appendix E). Enclosed was a stamped, self-addressed envelop. This final set of materials was to be returned on or before June 2, 1975.

**Analysis of Data.** The data gleaned from the Materials Evaluation Forms were arranged by skill; frequency distributions were computed for each question. Written comments on the Materials Evaluation Forms as well as on the curriculum materials were compiled according to skill. As a result of the analysis of the Materials Evaluation Forms, revisions were made in the curriculum materials.
CHAPTER IV
ANALYSIS OF DATA

This chapter purports to analyze, interpret, and discuss the findings of the study. The chapter is divided into three main sections: the evaluation of O.S.U. SIGMA, the test-retest reliability study on O.S.U. SIGMA, and the O.S.U. PBC materials evaluation.

EVALUATION OF O.S.U. SIGMA

Analysis of O.S.U. SIGMA Evaluation

Copies of the first draft of O.S.U. SIGMA were sent to 13 evaluators; 11 (or 84.6%) evaluations were returned. The analysis which follows was gleaned from the responses of those eleven evaluators.

The evaluation which was an open-ended survey approach provided four basic questions for consideration by the evaluators. Other than being cognizant of the kinds of constructive criticism that was encouraged, the evaluators were free to approach their task in any manner.

The tables (2 through 12) which follow represent the data collected during this phase of the study. The responses to each skill in the O.S.U. SIGMA will be discussed in light of the data collected and presented in tabular form.

Walking. Six evaluators responded to the materials on walking. Four respondents indicated an exigence to define exactly what was occurring when the term "assistance" was used in the first three levels; this included a request to describe more definitively the method of assistance that the examiner could supply. Two respondents
expressed the need to specify the number of trials permitted at each level. Table 2 provides a complete list of evaluative concerns by levels for walking.

Running. The results of the evaluative responses for running which were completed by seven respondents are presented in Table 3. The use of the phrase, "rapid pace," was criticized by two respondents; the suggestion was made by one of them to use the term, "increased." One response indicated some confusion over the use of the phrase, "no total suspension." Additionally, one evaluator expressed a need to specify the number of trials permitted at each level.

Hopping. In Table 4 a complete list of evaluative concerns as registered by four respondents for the skill of hopping is presented. It was suggested that the best results are obtained when the hopping action is performed while traversing a distance and not while in a stationary position. One evaluator suggested that the number of expected hops (consecutive) be specified in levels two, three, and four. One respondent wanted to know if hopping on both feet was considered important.

Throwing. Six evaluators provided feedback on the throwing materials. Three persons expressed a desire to specify the number and proportion of throws necessary to demonstrate minimal competence at each level. One respondent suggested that movement of the feet at all levels be de-emphasized and that trunk rotation be considered the top priority. In each level the direction of the ball's path
TABLE 2
Evaluative Responses for O.S.U. SIGMA by Levels for Walking

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=6)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Will assistance be defined in training section?</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>When child stands with assistance, teacher behavior is what is described and behavioral objectives are for the child. State separately - for the purpose of testing this level child may be placed in standing position also.</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Do not want to stipulate holding or leaning against object being cruised along.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Criteria might be easier to observe if it were translated to a number of child steps.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>How necessary is it that child starts from sitting position?</td>
<td>1</td>
</tr>
</tbody>
</table>

General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.

Verification requested on the number of trials permitted at each level. | 2

Is the wall, bench, rail, etc. "stationary"? | 1

I don't understand why standing either independently or with assistance is included at all 3 levels - the individual standing unassisted would seem to be at a higher level, also why the large jump from level III to level IV? | 1
### TABLE 3

**Evaluative Responses for OSU. SIGMA by Levels for Running**

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=7)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>There is, I believe, a level between these two - we have kids who run (?) but legs and arms are stiff. They have accomplished level I but are so very far from level II - no bent arms, no opposition.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Clarification requested on phrase &quot;rapid pace.&quot; Suggestion made to substitute &quot;increased.&quot;</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Characterized by knee retraction, i.e., quick up and down motion of the knees.</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Regarding &quot;no total suspension,&quot; Does this mean but never leave ground together? - State it that way - unclear to me.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>A distance and/or time criterion is needed.</td>
<td>1</td>
</tr>
</tbody>
</table>

**General Responses** -- These are comments relative to either all levels, to test conditions, or to equipment.

| Verification requested on the number of trials permitted at each level. | 1 |
TABLE 4
Evaluative Responses for O.S.U. SIGMA
by Levels for Hopping

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=4)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Isn't this a description of a jump rather than a hop?</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Child cannot hold foot up with arm at side and hand grasping foot off the floor can he?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hopping at this level is primarily a flexor pattern.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>How many times in succession does child hop on each trial?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>On just one foot - or must he be able to hop on either foot?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Timing of the hop is important at this level.</td>
<td>1</td>
</tr>
</tbody>
</table>

General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.

Hopping is better executed while traversing a space and not in a stationary position. | 1         |
was considered to be too general by one evaluator. Table 5 contains the complete list of responses by levels for throwing.

**Catching.** The results of the evaluative responses for catching which were completed by four respondents are presented in Table 6. A question was raised by one respondent about the type of throw to be used in level one, i.e., overhand or underhand. One evaluator was concerned about the lack of a description of the ball's flight path, i.e., straight of arc, in level two. This same evaluator questioned the continued use of a large playground ball instead of a tennis ball in level four.

**Jumping.** In Table 7 a complete list of evaluative concerns as registered by six respondents for the skill of jumping is presented. Two persons expressed a need to specify the number of trials permitted at each level, while two evaluators were concerned that the piece of paper to be jumped over was not secure to the floor, e.g., with tape. The distance to be jumped especially as it relates to the fourth level was considered too short by two respondents.

**Kicking.** Five evaluators responded to the materials on kicking. Again two respondents expressed a need to specify the number of trials permitted at each level. The direction of the kick as well as the distance the ball traveled were criticized by one respondent as being too general. Additionally, one evaluator suggested that the child should "run" at the ball in levels three and four, while another was uncertain as to whether or not the child was walking at all espe-
<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Why a 6 inch ball?</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Clarification requested on arm swing as either downward or flat.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>Regarding homolateral stepping, this may be an observed behavior but it would seem to me to be a debatable point whether to train it if it doesn't exist, before one would go on to contralateral stepping.</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>Direction of throw is too general</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A distance criterion is needed</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>General Responses</strong> -- These are comments relative to either all levels, to test conditions, or to equipment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verification requested on the number of trials permitted at each level.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>De-emphasize the movement of the feet at each level.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Trunk rotation is the primary concern.</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE 6
Evaluative Responses for O.S.U. SIGMA
by Levels for Catching

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=4)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Is the ball thrown to the child in an underhand or overhand manner?</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Is the ball thrown to the child in a straight line or in an arc?</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>&quot;Jaws of a vice&quot; - What's that! Is it like snapping hands together?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Would a playground ball be best for this or something stronger that wouldn't give?</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>Why aren't you using a tennis ball here?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Suggest you use #1 and #2 under &quot;b.&quot; to continue outline format in order to make this step read easier.</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE 7
Evaluative Responses for O.S.U. SIGMA
by Levels for Jumping

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=6)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>It would seem that the child who can only accomplish (a) in level I would not be ready for level II as would one who accomplishes (b) or (c). From (a) I would go to a knee flexion and extension to tip-toe then to jump down from step (b), then to level II. Clarification requested on the extent of teacher assistance, i.e., holding child's hand. Differentiate leap and jump as requiring one foot take off and two foot take off respectively.</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Clarification requested on &quot;two foot hop.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>Clarification requested on landing with feet &quot;straddled.&quot; Regarding the arm motion, eliminate arms swinging forward.</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>Can the hands touch the floor on landing? Jumping distance does not seem far enough. Suggest using a distance of approximately 2k&quot;. Timing of the jump is important at this level.</td>
<td>1</td>
</tr>
<tr>
<td>Levels</td>
<td>Responses ( (N=6) )</td>
<td>Frequency</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.</td>
<td>Verification requested on the number of trials permitted at each level.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Regarding the test condition, is the paper secure to floor, e.g., with tape?</td>
<td>2</td>
</tr>
</tbody>
</table>
cially in levels two, three, and four. The complete list of responses by levels for kicking is contained in Table 8.

**Striking.** The results of the evaluative responses for striking which were completed by five respondents are presented in Table 9. Two respondents were confused and expressed concern about the phrase "tether ball effect" in the description of the test equipment. In level one, two evaluators were critical of using a bat; one suggested using a paddle, while the other was in favor of striking with the arm.

**Skipping.** In Table 10 a complete list of evaluative concerns as registered by five respondents for the skill of skipping is presented. Three respondents expressed a need to specify the number of trials permitted at each level. One person suggested that in level one the terms, galloping, hopping, and leaping, be defined.

**Ladder Climbing.** Only four evaluators responded to the materials on ladder climbing. Again three respondents expressed a need to specify the number of trials permitted at each level. The responses pertaining to the skill of ladder climbing are contained in Table 11, page 88.

**Stair Climbing.** The results of the evaluative responses for stair climbing which were completed by five respondents are presented in Table 12, page 89. Once more three respondents wanted clarification on the number of trials permitted at each level. In level one, a definition of creeping up the steps was suggested by one evaluator.
TABLE 8
Evaluative Responses for O.S.U. SIGMA
by Levels for Kicking

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Write out the word feet; people may see inches because they haven't looked.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Is it necessary to have the child walk up to the ball?</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Leg push must be avoided.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>Have child run at the ball.</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>Have child run at the ball.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Direction of kick is too general.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>A distance criterion is needed.</td>
<td>1</td>
</tr>
</tbody>
</table>

General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.

Verification requested on the number of trials permitted at each level. 2

Are all kicking tasks done while walking - Level 3 distance increases and yet it is not stated whether child is walking -- also levels 2 and 4. 1
### TABLE 9
Evaluative Responses for O.S.U. SIGMA by Levels for Striking

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=5)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Is it necessary to use a bat at this level? Suggest striking with arm.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>What if the child's feet remain stationary?</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>How come you didn't use a paddle?</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Clarification requested on swing, i.e., &quot;flat (horizontal) or slightly downward.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>Clarification requested on swing, i.e., &quot;flat (horizontal) or slightly upward.&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

**General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.**

- Regarding test equipment, there was confusion about the "approximate" size of the bat. 1
- Clarification and explanation of "tether ball effect" requested. 2
TABLE 10

Evaluative Responses for O.S.U. SIGMA by Levels for Skipping

<table>
<thead>
<tr>
<th>Levels (N=5)</th>
<th>Responses</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A definition of running, galloping, hopping, and leaping is needed.</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Arms are held in a high guard position.</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>A distance criterion is needed.</td>
<td>1</td>
</tr>
</tbody>
</table>

General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.

Verification requested on the number of trials permitted at each level. | 3         |
### TABLE 11

**Evaluative Responses for O.S.U. SIGMA by Levels for Ladder Climbing**

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verification requested on the number of trials permitted at each level.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Clarification requested on the angulation of ladder against wall, i.e., degree of slant.</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE 12
Evaluative Responses for O.S.U. SIGMA by Levels for Stair Climbing

<table>
<thead>
<tr>
<th>Levels</th>
<th>Responses (N=5)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Define &quot;creeping up the stairs&quot; behavior.</td>
<td>1</td>
</tr>
<tr>
<td>II</td>
<td>Clarification requested on &quot;two foot landing.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>Clarification requested on &quot;alternate stepping pattern.&quot;</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

General Responses -- These are comments relative to either all levels, to test conditions, or to equipment.

Verification requested on the number of trials permitted at each level. | 3         |
Summary

Copies of the first draft of O.S.U. SIGMA were reviewed by eleven evaluators. The evaluative information procured through this process was analyzed and categorized according to its relevance to each level, to every level, to the test condition, and to the test equipment. The data were then subjectively reviewed by this investigator and his major advisor for the purpose of revising the first draft of O.S.U. SIGMA in preparation for the reliability study of the assessment tool.

Interpretation of O.S.U. SIGMA Evaluation

After analyzing the evaluative responses of the first draft of O.S.U. SIGMA, the results were used to revise the instrument. The subsequent discussion will highlight those salient remarks and observations which, in the opinion of this investigator, warranted their inclusion in the revised instrument. It should likewise be understood that changes have been made by this investigator and his major advisor when such changes were expedient or when feedback from individuals who had an opportunity to use the instrument justified a change.

Walking. In terms of the concern for a more definitive explanation of the nature and use of the test equipment, two additions were made, namely, stating that the equipment was to be in a stationary position and indicating that the examiner was not to be used as a supportive device.

Pertaining to the assumption of an upright standing position and to the concern for initiating the movement from a sitting position,
an additional review of the literature seemed to indicate that, developmentally, pulling to a stand from an all 4's position was more appropriate. Accordingly the change was made in the test condition at each level.

Since the primary behavior at level one is maintenance of an erect standing posture, the secondary behavior, assumption of the standing position, was placed in the test condition. In level three, a description of the predominate walking behavior was included, and the frequency of seeking support was made more definitive for measurement purposes. The reason for permitting only one touch at level three was to make the distance between levels three and four more realistic developmentally; this was an evaluative concern.

Running. In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

In level one there was a question on the use of the term, rapid. It was suggested that the descriptor, increased, be substituted. Subsequently, this latter term was added to the description of the behavior at this level. Additionally, it was suggested that at level one the movement of the knees, i.e., quick up and down movements, be emphasized. This too was included at level one.

At level two the broad base of support was described because it was thought to be a distinguishable and an observable characteristic. For this same reason, the existence or lack of existence of a period of total non-support was eliminated from the criteria at levels two and three and reserved exclusively for level four.
**Hopping.** Hopping as described in levels three and four, i.e., in a stationary position, was too difficult to observe. It was therefore determined that hopping should be performed while the child is traversing a horizontal distance.

It was suggested that a minimal number of consecutive hops be included as part of the criterion measure for level four. It was decided that two or more hops in succession would be sufficient to make a determination of behavioral consistency.

**Throwing.** In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient. The distance between the child and the examiner at levels three and four was changed to ten and fifteen feet respectively to facilitate a performance within the child's capabilities.

A significant component of the test condition which was discovered during the video-taping sessions was the request, "Can you throw the ball as hard as you can?" With this cue, the child was likely to demonstrate the most mature pattern of which he was capable.

Additions to level four which more accurately described the mature throwing pattern were wrist snap upon releasing the ball and trunk rotation especially as it relates to a clearer delineation of the process after stepping onto the lead foot.

**Catching.** Relative to the test condition, one respondent suggested that clarification was necessary as to how the examiner delivered the ball. It was decided that the ball should be thrown
underhand; it should reach the child between shoulder and waist level, and it should be thrown in an arc as opposed to being thrown on a direct line.

At level three, it was suggested that the phrase, jaws of a vice, was not informative. To avoid this problem, the phrase, clapping motion, was substituted.

Jumping. Relative to the test condition, the use of the test sheet as the minimum length for an acceptable performance was criticized. The rationale for using the test sheet came from the Denver Developmental Screening Test; however, the criticism was considered important enough to suggest in the revision that depending on the age and/or size of the child he be encouraged to jump as far past the test sheet as possible. If necessary this can be communicated to the child by slapping the floor well in front of the test sheet.

At level one the instrument was criticized because of the developmental inequality of its three components. Since a developmental hierarchy did exist and since the third component was more advanced, it was decided that "c" would become the criterion for level one, while the remaining two components would become teaching-learning experiences subsumed under this level.

The description of the feet in the landing position, i.e., straddled, was a point of confusion at level three. In the revision the term was changed to "spread." In terms of the arm swing at this level, the option of a forward swing was eliminated, because with it levels three and four would have been almost identical. The criteria at both levels was expanded to include the maintenance of balance on.
landing without touching the floor with the hands. This was considered a logical addition because of its emphasis in the developmental literature.

At level four an omission was rectified when the movement of the arms was expanded to include swinging the arms backwards initially. In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

Kicking. The manner in which the child approached the ball in all levels was an expressed concern on the part of the evaluators. In light of this concern and the nature of the behaviors expected, it was resolved that the child should walk up to the ball at the first two levels and run up to the ball at the last two levels.

In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

Striking. There were two criticisms pertaining to the test equipment, namely, the indefinite bat size and the confusion over "tether ball effect." To avoid any problems, the parameters of the bat's length were specified. The confusion involving the "tether ball effect" was resolved by describing this mechanism in detail.

At level four, the list of performance behaviors was rearranged to more closely coincide with the actual sequence of events in striking; this included the addition of a twisting phase as it relates to the trunk.
In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

**Skipping.** Definitions were requested in level one for those skills listed as possible responses. Since running and hopping were included in the instrument, only galloping and leaping were defined. At level two the arm position was challenged; an additional review of the literature verified that, in fact, the arms were more likely to be in a high guard position as described in the revision.

It was suggested that a minimal number of skips either attempted or actually performed in succession be included as part of the criterion measure for levels two, three, and four. It was arbitrarily decided that four or more skips in succession would be sufficient to make a determination of behavioral consistency.

In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

**Ladder Climbing.** After applying this part of the instrument on several occasions, it was obvious that the hands and feet moved asynchronously and too quickly to be accurately observed in the emerging pattern. Since the literature describes only the pattern of the feet, the decision was made to eliminate the movement of the hands from the performance measure. Application disclosed another weakness,
namely, the inability to observe the climbing pattern in only two steps. To better facilitate observation of the pattern, the number of steps was changed from two to three or more.

At levels two and three, the phrase, dominant foot leading, was eliminated because of the confusion over what was the dominant foot. The problem was resolved by emphasizing the two foot landing on each rung.

In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.

Stair Climbing. Another option was added to the list of possible behaviors at level one. It consisted of maneuvering on the steps in the hands and feet position.

At levels two and three, the phrase, dominant foot leading, was eliminated because of the confusion over what was the dominant foot. The problem was resolved by emphasizing the two foot landing on each step.

In order to more clearly delineate the difference between levels three and four, level three was altered to convey climbing which was supported and not independent like level four.

In response to the request to verify the number of trials permitted at each level, it was decided that two out of three trials was sufficient.
Summary of SIGMA Evaluation

The responses from eleven evaluators which had been categorically arranged were reviewed by this investigator and his major advisor. After this process was completed, the information was used to revise O.S.U. SIGMA. The revised O.S.U. SIGMA can be seen in Appendices C, D, and E.

Subsequent to revising the instrument, it was necessary to determine if it could be practically applied in a reliable manner. A test-retest reliability study was then designed and implemented for that purpose.

RELIABILITY STUDY ON O.S.U. SIGMA

Analysis of O.S.U. SIGMA Reliability Study

Thirteen judges viewed the video taped performances of twelve children, ages two and one-half years to fourteen years, who were administered the O.S.U. SIGMA. A test-retest reliability study was implemented whereby the judges observed and rated the performances of all twelve children on one night and one week later viewed the identical tapes. At the conclusion of the test-retest process, the raw data were submitted to computer analysis.

The data emanating from the reliability study conducted on O.S.U. SIGMA were analyzed with Scott's Pi which produced test reliability coefficients for inter- and intra-judge agreements on a test-retest basis for each of eleven skills. Additionally the percentage of agreement between judges was computed for inter- and
intra-judge relationships on a test-retest basis for each skill; this produced the statistic referred to as scorer reliability.

The analysis of the data and the presentation of the data matrices are performed singularly for each skill. The data matrices which are presented in Appendix F are a combination of the test-retest results. The results of the test condition are displayed above and to the right of the diagonal, while the retest results can be found below and to the left of the diagonal.

Walking. One divergent response was recorded during the test condition of this study. This produced the following range of pi coefficients in the test condition: -5.519 to 1.0000. The median pi was 1.0000. In the retest condition, the nature of the responses, i.e., all judges observed the same level of performance in all subjects, produced a computational inadequacy in Scott's Pi which prohibited its use with this skill. In its place scorer reliability, percent agreement among judges, was substituted. With respect to inter- and intra-judge reliabilities and inter- and intra-scorer reliabilities, the coefficients and percentages obtained in all cases were equal to 1.00.

Running. The following ranges of pi coefficients were produced for inter-judge reliability in the test and retest conditions: -.2947 to .7123 and -.5933 to 1.0000 respectively. The median pi for each was .2807 and .3361. In both the test and retest conditions, scorer reliability was .5833.
Intra-judge reliability coefficients for pi ranged from -.1707 to 1.0000 with a median pi of .5294. Scorer reliability was calculated at .7500 on intra-judge agreement.

**Hopping.** The ranges of pi coefficients for inter-judge reliability in the test and retest conditions were as follows: .1238 to 1.0000 and .1778 to 1.0000 respectively. The median pi for each was .4993 and .5302. In both the test and retest conditions, scorer reliability was .6667.

The following range of pi coefficients was produced for intra-judge reliability: .2690 to 1.0000 with a median pi of .5271. Scorer reliability was calculated at .6667 on intra-judge agreement.

**Throwing.** The following ranges of pi coefficients were produced for inter-judge reliability in the test and retest conditions: .1325 to 1.0000 and .3929 to 1.0000 respectively. The median pi for each was .5662 and .5447. In both the test and retest conditions, scorer reliability was .7500.

Intra-judge reliability coefficients for pi ranged from .4251 to .8717 with a median pi of .8168. Scorer reliability was calculated at .9167 on intra-judge agreement.

**Catching.** The ranges of pi coefficients for inter-judge reliability in the test and retest conditions were as follows: .2196 to 1.0000 and .3207 to 1.0000 respectively. The median pi for each was .8139 and .8302. In both the test and retest conditions, scorer reliability was .9167.
The following range of pi coefficients was produced for intra-judge reliability: .1933 to 1.0000 with a median pi of .8367. Scorer reliability was calculated at .9167 on intra-judge agreement.

Jumping. The following ranges of pi coefficients were produced for inter-judge reliability in the test and retest conditions: -.7740 to .8522 and -.1731 to 1.0000 respectively. The median pi for each was .2608 and .2668. In both the test and retest conditions, scorer reliability was .5833.

Intra-judge reliability coefficients for pi ranged from -.1309 to .7073 with a median pi of .3557. Scorer reliability was calculated at .6667 on intra-judge agreement.

Kicking. The ranges of pi coefficients for inter-judge reliability in the test and retest conditions were as follows: -.2232 to .7282 and -.3286 to 1.0000 respectively. The median pi for each was .1846 and .4095. In the test and retest conditions, scorer reliability was .5000 and .6667 respectively.

Intra-judge reliability coefficients for pi ranged from -.1566 to .7160 with a median pi of .4667. Scorer reliability was calculated at .7500 on intra-judge agreement.

Striking. The following ranges of pi coefficients were produced for inter-judge reliability in the test and retest conditions: -.1600 to 1.0000 and -.0921 to 1.0000 respectively. The median pi for each was .5650 and .6360. In the test and retest conditions, scorer reliability was .7500 and .8333 respectively.
The following range of pi coefficients was produced for intra-judge reliability: .1628 to 1.0000 with a median pi of .6000. Scorer reliability was calculated at .8333 on intra-judge agreement.

**Skipping.** The ranges of pi coefficients for inter-judge reliability in the test and retest conditions were as follows: .1598 to 1.0000 and .3394 to 1.0000 respectively. The median pi for each was .5799 and .6697. In the test and retest conditions, scorer reliability was .7500 and .8333 respectively.

The following range of pi coefficients was produced for intra-judge reliability: .3514 to 1.0000 with a median pi of .8222. Scorer reliability was calculated at .9167 on intra-judge agreement.

**Ladder Climbing.** The following ranges of pi coefficients were produced for inter-judge reliability in the test and retest conditions: .7416 to 1.0000 and .7465 to 1.0000 respectively. The median pi for each was 1.0000. In both the test and retest conditions, scorer reliability was 1.0000.

Intra-judge reliability coefficients for pi ranged from .7405 to 1.0000 with a median pi of 1.0000. Scorer reliability was calculated at 1.0000 on intra-judge agreement.

**Stair Climbing.** The ranges of pi coefficients for inter-judge reliability in the test and retest conditions were as follows: .6163 to 1.0000 and .6211 to 1.0000 respectively. The median pi for each was 1.0000 and .8737 respectively. In the test and retest conditions, scorer reliability was 1.0000 and .9167 respectively.
The following range of pi coefficients was produced for intra-judge reliability: 0.747 to 1.0000 with a median pi of 1.0000. Scorer reliability was calculated at 1.0000 on intra-judge agreement.

**Summary**

The results of the judges' ratings on the test-retest study were analyzed for test reliability and scorer reliability. Test reliability was established using Scott’s Pi, while scorer reliability was based on percent agreement.

Each skill was analyzed individually. In terms of inter-judge agreement, a range of coefficients and percentages in addition to the median coefficient and percentage were reported for both the test and retest conditions. With respect to intra-judge agreement, the range and median coefficient and percentage were reported for each skill.

Since large differences were reported in the test and scorer reliabilities among the individual skills which collectively make up O.S.U. SIGMA, an interpretation of these differences, i.e., why they occurred and what they mean, was considered essential.

**Interpretation of O.S.U. SIGMA Reliability Study**

This section purports to explain the findings of the reliability study conducted on O.S.U. SIGMA. The interpretation will focus on two basic considerations, test reliability and scorer reliability, i.e., percent agreement between judges.

The data will be interpreted categorically according to retest fluctuations in Scott's Pi; however, each skill will be singularly examined within categories.
Identical Retest Pi. Two skills, walking and ladder climbing, produced identical median scores for test and scorer reliability in the test and retest conditions. The high reliability in walking was attributed not only to the clear distinction between levels three and four but also to the age of the children in the study, i.e., the youngest was two and one-half years of age. Children were chosen who could display at least a minimal level of performance on each skill in the test; a child who was walking at less than level four would not have been able to perform every task in the instrument.

In ladder climbing, high reliability was attributed to the clear distinction among the levels.

Lower Retest Pi. Lower median pi coefficients in the retest condition were recorded for throwing, catching, and stair climbing. With throwing and catching, the judges agreed less in the retest condition but only enough to affect Scott's Pi and not enough to affect scorer reliability which was identical in both skills.

Notwithstanding the low test-retest reliability coefficients, i.e., .5662 and .5447, respectively for throwing, the higher intra-judge and scorer reliabilities, when considered together, were indicative of a reasonably consistent approach to observing the levels of performance as defined for this skill.

Unlike throwing, catching produced test-retest reliability coefficients of .8139 and .8302 respectively, which were more contiguous to its corresponding scorer reliability of .9167. When these data
are combined with an intra-judge reliability of .8367, the indication is that the behaviors are defined clearly enough to permit reasonably good discrimination across four levels of performance.

Stair climbing, on the other hand, experienced a decrease in both test and scorer reliabilities on the retest condition. The decline can be attributed to an increased awareness on the part of the judges regarding the number of consecutive steps during which a particular pattern or level of performance was demonstrated.

**Higher Retest Pi.** The following six skills experienced an increase in Scott's Pi in the retest condition: running, hopping, jumping, kicking, striking, and skipping. The increases in running, hopping, and jumping were not significant enough to change the scorer reliabilities which remained constant in both the test and retest conditions. In contrast, the increases in the other three skills were significant enough to alter scorer reliabilities in the retest condition.

Running and hopping produced low test-retest reliability coefficients, i.e., .2807 and .3361 and .4993 and .5302, respectively. Running had a stable scorer reliability of .5833 with an intra-judge reliability of .5294, while hopping had a constant scorer reliability of .6667 with an intra-judge reliability of .5271. Although the judges agreed on fifty-eight and sixty-seven percent of the running and hopping observations respectively, the low inter-judge and intra-judge reliability tend to substantiate the lack of clearly defined behaviors in the various levels of these skills.
Jumping exhibited low test-retest reliability coefficients, i.e., .2608 and .2668. Although scorer reliability was constant at .5833, the low intra-judge reliability, .3557 in conjunction with the low test-retest reliability results confirm the lack of clearly defined levels of behavior in this skill.

Kicking produced a marked increase in the retest condition, .4095, as compared to .1816 in the test condition. Scorer reliability increased from .5000 to .6667. The low intra-judge reliability, .4667, can be attributed to the increase in the retest condition. It seems likely that the test condition served as a learning medium which increased the potential of the judges to make homogeneous decisions.

Striking exhibited test-retest reliability coefficients of .5650 and .6360; scorer reliabilities were .7500 and .8333 respectively. The low intra-judge reliability, .6000, can be attributed to the increase in the retest condition. As was the case with kicking, the test condition served as a learning medium.

Skipping produced test-retest reliability coefficients of .5799 and .6697; scorer reliabilities were .7500 and .8333. The intra-judge reliability of .8222 suggests that the judges made a few discrete changes in the retest condition which cumulatively affected the inter-judge relationships but did not significantly affect the intra-judge reliability.

Summary

An attempt was made to interpret the data categorically according to retest fluctuations in Scott's Pi. As a result of this interpretation, it was possible to divide the individual skill into three test
reliability categories: high, medium, and low. These categories were arbitrarily established based on the distribution of reliability coefficients.

High reliability was indicative of those skills with an average coefficient of .83 or better on the test and retest conditions; the skills in this category included: walking, catching, ladder climbing, and stair climbing. Skills with an average coefficient of .54 or higher were considered to have medium reliability; throwing, striking, and skipping were included in this category. Low reliability was produced for running, hopping, jumping, and kicking and consisted of an average coefficient of .53 or lower on the test and retest conditions.

During the interpretation, reasons were posited that attempted to explain the medium and low test reliability results. The reasons that were given for the poor reliability were directly related to either the delineation of the behaviors into identifiable levels of performance or to the interaction between the inter- and intra-judge relationships.

There are some additional cause and effect relationships which are related to reliability in general and Scott's Pi specifically. The outcome of this study could conceivably have been influenced by any or all of these relationships which will be discussed in the next section.

**Discussion of Results**

The following discussion is presented in an effort to explain the inordinate range of test-retest reliability coefficients for running, hopping, throwing, jumping, kicking, striking, and skipping.
The discussion involves both theoretical and intuitive considerations as they relate to select principles of reliability in general and to Scott's Pi specifically.

**Reliability in General Terms.** The following rationale are presented as possible causes for the inordinate reliability in certain skills in this study: problems associated with the coefficient of stability and the number of judges employed in the study.

The coefficient of stability is associated with the test-retest method of establishing reliability; it is also the one which is imperiled by the greatest number of major sources of unreliability, e.g., the test itself, the time between administration, and the interaction of various temporary factors (Wesman, 1952). Regarding the test itself, poor reliability in this study can be partially attributed to a lack of clearly distinguishable behaviors among the levels of specific skills. The length of time needed to complete each phase of the test-retest study was four hours; this amount of time was no doubt fatiguing and could have had an adverse effect on the study. Additionally the directions which were given to the judges by this investigator could have been more explicit especially in the retest condition.

Relative to the time between administrations, the period of one week was considered sufficient to reduce any significant "carryover." Nine skills experienced shifts in their retest coefficients which seems to indicate that differential growth, i.e., learning, was having an effect on the retest observations. The differential
growth was probably the result of having the opportunity to observe and rate the children in the test condition.

Certain temporary factors, the physical and emotional well-being of the judges as well as the administrative procedures used in the study, could have had an adverse effect on the results. It was obvious that one judge was having personal problems and should have been eliminated. Additionally, the study was performed in the evenings when the judges after working and going to class all day were probably least alert.

One other factor which is critical to any study concerned with reliability is the number of persons employed in the study. Because of the temporal demands of this study, it proved difficult to obtain the services of more than thirteen judges; therefore, this study is based on a small N. It is a fact that if one wants to increase reliability he should increase N.

Scott's Pi. The nature of the data, i.e., nominal, prohibited the use of any statistic that was predicated on the assumption of interval data. Consequently, the data were analyzed using Scott's Pi which because of certain intrinsic difficulties compounded the problems associated with obtaining relatively high test reliability.

First, Scott's Pi operates most effectively when the population is large (N=1000). Obviously this study is far short of that total and assumes the limitation associated with the small N.

A major difficulty, which is idiosyncratic to Scott's Pi and which is a function of the number of different levels chosen in
relation to the majority of levels chosen, is the production of negative coefficients. At worst the researcher expects no correlation, i.e., perfect disagreement is zero, but never a negative correlation.

With Scott's Pi, the negative coefficient of correlation is not only a reality, but it is likely even when there is agreement, e.g., two agreements out of twelve observations. Since components of Scott's Pi are based on probability theory, the negative coefficient is indicative of agreement/disagreement which is less than that which could be expected by chance.

Intuitively, it seems logical to assume that when two sets of judgements are compared, and there is agreement on even one case then there is a correlation which should be reflected by a positive coefficient. In the case of Scott's Pi, no such assumption can be made since there are cases in this study where judges have had minimal to near maximal agreement which has produced the negative coefficient of correlation.

To carry this one step further, it seems likely that if negative coefficients are being generated when there is agreement then the positive coefficients that have been recorded may be conservatively biased, i.e., lower than they should be, by an undetermined magnitude.

Summary
In an effort to explain what would be considered low test reliability by conventional standards, numerous theoretical and intuitive considerations were discussed. These included some basic understanding of reliability in general, Scott's Pi in particular, and their effect on the outcome of this study specifically.
With the conclusion of the reliability study, the first major part of this investigation was completed, i.e., development of an assessment instrument which is based on an intra-task analysis. The second part of this study was concerned with the development of a performance-based curriculum which when combined with the assessment instrument would facilitate individual programming in physical education for pre-school moderately retarded children.

EVALUATION OF O.S.U. PBC

Analysis of PBC Materials Evaluation

This section is designed to analyze the responses of those individuals who reviewed the O.S.U. PBC materials via the Materials Evaluation Form for each skill. Copies of the curriculum were sent to twenty-four evaluators in three installments at three week intervals; 22 (or 91.9%) evaluations were returned on each of the first two sets, while 21 (or 87.5%) evaluations from the third set were returned.

Frequency counts are provided for those questions on the Materials Evaluation Form which could have been answered in a yes-no fashion and serve as the basis for this descriptive analyzation.

Walking. Twenty-two evaluators responded to the curriculum materials on walking. Twelve evaluators reviewed the materials from both a theoretical and practical perspective; nine respondents viewed the materials only theoretically, while one individual based her responses on a practical implementation only.

With respect to the questions on behavioral objectives, twenty or more evaluators were affirmative in their responses. Two respondents
were concerned with the clarity and the developmental appropriateness of the objectives.

Seventeen or more evaluators were affirmative in their responses to the teaching-learning experiences. Five were critical of clarity, while four were concerned with the sequencing of the teaching-learning experiences and their potential for attaining the behavioral objective. The complete list of response frequencies for each question can be seen in Table 13, page 117.

Running. Of the twenty-two evaluators who responded to the materials on running, twelve evaluators reviewed the materials from both a theoretical and practical perspective. Seven respondents employed only a theoretical evaluation, while two persons based their responses on a practical implementation only.

Nineteen or more evaluators were affirmative in their responses to the questions on behavioral objectives. Four respondents were concerned about the desirability of a specific objective(s). Three persons were critical of the clarity of a specific objective(s).

Fourteen or more evaluators were satisfied with the teaching-learning experiences. Five respondents were critical of sequencing; four were concerned with clarity. Table 13, page 117, contains the complete list of response frequencies for each question.

Hopping. Eleven evaluators reviewed the materials on hopping from both a theoretical and practical framework. Additionally, ten more reviewed the materials only theoretically; one person based her response on a practical implementation only.
With respect to the questions on behavioral objectives, twenty or more evaluators were affirmative in their responses. Three respondents were concerned with clarity, while two were critical of sequencing.

Eighteen or more evaluators were satisfied with the teaching-learning experiences. Three reviewers were concerned with sequencing here also. The complete list of response frequencies for each question can be seen in Table 13, page 117.

**Throwing.** Ten evaluators reviewed the materials on throwing by utilizing a combination of theoretical and practical implementation. Ten reviewers used only a theoretical approach, while one person based her response on a practical implementation only.

Twenty or more evaluators were affirmative in their responses to the questions on behavioral objectives. One respondent was concerned with each of three questions: clarity, specified accountability, and developmental appropriateness.

Sixteen or more evaluators were satisfied with the teaching-learning experiences. Five reviewers expressed a concern for clarity. Two were critical of sequencing. Table 13, page 117, contains the complete list of response frequencies for each question.

**Catching.** Twelve evaluators reviewed the materials on catching from both a theoretical and practical framework. Nine respondents employed a theoretical approach only.

With respect to the questions on behavioral objectives, seventeen or more evaluators were affirmative in their responses. Three respondents were concerned about clarity.
Sixteen or more evaluators were satisfied with the teaching-learning experiences. Four respondents were concerned with sequencing and clarity. The complete list of response frequencies for each question can be seen in Table 13, page 117.

Jumping. Nine evaluators reviewing the materials on jumping from both a theoretical and practical perspective. Eleven reviewers used only a theoretical approach, while one person based her response on a practical implementation only.

Nineteen or more evaluators were affirmative in their responses to the questions on behavioral objectives. Two respondents were concerned about clarity, while two additional evaluators were concerned about desirability of a specific objective(s).

Sixteen or more evaluators were satisfied with the teaching-learning experiences. Four respondents were critical of sequencing. Table 13, page 117, contains the complete list of response frequencies for each question.

Kicking. Ten evaluators reviewed the materials on kicking from both a theoretical and practical perspective. Ten reviewers used only a theoretical approach, while one person based her response on a practical implementation only.

With respect to the questions on behavioral objectives, all twenty-one evaluators responded affirmatively.

Nineteen or more evaluators were satisfied with the teaching-learning experiences. Two reviewers were critical of sequencing,
while two additional reviewers were concerned that the teaching-learning experiences seemed to lack motivational properties. The complete list of response frequencies for each question can be seen in Table 13.

**Striking.** Eleven evaluators reviewed the materials on striking from both a theoretical and practical perspective. Eight reviewers used only a theoretical approach, while one person based her response on a practical implementation only.

Nineteen or more evaluators were affirmative in their responses to the questions on behavioral objectives. Two respondents were concerned about the desirability of a specific objective(s).

Sixteen or more evaluators were satisfied with the teaching-learning experiences. Five reviewers were concerned about clarity. Table 13 contains the complete list of response frequencies for each question.

**Skipping.** Ten evaluators reviewed the materials on skipping from both a theoretical and practical perspective. Eleven reviewers used only a theoretical approach while one person based her response on a practical implementation only.

Twenty or more evaluators were affirmative in their responses to the questions on behavioral objectives. Three respondents were concerned about the desirability of a specific objective(s). Two evaluators were concerned with clarity and specified accountability.

Seventeen or more evaluators were satisfied with the teaching-learning experiences. Three respondents were critical of sequencing.
The complete list of response frequencies for each question can be seen in Table 13.

**Ladder Climbing.** Ten evaluators reviewed the materials on ladder climbing from both a theoretical and practical perspective. Nine reviewers used only a theoretical approach, while two persons based their responses on a practical implementation only.

With respect to the questions on behavioral objectives, seventeen or more evaluators were affirmative in their responses. Four respondents were concerned with clarity.

Eighteen or more evaluators were satisfied with the teaching-learning experiences. Five respondents were concerned with clarity; three were concerned that the teaching-learning experiences lacked the potential for attaining the behavioral objective. Table 13 contains the complete list of response frequencies for each question.

**Stair Climbing.** Eleven evaluators reviewed the materials on stair climbing from both a theoretical and practical perspective. Ten reviewers used only a theoretical approach, while one person based her response on a practical implementation only.

Twenty or more evaluators were affirmative in their responses to the questions on behavioral objectives. Three respondents were concerned with clarity.

Nineteen or more evaluators were satisfied with the teaching-learning experiences. One respondent was concerned about clarity, while another was concerned that the teaching-learning experiences
lacked the potential for attaining the behavioral objective. The complete list of response frequencies for each question can be seen in Table 13.

Summary

Copies of the O.S.U. PBC were sent to twenty-four evaluators in three installments at three week intervals. Responses were tabulated and frequency counts provided for those questions on the Materials Evaluation Form which could have been answered in a yes-no fashion. Each skill was analyzed individually in terms of: the nature of the evaluation, i.e., theoretical, practical, or a combination of both, the behavioral objectives, and the teaching-learning experiences.

After analyzing the results of the materials evaluation, the final phase of the study was ready to commence, i.e., curriculum revision.

Interpretation of O.S.U. PBC Evaluation

Subsequent to analyzing the evaluative responses on the first draft of O.S.U. PBC, the results were used to revise the materials. The following discussion will highlight those comments made on the curriculum materials themselves, as well as those comments written as part of a "no" response on the Materials Evaluation Form. Each skill is discussed singularly.

It should also be understood that additional changes have been made by this investigator and his major advisor when such changes were expedient.

The revised copy of O.S.U. PBC can be found in Appendix G with the changes underlined for the convenience of the reader.
<table>
<thead>
<tr>
<th>Questions</th>
<th>Walking N=22</th>
<th>Running N=22</th>
<th>Hopping N=22</th>
<th>Throwing N=21</th>
<th>Catching N=21</th>
<th>Jumping N=22</th>
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<tr>
<td>I. Behavioral Objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Sequential?</td>
<td>Yes</td>
<td>No</td>
<td>Both</td>
<td>Yes</td>
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<td>2. Written clearly?</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>19</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3. Specified in accountable terms?</td>
<td>22</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>1</td>
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<tr>
<td>4. Appropriate (desirable)?</td>
<td>22</td>
<td>-</td>
<td>-</td>
<td>19</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. Developmental?</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>19</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>II. Teaching-Learning Experiences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Sequential?</td>
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<td>1</td>
<td>1</td>
<td>14</td>
<td>5</td>
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<td>5</td>
<td>1</td>
<td>16</td>
<td>4</td>
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<tr>
<td>3. Potential for attaining behavioral objective</td>
<td>17</td>
<td>1</td>
<td>-</td>
<td>16</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>4. Sufficient motivational properties</td>
<td>19</td>
<td>1</td>
<td>-</td>
<td>16</td>
<td>3</td>
<td>-</td>
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## Table 13 (continued)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Kicking N=21</th>
<th>Striking N=21</th>
<th>Skipping N=22</th>
<th>Ladder Climbing N=22</th>
<th>Stair Climbing N=22</th>
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<td>Yes No Both</td>
<td>Yes No Both</td>
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<tr>
<td>1. Sequential?</td>
<td>21 - -</td>
<td>21 - -</td>
<td>21 1 -</td>
<td>22 - -</td>
<td>22 - -</td>
</tr>
<tr>
<td>2. Written clearly?</td>
<td>21 - -</td>
<td>21 2 -</td>
<td>21 2 -</td>
<td>21 4 1</td>
<td>22 3 1</td>
</tr>
<tr>
<td>3. Specified in accountable terms?</td>
<td>21 - -</td>
<td>21 - -</td>
<td>21 2 -</td>
<td>21 - -</td>
<td>21 1 -</td>
</tr>
<tr>
<td>4. Appropriate (desirable)?</td>
<td>21 - -</td>
<td>19 2 -</td>
<td>21 3 -</td>
<td>21 - -</td>
<td>21 - -</td>
</tr>
<tr>
<td>5. Developmental?</td>
<td>21 - -</td>
<td>20 1 -</td>
<td>21 - -</td>
<td>20 - -</td>
<td>21 1 -</td>
</tr>
</tbody>
</table>

II. Teaching-Learning Experiences

<table>
<thead>
<tr>
<th>Questions</th>
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<th>Striking N=21</th>
<th>Skipping N=22</th>
<th>Ladder Climbing N=22</th>
<th>Stair Climbing N=22</th>
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<td>1. Sequential?</td>
<td>19 2 -</td>
<td>20 - -</td>
<td>17 3 1</td>
<td>19 2 -</td>
<td>21 - -</td>
</tr>
<tr>
<td>2. Written clearly?</td>
<td>20 1 -</td>
<td>19 1 -</td>
<td>18 5 2</td>
<td>21 1 1</td>
<td></td>
</tr>
<tr>
<td>3. Potential for attaining behavioral objective</td>
<td>20 1 -</td>
<td>19 1 -</td>
<td>21 - -</td>
<td>18 3 -</td>
<td>21 - -</td>
</tr>
<tr>
<td>4. Sufficient motivational properties</td>
<td>19 2 -</td>
<td>20 1 -</td>
<td>19 1 -</td>
<td>19 1 -</td>
<td>19 1 -</td>
</tr>
</tbody>
</table>
Walking. In level one the first objective was clarified, i.e., "sitting back on his legs" was expanded to include "with knees and lower legs on the ground." The first two learning experiences were reordered because of the difficulty factor.

At level two the third learning experience was altered, i.e., support was added to more closely approximate the objective and the time factor was decreased. An additional experience, cruising and stepping over objects, caused a reordering in the last two experiences in the progression.

The first objective at level three was expanded to include a starting position away from surrounding support objects; the intent was to facilitate independent standing. Because the first learning experience did not appear to effectively promote attainment of the objective, it was amplified to include standing from an upright kneeling position. Two additional learning experiences which gradually decreased the amount of support needed and which began to approximate more closely the behavioral objective were added to the progression.

Since the type of walking pattern requested in the second objective of level three was an immature one, the description of the pattern was eliminated from the objective per se and added parenthetically as a characteristic walk at this level. The objective was then rewritten emphasizing an alternate stepping pattern.

With the exception of changing the term, "cross-pattern" to "alternating pattern" to avoid confusion, level four remained unchanged.
There were additions and a subsequent reordering of the supplementary activities; these and other changes in the walking materials can be found in Appendix G.

**Running.** The primary problem at level one was the reordering of a faulty learning experience progression. This involved the first three experiences.

In the second learning experience for the first objective at level two, there was confusion involving the position of the arms; it was expanded to emphasize holding the arms at right angles. A third learning experience, marching, was added to the progression.

There was an addition to the learning experiences under the second objective at this level also. It consisted of walking between boundaries of steadily decreasing widths; it caused a reordering of the progression.

According to the evaluations, the second objective at level three was confusing in terms of the movement of the legs. The phrase, "swings the legs so that the knees remain under the hips," was substituted in an attempt to clarify the problem.

In the third objective the phrase, "using both feet as take off and landing feet," was also confusing to the evaluators. An attempt was made to clarify the objective by substituting the phrase, "by alternating take off and landing feet." The same phrase which was causing problems in the objective was removed from the third learning experience. A fourth experience which more closely approximated the objective was added to the progression; it consisted of large steps or leaps onto footprints.
At level four the first objective was confusing to the evaluators for the same reason as the third objective at the previous level; it was clarified by substituting the same phrase. One supplementary activity, shuttle run relays, was suggested and added to the progression. This and other revisions in the running materials can be found in Appendix G.

**Ladder Climbing.** Apparently there was some doubt as to the nature of the climbing apparatus in the objective at level one; therefore, it, a ladder, was clearly specified. With the exception of the third experience, all of the other experiences were in need of minor clarification according to the evaluators. Revisions were then performed for that purpose. The second and third experiences were reordered because of the difficulty factor.

In the objective at level two, the evaluators suggested that in order to better facilitate observation of the climbing pattern the number of steps be increased. Empirically this investigator also found this to be of practical concern; the number of steps was changed to three-five.

The first learning experience at this level was revised because of the confusion involving the phrase, "hands and feet position." Parenthetically, it was referred to as the "bear walking position." In the sixth learning experience the term, "mark time" was obviously unfamiliar to some evaluators; therefore, it was defined as a two foot landing on each rung.
To better facilitate observation of the climbing pattern in levels three and four, the number of steps in the objectives was likewise increased to three-five.

The evaluators were critical of the emphasis on the dominant foot lead at levels two, three, and four; they suggested that establishment of a dominant foot was difficult with young moderately retarded children. To avoid confusion the phrase was eliminated from the three objectives. Emphasis was then centered on a two foot landing on each rung.

All of the revisions in the ladder climbing materials can be found in Appendix G.

**Stair Climbing.** At each level the evaluators requested verification on the height of the step to be used in attaining the objectives. Because of the nature and frequency of the task in normal everyday situations, it was decided that a maximum height of eight inches was sufficient.

At level two the phrase, dominant foot lead, was eliminated from both objectives for the same reason it was eliminated from ladder climbing. Regarding the learning experiences for the first objective, one experience, walking up an incline, was added which preceded walking up the steps in the progression. A similar suggestion was made for the second objective, i.e., walking down an incline; it preceded walking down the steps in the progression.

For the second learning experience in the first objective at level three, the suggestion was made that footprints be utilized in
this experience. Since this would provide extra sensory input and conceivably facilitate completion of the task, it was included.

At level four, the suggestion was again made that footprints be used. This time in conjunction with learning experiences two and three for both objectives at this level. For reasons cited previously there inclusion was warranted.

All of the revisions in the stair climbing materials can be found in Appendix G.

**Skipping.** At level one there was some concern on the part of the evaluators that the child was performing only with his preferred foot; it was their opinion that the child should be able to gallop using either foot in the lead role. In order to promote this kind of diversity the instructor via the curriculum was encouraged to repeat the same learning experiences with the non-preferred foot.

The fourth learning experience at level two was confusing to the evaluators. After rereading it, their confusion was understandable. The experience was rewritten. At levels three and four, an identical experience was likewise rewritten for the same reason.

All of the revisions in the skipping materials can be found in Appendix G.

**Hopping.** The evaluations indicated some concern over the use of the term, "hop" in the objective at level one. Since by definition hopping is performed on one foot, it was decided that the term, "jump" would be better suited in this case. It was also suggested that three consecutive jumps would be a better performance measure than
two jumps. Since the individual making this suggestion had consid-
erable experience, the decision was made to change the criterion to
three jumps.

Suggestions for additional learning experiences at level one
included: jumping in place and jumping forward over low objects;
these additions caused a reordering of the progression.

At level two, the suggestion was made that an intermediate step
to withdrawing support from the fifth learning experience (parts b. and
d.) would be the use of a rope. The suggestion was incorporated into
the experience as it existed.

It was suggested that hopping in place could be an additional
learning experience at level three. It was included, and it caused
a slight reordering of the progression.

At level four a suggestion, similar to that in level one, was
made to increase the number of consecutive hops in the objective.
Again for the same reason, the decision was made to change the criterion
to three hops.

Regarding the first two learning experiences at this level,
concern for the position of the arms prompted inclusion of the state-
ment, "encourage child to keep arms away from body to permit free
swinging action."

Two experiences were suggested for the list of supplementary
activities which caused a reordering of the progression. These and
other changes in the hopping materials can be found in Appendix G.
Jumping. At level one the learning experiences were criticized for not promoting the objective. In answer to that criticism, a fourth experience was added to the sequence which provided the needed competency, i.e., landing on two feet.

It was suggested that an experience was needed in which the child jumped in place. The experience was added, and it caused a slight reordering of the progression.

In the first objective at level three, there was some concern and confusion involving the fourth learning experience. An attempt was made to clarify the experience by adding a description of the starting position for the arms and by describing more clearly the bent knees position.

At level four concern was expressed relative to the lack of distance required, i.e., 18-24 inches, in the objective. The decision was made to leave the distance unchanged; however, a supplementary statement was added to the objective which acknowledged the fact that the child should be encouraged to jump as far as possible.

With respect to the learning experiences at this level, it was suggested that the child jump forward from a springboard. This addition along with the reversal of the second and third experiences because of a difficulty factor caused a reordering of the progression.

All of the revisions in the jumping materials can be found in Appendix G.

Catching. In the objective at level one, there was confusion expressed over the use of the terms, "track" and "scoop." To overcome this problem, track was changed to "follow" and scoop was parenthetically
defined as "basket." At level one the evaluators were concerned that
the nature and location of the ball in the first four learning experi-
ences was not specified. This was clarified by explaining that the
ball was suspended. The location of the fifth learning experience in
the progression was criticized; it was consequently moved to the last
position in the progression.

At level three the position of the hands in catching was an
evaluative concern; to avoid confusion the position, i.e., palms up,
was clarified. The use of balloons in the learning experiences at
this level was criticized and subsequently changed. In their place
yarn balls were substituted. The use of a ball was also included
as an additional component of each experience. Because of the changes
made in the first five experiences, there was no longer any need for
the sixth and seventh experiences.

Additionally some suggestions for the list of supplementary
activities were included in the revision. These and other changes
in the catching materials can be found in Appendix G.

Throwing. Two concerns were expressed relative to the objective
at level one, namely, the lack of movement in the feet and the lack
of a specified use of the arms. In order to alleviate problems, it
was decided that the feet were not the primary concern, rather the
arms were; therefore, the feet conceivably could move in this situation.
Relative to the arms, the manner was considered inconsequential, as
long as the child executed the throw with two hands on the ball.
Because of the emphasis on release in the first learning experience at level one, the child's position was altered to standing. The fifth and sixth experiences were reversed because of the difficulty factor.

At level two the term, "sidearm", in the objective seemed to cause confusion; it was clarified by adding the term, "overhand." According to the evaluators, the first learning experience was confusing; in an attempt to clarify it, the standing position was defined more specifically, and a part of the experience was extracted and made a secondary component of the original experience.

The objectives at levels three and four were both altered in the same manner, as the objective in level two was altered. According to the evaluations the learning experiences at level four were in need of considerable clarification. Primarily, the positions of the body in relation to the targets were confusing. These were altered to describe the position in terms of: the side of the body or the front of the body. Direction as it related to a step forward was changed to convey stepping "in the direction of the target."

The eighth learning experience was criticized because it failed to specify the position of the body. The position, i.e., lying on the abdomen, was defined. One supplementary activity was suggested; it was throwing weighted balls.

All of the revisions in the throwing materials can be found in Appendix G.

Striking. It was suggested that the nature of the striking task in O.S.U. SIGMA, i.e., a suspended ball, was better than the
tossed ball as described in the objectives at each level. Since the tossed ball alters the requirements of the task, the decision was made to use a balloon or ball tied to a string and suspended to waist level.

A question was raised about the positioning of the hands on the bat. In order to get standard performances, the positioning of the hands at levels two, three, and four was clarified by explicating that the hand of the lead shoulder was on the bottom.

At levels one, two, and three there was concern over the indefinite movement of the feet. The action of the feet was clarified by stating that "the feet may move."

Relative to the teaching-learning experiences at all levels, the terms, "strike" and "hit", were eliminated, because they emphasized a secondary competency. In their place, the phrase, "swings at" was substituted.

In level one the fifth experience was eliminated, because it was more difficult than the objective. At level three the evaluators had difficulty interpreting the first and third learning experiences. In an attempt to aid in the interpretation, the position of the body was clarified in each.

With respect to the learning experiences at level four, considerable revision occurred as a result of the evaluation. The first four experiences were changed to represent a simulated swinging activity, while the sub-components of each experience were expanded to include the use of a batting tee.

An additional experience encouraged the use of the same progression but with objects tied to a string and suspended to waist
Kicking. Because of the potential danger resulting from stepping on a ball, the evaluators suggested that it be removed not only from the objective but also from the learning experiences at level one. The decision was made to eliminate this activity.

At level two, the order of the first two learning experiences were reversed because of the difficulty factor. At level three, the fourth learning experience was eliminated, because it was more difficult than the objective.

Considerable revision occurred at level four as a result of the evaluation with respect to the teaching-learning experiences. Two original experiences, two and four, were eliminated, because they utilized a rolling ball which required more skill than the objective.

Two additional experiences, a simulated kicking activity and an activity consisting of kicking and following through onto a footprint, were substituted. Consequently there was considerable reordering in the middle of the progression.

All of the revisions in the kicking materials can be found in Appendix G.

Summary

Subsequent to analyzing the responses from the curriculum evaluators, this investigator and his major advisor revised the curriculum materials based on those responses.
Other changes were made by this investigator and his major advisor that were not suggested by the evaluators; however, in a great many instances the changes were stimulated by their constructive criticism.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

The purpose of this study was to develop an instructional model which would facilitate an individual approach to programming physical education experiences for the pre-school child who is moderately retarded. More specifically, the study attempted to develop a reliable assessment instrument which was developmental in nature and which identified levels of skill performance based on intra-task analysis. Additionally the study attempted to develop a performance-based curriculum which was based on behavioral (performance) objectives and which consisted of concomitant teaching-learning experiences.

The literature is replete with examples of assessment and screening instruments which derive their results from normative data (Meier, 1973; Olion & Rodabaugh, 1974). Two prominent instruments (Bayley, 1969; Gesell & Amatruda, 1974) purport to measure motor development in the same manner. The major difficulty with this approach is that the skill is examined more for its quantitative aspects, i.e., the number of hops, the distance traversed, the distance attained.

Although similar types of data may be significant to other discipline areas, it is of less significance to the area of motor development. What is needed is a process which examines the change in the qualitative aspects of the behavior over time. This places the emphasis on the execution of the skill and not on the performance output.
The literature also contains many examples of curricula which have been developed for special populations. When the authors of these materials have included a section on fundamental motor skills, they have approached their task from the standpoint of utilizing a mature functional skill in a manner that highlights the quantitative aspects of performance (Guide to Physical Education, 1970; Voss, 1971).

Three independent processes were designed which, when completed, would ally and form the model which served as the primary problem of this study. First, development of an assessment instrument which was formulated and designed on an intra-task analysis of eleven, select, motor skills. The first draft of O.S.U. SIGMA was evaluated by eleven professional educators who constructively criticized all aspects of its format. Their evaluation served as the basis for revision.

Secondly, subsequent to revising the instrument, a test-retest reliability study was designed and implemented. Initially, the performances of twelve children, ages two and one half years to fourteen years, were video taped, while they were administered O.S.U. SIGMA. These video tapes were then shown to thirteen judges who observed the performances and made decisions about the level of performance. The reliability study was conducted with one week separating the test-retest observations. The data emanating from the reliability study were analyzed with Scott's Pi which is a statistic for use with nominal data.

Pi coefficients for inter-judge and intra-judge test reliability were reported. Additionally, scorer reliability, i.e., percent agree-
ment, was computed for the test-retest conditions. Walking, catching, ladder and stair climbing had reliability coefficients well within the range of acceptability. Seven skills, running, hopping, throwing, jumping, kicking, striking, and skipping produced reliability coefficients which were lower than conventional standards. Reasons were posited for these reliabilities which included a discussion of general reliability principles and of Scott's Pi specifically.

The final aspect of the study was the development of a performance-based curriculum. The first draft of the curriculum was sent to twenty-four evaluators in three installments at three week intervals. Twenty-two responses were received on the first two mailings and twenty-one responses on the third.

Each mailing contained copies of the curriculum materials for a given number of skills, copies of O.S.U. SIGMA corresponding to those skills, and a Materials Evaluation Form which was comprised of specific questions regarding the behavioral objectives and teaching-learning experiences. The evaluations which were categorically defined as only theoretical, only practical, or a combination of both served as the basis for revision.

CONCLUSIONS

O.S.U. SIGMA

For the purpose of this section, conclusions about O.S.U. SIGMA will combine the two processes, i.e., the development and evaluation and the reliability study, which contributed to its evolution.
Development and Evaluation. With respect to the development and evaluation of O.S.U. SIGMA, the following conclusions seem justified:

1. The delineation of the select motor skills into four performance levels was an arbitrary decision made by this investigator and his major advisor. It has never been suggested nor is it suggested now that four levels are the only way to divide these skills.

2. Because there is a dearth of substantive research on intra-task analysis of gross motor skills, the levels which have been delineated are, at best, tentative.

3. The process of intra-task analysis was not the most difficult part of the development of O.S.U. SIGMA, rather it was writing the description of the skill in observable terms. This will be a continuous revisionary process.

4. Some skills are more difficult to observe than others; for example, running, hopping, jumping, and kicking are problematic because of their dynamic nature. Since these skills occur swiftly while numerous actions are occurring in the arms, legs, and trunk, the description of the behaviors at each level will have to be defined more precisely if these skills are going to be assessed properly, i.e., in the manner suggested in this study.

Reliability Study. The following conclusions are warranted as a result of the reliability study conducted on O.S.U. SIGMA:

1. Seven skills, i.e., running, hopping, jumping, throwing, kicking, striking, and skipping, had test reliability coefficients which would be considered poor by conventional standards. Of the
skills producing the low reliability scores, the four skills which could conceivably contribute their results to less than adequate delineation of the performance levels as defined in O.S.U. SIGMA were: running, hopping, jumping, and kicking.

2. Better techniques are needed when administering the instrument. This would consist of asking the child, for example, to throw the ball as "hard as he can." This type of verbal cue can promote a level of performance that is clearly distinguishable.

3. When attempts are made to observe and rate large numbers of children, e.g., twelve in this study, via video tapes, low test reliability coefficients can be expected. Each night of the test-retest study required a four hour period of time.

4. Practice with the instrument is one way to assure more accurate and reliable estimates of the various levels of performance.

5. Scott's Pi which is the statistical technique for analyzing nominal data appears to have some idiosyncratic shortcomings, i.e., the requirement of a large sample size and the production of negative reliability coefficients. Therefore, at least in terms of this study, Scott's Pi lacks statistical efficiency; consequently, reliability has been diminished. How much is undeterminable.

O.S.U. PBC

With respect to the development and evaluation of O.S.U. PBC, the following conclusions are warranted:

1. An overwhelming majority of evaluators agreed that the behavioral objectives for all skills were sequential, succinct, desirable, and developmentally appropriate.
2. In terms of running and skipping, there was a small minority of evaluators who questioned the developmental appropriateness of the objectives.

3. With respect to the teaching-learning experiences, clarity was the major concern especially in walking, running, throwing, catching, striking, and ladder climbing.

4. Running received the least number of affirmative responses regarding the teaching-learning experiences. It was criticized not only for its progression but also for its lack of potential for attaining the behavioral objectives as well as the lack of sufficient motivational properties.

5. The teaching-learning experiences for ladder climbing were criticized for their lack of potential for attaining the behavioral objectives.

6. Slightly less than half (48.6%) of the evaluators who answered the question regarding the nature of their evaluation used a combination of a theoretical and practical review.

RECOMMENDATIONS FOR FURTHER RESEARCH

The following recommendations may be of assistance in pursuing additional research:

1. Revision of those skills especially running, jumping, hopping, and kicking which had low test reliability should be attempted.

2. Consider using a different number of levels (more or less than four) depending on the nature of the skill, e.g., walking could easily have more than four levels.
3. Some skills are more complex than others. Where possible consider delineating the most important aspect(s) of the skill for classification purposes instead of requiring visual identification of each and every component.

4. In order to better determine the reliability of the various skills in O.S.U. SIGMA, future efforts should consider doing test-retest studies on one or two skills at a time.

5. An attempt should be made over the long term to increase the number of judges making observations and ratings. This should have the effect of increasing the test reliability of O.S.U. SIGMA.

6. To facilitate standardization of the assessment process, thought should be given to the development of a test manual.

7. An effort should be made to develop or to encourage development of a statistic which, unlike Scott's Pi, has more statistical efficiency.

8. With respect to O.S.U. PBC, an extensive field test, i.e., one year or more, should be considered in order to get more and better information on some of the experimental activities suggested as well as on the use of the part method of instruction which is utilized throughout the objectives and teaching-learning experiences.

9. If field tested to any extent, the curriculum materials should probably contain diagrams and drawings to facilitate its use.
APPENDIX A

COVER LETTER, REVIEW GUIDELINES, AND FIRST DRAFT OF O.S.U. SIGMA
Dear

I am currently developing a performance-based curriculum in physical education for pre-school children who are developmentally delayed. This project, which is under the direction of Dr. Walter F. Ersing, is serving as my doctoral dissertation. The curriculum will concentrate on such fundamental gross motor skills as: rolling, crawling, creeping, walking, running, hopping, jumping, skipping, throwing, catching, kicking, and striking. Accompanying the curriculum will be an assessment profile which has been designed on a developmental basis.

Construction of the assessment profile is predicated on a delineation of the aforementioned skills into discernable parts, e.g., the skill of creeping consists of three primary stages, namely, homologous, homolateral, and cross-pattern. It has been and still is my intention to break down each skill into its demonstrable behavioral components. Additionally, I am interested in presenting an instrument which can be used by professional and para-professionals alike; therefore, clarity and simplicity are necessary hallmarks if this instrument is going to have appeal.

With this in mind, I am prevailing upon numerous professionals, like yourself, to examine this most recent revision of the assessment profile. Fully aware that I am asking you to take precious time from your already overburdened schedules, I would request that you critically review the profile and return it by October 9, 1974. I am interested in your comments from a content point of view and not from the standpoint of utilization.

Enclosed please find a copy of The Ohio State University Gross Motor Assessment Profile along with a list of questions you should use in your analysis. Feel free to make notations on the copy of the profile you have received and return it in the stamped, self-addressed envelop. For expending your time and energy in the reviewing process, you will receive a copy of the finalized instrument.
Let me take this opportunity to thank you for assisting me in this most vital aspect of the study. It will be your comments and timely suggestions which will hopefully make this assessment profile a suitable programming instrument for use with children who are developmentally delayed.

Again, thank you for your assistance in this endeavor.

Sincerely,

E. Michael Loovis
Assistant Project Director
Adapted Physical Education
1. Are the test equipment instructions clear?

2. Are the test conditions, which the examiner must monitor, clear and concise for each level? For example, are the environmental controls (test conditions) suitable, or do they need to be elaborated upon?

3. Are the behaviors in each level descriptive enough to clearly delineate a demonstrable part of a given motor skill for that level?

4. Does the language convey what is expected of the child in terms of the overt behavior for each level?
**SKILL OF Walking**

**TEST EQUIPMENT:** Wall, Bench, Rail, etc.

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST CONDITIONS</strong></td>
<td><strong>PERFORMANCE</strong></td>
<td><strong>TEST CONDITIONS</strong></td>
<td><strong>PERFORMANCE</strong></td>
</tr>
</tbody>
</table>
| When from a sitting position, | The child is capable of:  
  a. assuming a standing position either independently or with assistance,  
  b. maintaining an erect standing posture with assistance for a minimum of 10 seconds. | The child demonstrates the following behaviors:  
  a. assumes a standing position either independently or with assistance,  
  b. walks in a sideward direction always leading with the same leg for a distance of 5 feet. | The child demonstrates the following behaviors:  
  a. assumes a standing position either independently or with assistance,  
  b. walks totally unassisted with a gait characterized by arm and leg opposition, i.e., right arm and left leg swing forward together and vice versa, in a straight path for a distance of 15 feet. |
<p>| When from a sitting position and within arms reach of a wall, bench, rail, etc., | Same | | |
| | | | |</p>
<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
</table>
| **TEST CONDITIONS** | The child walks with a rapid pace for at least 5 feet in three trials. | The child attempts to run and demonstrates the following behaviors in three trials:  
- a. holds arms in a slightly bent position with hands at approximately waist level and moves them back and forth partially across the front of his body,  
- b. moves arms in opposition (right arm forward when left leg is forward),  
- c. points knee of swinging leg out (like toeing out),  
- d. runs with one foot support at all times—no total suspension. | The child runs and demonstrates the following behaviors in three trials:  
- a. holds arms in a clearly bent position with hands just below shoulder level and swings them across in front of his body and then back and away just below shoulder level,  
- b. moves arms in opposition to the legs (right arm forward when left leg is forward),  
- c. swings leg backwards across mid-line of body before moving leg forward (NOTE: trunk may twist back and forth to assist in crossing the mid-line during the backward swing of leg),  
- d. runs with total non-support—both feet off the floor together. | The child runs and demonstrates the following behaviors in three trials:  
- a. moves arms, held at approximately right angles, in opposition to the legs (right arm forward when left leg is forward with large movements forward and backward),  
- b. swings leg forward causing the heel to pass close to the buttock; the knee is raised to approximately waist level,  
- c. places foot of swinging leg on the floor in a nearly flat manner and in a straight line,  
- d. runs with total non-support—both feet off the floor together. |
| **PERFORMANCE** | Same | Same | Same |
| NOTE: This behavior is best observed from behind. | NOTE: This behavior is best observed from the side. |
**TEST EQUIPMENT:** None

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONDITIONS</strong></td>
<td><strong>CONDITIONS</strong></td>
<td><strong>LEVEL III</strong></td>
<td><strong>LEVEL IV</strong></td>
</tr>
<tr>
<td>When in a standing position with the feet parallel and next to each other,</td>
<td>When in a standing position supported on one leg with the other foot held just a few inches above the floor,</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>The child, using a simultaneous two-foot take off and landing, jumps at least two consecutive times in any one of three trials, either straight up and down or forward in a broad jump fashion.</td>
<td>The child attempts to hop and demonstrates the following behaviors in three trials:</td>
<td>The child attempts to hop and demonstrates the following behaviors in three trials:</td>
<td>The child hops by coordinating the following behaviors simultaneously in three trials:</td>
</tr>
<tr>
<td>a. raises both arms sideways, usually to chest level (NOTE: arm on side of non-support leg may be straight; arm on side of support leg may be bent), b. raises non-support leg as high as possible simultaneously with arm movement, c. does not actually move support foot from floor.</td>
<td>a. holds both arms bent at elbows sideways at approximately shoulder level, b. holds bent non-support leg off the floor with knee at approximately waist level, c. lifts foot of support leg off the floor and quickly returns it.</td>
<td>a. swings arms upward to aid in lifting body off the floor, b. lifts the bent non-support leg upward simultaneously with arm swining, c. straightens support leg to lift body off the floor.</td>
<td></td>
</tr>
</tbody>
</table>
**SKILL OF **

**Throwing**

**TEST EQUIPMENT: 6" Playground Ball and Tennis Ball**

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing in front of and five feet from the catcher.</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

The child throws the 6" ball in the direction of the catcher and demonstrates the following behaviors in three trials:

a. Uses either a two-handed push or throw with both arms in unison or a single-handed throw with the arm swinging in an overhand (chopping) motion.
b. Little or no shift in body weight.
c. No movement of feet.

The child throws the tennis ball in the direction of the catcher and demonstrates the following behaviors in three trials:

a. Uses a single-handed throw with the arm swinging in a sidearm (right to left or vice versa) motion, and arc of swing is downward.
b. Twists body to side of throwing arm during backswing then forward to side opposite throwing arm during throw.
c. No movement of feet.

d. Steps with leg on same side as throwing arm.

The child throws the tennis ball in the direction of the catcher and demonstrates the following behaviors in three trials:

a. Uses a single-handed throw with the arm swinging in a sidearm (right to left or vice versa) motion, and arc of swing is downward.
b. Twists body to side of throwing arm during backswing then forward to side opposite throwing arm during throw.
c. Steps with leg on same side as throwing arm.
**TEST EQUIPMENT:** 6" Playground Ball

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST CONDITIONS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing in front of and five feet from the thrower,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>
| The child attempts to catch the ball in three trials by extending his outstretched arms in a stiff manner in front of his body causing the ball to rebound off the arms. | The child, using the hands and arms (bent at the elbows) to scoop or bring the ball into the body, catches the ball at least once in three trials. | The child catches at least one out of three throws and demonstrates the following behaviors:
  a. holds arms bent at the elbows in front of the body,
  b. uses hands in opposition to one another like the jaws of a vice. | The child catches at least one out of three throws and demonstrates the following behaviors:
  a. holds arms bent at the elbows at the sides of body,
  b. uses hands in a cupped fashion such that on throws above the waist the thumbs are nearly touching and on throws below the waist the little fingers are close together. |

**PERFORMANCE**


### Test Equipment: Step 8", Piece of Paper 8"-11"

<table>
<thead>
<tr>
<th>Skill of Jumping (Broad J.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Conditions</strong></td>
</tr>
<tr>
<td><strong>Level I</strong></td>
</tr>
<tr>
<td>When in a standing position on the edge of an object or step approximately 8&quot; high,</td>
</tr>
<tr>
<td>The child demonstrates one of the following behaviors in three trials:</td>
</tr>
<tr>
<td>a. steps down by moving one foot at a time,</td>
</tr>
<tr>
<td>b. leaps down leaving body momentarily suspended,</td>
</tr>
<tr>
<td>c. jumps with both feet simultaneously (NOTE: if child can do this, administer Level 2 test),</td>
</tr>
</tbody>
</table>

### Test Conditions

- When in a standing position on the edge of an object or step approximately 8" high, the child demonstrates one of the following behaviors in three trials:
  - a. steps down by moving one foot at a time.
  - b. leaps down leaving body momentarily suspended.
  - c. jumps with both feet simultaneously (NOTE: if child can do this, administer Level 2 test).

- The child jumps the width (8") of the paper and demonstrates the following behaviors in three trials:
  - a. uses two-foot take off which looks more like a two foot hop.
  - b. maintains arms at the sides in a bent manner during the jump.

- The child jumps the length (11") of the paper and demonstrates the following behaviors in three trials:
  - a. uses two-foot take off and landing.
  - b. swings arms overhead during push-off of jump.
  - c. drops arms to a position in front of body in landing to assist with balance.
### Skill of Kicking

#### TEST EQUIPMENT: 6" Playground Ball

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position and placed in front of but not more than 2' away from a ball approximately 6&quot; in diameter.</td>
<td>Same</td>
<td>When in a standing position and placed in front of but not more than 5' away from a ball approximately 6&quot; in diameter.</td>
<td>Same</td>
</tr>
<tr>
<td>The child, at least once in three trials, walks up to the ball, makes contact with a stiff-leg and continues with the walking pattern. Kick appears as part of walking pattern and shows no attempt to swing the kicking leg.</td>
<td>The child kicks the ball in direction of the examiner and demonstrates the following behaviors in three trials: a. uses a stiff-leg swinging primarily from the hip with little or no bending of the knee, b. moves the arms and trunk only slightly, if at all. Is child's first attempt to swing leg when kicking.</td>
<td>The child kicks the ball in direction of the examiner and demonstrates the following behaviors in three trials: a. swings the bent kicking leg backwards and forward with a simultaneous straightening of the leg, b. holds arm opposite from kicking leg out to the side approximately shoulder level, c. returns kicking leg to a position next to the support leg after executing kick.</td>
<td>The child kicks the ball in direction of the examiner and demonstrates the following behaviors in three trials: a. swings the bent kicking leg backwards and forward with a simultaneous straightening of the leg, b. uses both arms held out to the sides of body to maintain balance, c. leans slightly backwards as kick is performed, d. maintains balance on non-kicking leg during kicking action and follow through, e. steps forward onto kicking leg only after kicking action and follow through are completed.</td>
</tr>
<tr>
<td>LEVEL I</td>
<td>LEVEL II</td>
<td>LEVEL III</td>
<td>LEVEL IV</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>When in a standing position, holding a plastic bat approx. 24&quot; long, and facing a ball 6&quot; in diameter suspended by a string at shoulder level,</td>
<td>Same</td>
<td>When in a standing position, holding a plastic bat approx. 24&quot; long, and facing a ball 6&quot; in diameter suspended by a string at waist level,</td>
<td>Same</td>
</tr>
</tbody>
</table>
| The child strikes the ball at least once in three trials and demonstrates the following behaviors:  
  a. uses only one arm, the bat being positioned on or near the shoulder,  
  b. swings in an overhand (chopping) motion,  
  c. steps with the leg on the same side as the striking hand, | The child strikes the ball at least once in three trials and demonstrates the following behaviors:  
  a. uses both arms, the bat being positioned in front of and adjacent to the shoulder,  
  b. swings in a sidearm motion (right to left or vice versa) but arc of swing is flat (horizontal) or slightly upward,  
  c. shifts body weight in direction of swing (this is a rocking motion; it is not a step), | The child strikes the ball at least once in three trials and demonstrates the following behaviors:  
  a. uses both arms, the bat being positioned in front of and adjacent to the shoulder,  
  b. swings in a sidearm motion (right to left or vice versa) but arc of swing is flat (horizontal) or slightly upward,  
  c. shifts body weight in direction of swing (this is a rocking motion; it is not a step), | The child strikes the ball at least once in three trials and demonstrates the following behaviors:  
  a. uses both arms, the bat being positioned in front of and adjacent to the shoulder,  
  b. swings in a sidearm motion (right to left or vice versa) but arc of swing is flat (horizontal) or slightly upward,  
  c. shifts body weight in direction of swing (this is a rocking motion; it is not a step), |

STRIKING
**O.S.U. SIGMA**

**TEST EQUIPMENT:** None

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST</strong></td>
<td><strong>CONTINUOUS</strong></td>
<td><strong>PERFORMANCE</strong></td>
<td><strong>PERFORMANCE</strong></td>
</tr>
<tr>
<td>When in a standing position and with the examiner approximately 25 feet in front of him,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>The child cannot skip but will likely demonstrate any of the following behaviors in three trials: running, galloping, hopping or leaping,</td>
<td>The child attempts to skip while doing a normal walking or running pattern and demonstrates the following behaviors in three trials: a. performs skip more often than not on the same leg though not necessarily consecutively, b. holds arms either down at sides or slightly bent with hands at approximately waist level.</td>
<td>The child skips and demonstrates the following behaviors in three trials: a. alternates feet, b. does not use arms in opposition, if at all, c. does skipping pattern slowly, and it appears segmented (the child may walk, or run for brief periods).</td>
<td>The child skips and demonstrates the following behaviors in three trials: a. alternates foot, b. uses arms in opposition (right arm forward when left leg is forward), c. executes skip with ease and good coordination,</td>
</tr>
</tbody>
</table>
### Skill of Ladder Climbing

**Test Equipment:** Ladder

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Conditions</strong></td>
<td><strong>Performance</strong></td>
<td><strong>Performance</strong></td>
<td><strong>Performance</strong></td>
</tr>
<tr>
<td>When standing in front of and touching a ladder,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>The child, using any method at all, climbs up and down one step in three trials.</td>
<td>The child, using a homologous pattern, i.e., one hand followed by the other hand and one leg followed by the other leg, climbs up and down two or more steps in three trials.</td>
<td>The child, using a homolateral pattern, i.e., right arm and right leg followed by the left arm and left leg, climbs up and down two or more steps in three trials.</td>
<td>The child, using a cross-pattern, i.e., right arm and left leg followed by the left arm and right leg and vice versa, climbs up and down two or more steps in three trials.</td>
</tr>
</tbody>
</table>
**O.S.U. SIGMA**

**SKILL OF Stair Climbing**

**TEST EQUIPMENT: Series of Steps**

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When standing at the bottom of a series of steps,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

**NOTE:** Examiner cannot serve as an aid in place of railing or wall.

The child creeps up and down 5 steps or creeps up the steps and slides down from step to step on the buttock in three trials.

The child, with or without the aid of the railing or wall, walks up and down 5 steps and demonstrates the following behaviors in three trials:

1. walks up using a two foot landing with the dominant foot leading,
2. walks down either in the same manner or by sliding from step to step on the buttock.

The child, with or without the aid of the railing or wall, walks up and down 5 steps and demonstrates the following behaviors in three trials:

1. walks up using an alternate stepping pattern,
2. walks down either in the same manner or by using a two-foot landing with the dominant foot leading.

The child, using an alternate stepping pattern, walks up and down 5 steps totally unassisted in three trials.
APPENDIX B

JUDGES SCORING SHEET FOR O.S.U. SIGMA
RELIABILITY STUDY
<table>
<thead>
<tr>
<th>Skills</th>
<th>Assessment Level: (level to be that as observed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td></td>
</tr>
<tr>
<td>Running</td>
<td></td>
</tr>
<tr>
<td>Hopping</td>
<td></td>
</tr>
<tr>
<td>Throwing</td>
<td></td>
</tr>
<tr>
<td>Catching</td>
<td></td>
</tr>
<tr>
<td>Jumping</td>
<td></td>
</tr>
<tr>
<td>Kicking</td>
<td></td>
</tr>
<tr>
<td>Striking</td>
<td></td>
</tr>
<tr>
<td>Skipping</td>
<td></td>
</tr>
<tr>
<td>Climbing</td>
<td></td>
</tr>
<tr>
<td>Stair Climbing</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

COVER LETTER, ADDENDUM, MATERIALS EVALUATION FORM, AND FIRST SET OF CURRICULUM MATERIALS WITH CORRESPONDING REVISED O.S.U. SIGMA
Dear 

I am currently developing a performance-based, diagnostic curriculum in physical education for pre-school children who are developmentally delayed. This project, which is under the direction of Dr. Walter F. Ersing, is serving as my doctoral dissertation. The curriculum will concentrate on such fundamental, ontogenetic skills as: walking, running, hopping, jumping, throwing, catching, kicking, striking, skipping, ladder climbing, and stair climbing.

Development of the curriculum package, which has as its purpose the promotion of skill acquisition to either a higher level of performance or the most mature level, is based on the delineation of each skill into four levels, i.e., the O.S.U. Scale of Intra-Gross Motor Analysis (subsequently to be referred to as the O.S.U. SIGMA.) As with the assessing instrument, I am interested in presenting materials which can be used by professionals and para-professionals alike; therefore, clarity and simplicity are necessary hallmarks if implementation of the curriculum is to be achieved.

With this in mind, I am prevailing upon numerous professionals, like yourself, to examine the initial attempt at producing curriculum experiences to facilitate development of the fundamental motor skills alluded to previously. Fully aware that I am asking you to take precious time away from your already overburdened schedules, I would request that you critically review the curriculum and return it to me by April 21, 1975.

Enclosed are copies of the performance-based, teaching-learning experiences for the first four skills of the curriculum. Attached to each skill is a Materials Evaluation Form which should be completed after reviewing and/or implementing the materials for that skill. The Materials Evaluation Form, along with your written comments on the skill sheets, will serve as your method of providing feedback relative to the merits and shortcomings of the curriculum.

I have also enclosed a copy of the O.S.U. SIGMA corresponding to the skill materials being reviewed. This follows the Materials Evaluation Form and is merely designed to acquaint you with the assessment tool for which the curriculum has been generated.

I am interested in your comments from a content point of view, i.e., what you know about the development of these skills and their concomitant progressions from a theoretical perspective, and from the standpoint of utilization, i.e., what you, the practitioner, know about...
the implementations of certain activities, etc, within the teaching environment. You are strongly encouraged to implement all or a part(s) of the curriculum in order to get a feel for what I have attempted to do and to be in a position to more objectively evaluate whether or not I have succeeded in attaining the stated goal of the study.

This is the first of three sets of curriculum experiences you will receive. In order that I might retain the projected mailing schedule, I would appreciate having the completed Materials Evaluation Form and Curriculum Materials on each skill returned by the April 21st deadline. For your convenience, I have enclosed a stamped, self-addressed envelop. For expending your time and energy in the evaluation process, you will receive a copy of the revised curriculum.

Let me take this opportunity to thank you ahead of time for assisting me in this most vital aspect of the study. It will be your honest comments and suggestions which will hopefully make this curriculum a suitable programming aid for use with pre-school children who are developmentally delayed.

Again, thank you for your assistance in this endeavor.

Sincerely,

E. Michael Loovis
Assistant Project Director
Adapted Physical Education
There is built into this curriculum a mechanism for determining and classifying the extent of teacher involvement in the actual performance of a teaching-learning experience. There are three such levels of teacher involvement, namely, dependent, assistive, and independent.

The dependent role requires total teacher involvement in the task conceivably bordering on manipulation or patterning; the assistive role means that the child needs some help in completing the task, while the independent role indicates that the child is performing the task totally unassisted. Unless otherwise stated, you should conceptualize the use of all of these techniques to facilitate successful completion of a teaching-learning experience and ultimately the specific behavioral objective.
SKILL: ____________________________

Part I. Behavioral Objectives

1. Are they sequential? ................. Yes No
   If no, indicate which objective(s) you would
   re-order, eliminate, etc._____________________

2. Are they written clearly and succinct? ....... Yes No
   If no, indicate which objective(s) is not ______
   and why _______________________________________

3. Are the objectives specified in accountable terms? Yes No
   If no, indicate which objective(s) is not ______

4. Are the objectives appropriate (desirable)? ...... Yes No
   If no, indicate which objective(s) is not ______

5. Are the objectives developmental? ............ Yes No
   If no, indicate which objective(s) is not ______

6. Are there additional objectives which you use or
   which you would suggest that we use? If so,
   please give a concise description of the objec-
   tive in the space provided below.
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

Part II. Formative Evaluation of Teaching-Learning
         Experiences (including Supplementary
         Activities)

1. Are they sequential? ................. Yes No
   If no, indicate which teaching-learning experi-
   ences you would re-order, eliminate, etc._____

2. Are they written clearly and succinct? ....... Yes No
   If no, indicate which teaching-learning experi-
   ence(s) is not _______________________________
   and why ______________________________________
3. Do the teaching-learning experiences appear to have potential for attaining the behavioral objective sought for the child? ...... Yes ...... No If no, indicate which teaching-learning experience(s) does not ___________ and why ___________

4. Do the teaching-learning experiences appear to have sufficient motivational properties for a teacher so that they are likely to be used? ... Yes ...... No If no, indicate which teaching-learning experience(s) does not ___________ and why ___________

5. Are there additional teaching-learning experiences which you use or which you would suggest that we use? If so, please give a concise description of the teaching-learning experiences in the space provided below.

Part III. Nature of Evaluation

1. Your evaluation of this skill has been based on the following: (Please check where applicable)

   _____ Both a theoretical review and a practical implementation

   _____ Only a theoretical review

   _____ Only a practical implementation

Name of person completing evaluation: ________________________________
### SKILL OF Walking

**TEST EQUIPMENT:** Wall, Bench, Rail in a stationary position  
**NOTE:** Examiner cannot be used!

<table>
<thead>
<tr>
<th>LEVEL I</th>
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<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions</td>
<td>Test Conditions</td>
<td>Test Conditions</td>
<td>Test Conditions</td>
</tr>
<tr>
<td>When assisted from an all 1/2's position by the examiner,</td>
<td>When from an all 1/2's position and within arm's reach of a wall, bench, rail, etc.,</td>
<td>Same</td>
<td>When from an all 1/2's position,</td>
</tr>
</tbody>
</table>
| The child is capable of maintaining an erect standing posture either assisted, unassisted, or a combination of both for a minimum of ten seconds in two out of three trials, | The child demonstrates the following behaviors in two out of three trials:  
  a. assumes a standing position either with assistance from support objects or independently,  
  b. walks sideways always leading with the same leg for a distance of approximately five feet but maintains continuous contact with object, | The child demonstrates the following behaviors in two out of three trials:  
  a. assumes a standing position independently,  
  b. walks forward at least ten steps with arms raised to approximately shoulder level and feet spread wide,  
  c. touches support object once. | The child demonstrates the following behaviors in two out of three trials:  
  a. assumes a standing position independently,  
  b. walks forward totally unassisted with a gait characterized by arm and leg opposition, i.e., right arm and left leg swing forward together and vice versa, in a straight path for a distance of fifteen feet, |

**Performance**  
McGraw, 1940  
Breckenridge and Murphy, 1969  
Gesell and Amatruda, 1974  
Shirley, 1933  
Angle, 1972  
Bayley, 1935  
Shirley, 1933  
Burnett and Johnson, 1971  
Moore, 1940  
Gesell, 1940  
Shirley, 1933
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: WALKING

LEVEL: ONE

Behavioral Objective: #1

To pull to an upright kneeling position from sitting back on legs--When sitting back on his legs, hands on the floor in front of him and within reach of either the instructor or a chair, the child will pull himself to an upright kneeling position on every occasion. (Instructor may assist by taking child's hands, but should not help by pulling him up.)

Teaching - Learning Experiences:

1. Place child in an all 4's position and with your hands on his hips bring him to sitting back on his legs. (Caution: Check to be sure that his feet are turned inward rather than outward.) From this position bring him to an upright kneeling position.

2. Place child over a large bolster or rolled mat. Guide him into kneeling with your hands on his legs (hands are placed at or slightly below the knee joint) as you pull him back towards the floor.

3. While in the sitting position and then in the semi-kneeling or sitting back on the legs position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.

* Push forward and backward also.

4. Place child in an all 4's position with a chair in front of him. Encourage child to sit back on legs and then pull up on the rungs of the chair until a kneeling position is achieved.

Behavioral Objective: #2

To raise trunk to an upright kneeling position from all 4's--When in an all 4's position and within reach of either the instructor or a chair, the child will pull his trunk to an upright kneeling position two out of three times. (Instructor may assist by taking child's hands.)

Teaching - Learning Experiences:

1. Place child in such a position that he is sitting back on his legs, hands on the floor in front of him. From this position have him pull himself to an upright kneeling position.

2. While in the upright kneeling position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.

* Push forward and backward also.

a. Initially, child holds onto a chair
b. Child holds onto a wand/stick instead of chair
c. Child is able to balance without assistance.
Behavioral Objective: #3

To pull to standing from half-kneeling -- when in a full kneeling position in front of a bench, rail, etc., the child will bring one leg forward into a half-kneeling position and from there pull up to standing two out of three times.

Teaching - Learning Experiences:

1. Place child in kneeling position in front of a chair, bench, etc. Take one of his thighs in your hand and lift one leg to place child in a half-kneeling position. Push in on his buttocks firmly and gently lift him to a standing position.

2. While in the half-kneeling position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.

   - Push forward and backward also.
   - a. Initially, child holds onto a chair.
   - b. Child holds onto a wand/stick instead of chair.
   - c. Child is able to balance without assistance.

3. To return to half-kneeling from standing, take hold of the child's leg and gently bending his leg bring him back to a half-kneeling position. (Note: Take a position behind the child and be ready to use the shoulder or body to provide stability for the child while he is being guided back to half-kneeling.)

Behavioral Objective: #4

To maintain erect standing posture for 10 seconds -- After having pulled to a standing position, the child will maintain an erect standing posture either assisted, unassisted or a combination of both for a minimum of 10 seconds two out of three times.

Teaching - Learning Experiences:

1. Have the child standing and leaning with his back against a wall for increasingly longer periods of time up to 10 seconds.

2. Have the child standing and holding onto a rail, bench, etc. at waist level and have him maintain his balance for increasingly longer periods of time up to 10 seconds.

3. Have the child standing and holding onto either someone's hands or a stick/rope with both hands and have him maintain his balance for increasingly longer periods of time up to 10 seconds.
Teaching - Learning Experiences: B.O. #4

4. Have the child standing and holding onto either someone's hand or a stick/rope with one hand, and have him maintain his balance for increasingly longer periods of time up to 10 seconds.

5. Have the child standing and within arms reach of a wall, rail, bench, etc., and have him maintain his balance with only periodic assistance from support objects for increasingly longer periods of time up to 10 seconds.
ACTIVITY: WALKING

LEVEL: TWO

Behavioral Objective:

To cruise or walk sideways always leading with the same leg for a distance of five feet — when standing at one end of a bench, rail, etc., along which he can move while holding on, the child will cruise or walk sideways always leading with the same leg for a distance of at least 5 feet on every occasion.

Teaching - Learning Experiences:

1. Child pulls his trunk to an upright kneeling position from all 4's position.

2. Child pulls to standing from half-kneeling position.

3. Child maintains erect standing posture for 15-30-45, etc. seconds.

4. Place child at the end of a bench, rail, etc. with your hands on his hips for support. Guide him in a sideways movement along the edge while he holds onto it with his hands. Do not permit him to cross his legs or to rotate his body so that he is walking forward.

5. Child cruises while holding onto a rod which the instructor is holding.

   *Instructor is causing the movement to occur.

6. Child is encouraged to cruise from one support surface to another, thereby, developing independent standing and stepping.
ACTIVITY: WALKING

LEVEL: THREE

Behavioral Objective: #1

To assume a standing position independently -- When in a half-kneeling position, the child independently assumes a standing position two out of three times.

Teaching - Learning Experiences:

1. Place child in an upright kneeling position and have him push a chair, cart, box, etc. across the room.

Behavioral Objective: #2

To walk forward at least 10 steps with arms raised to approximately shoulder level, feet spread wide apart and partially supported -- After assuming a standing position independently, the child walks forward with arms raised to approximately shoulder level and feet spread wide apart for a least ten (10) steps; except for touching a support object once, the performance is independent.

Teaching - Learning Experiences:


2. Start the child cruising and encourage him to take a few steps away from whatever he is holding onto. This can be done by offering him your hand and helping him to take steps holding on with only one hand.

3. Holding the child at the hips from behind, guide him in a walking pattern.

4. Child walks and pushes a chair, cart, box, etc. across the room.

5. Child walks between parallel bars and uses both arms for support.

6. Child walks with one hand on a stationary rail (one of the parallel bars) and the other hand on a dowel/rope, etc.

7. Child walks holding onto one rail, dowel/rope, etc.

8. Child walks with only periodic touches of support objects like the wall, rail, bench, etc.

9. Place child with his back against the wall and encourage him to take a few steps toward you.
ACTIVITY: WALKING

LEVEL: FOUR

Behavioral Objective: "1

To walk forward totally unassisted for at least 15 feet with arms alternating in opposition to legs -- After assuming a standing position independently, the child walks forward totally unassisted with the arms alternating in opposition to legs, i.e., right arm and left leg, forward together and vice versa, in a straight line for a distance of fifteen (15) feet two out of three times.

Teaching - Learning Experiences:

1. Child walks forward totally unassisted with arms raised to approximately shoulder level and feet spread wide for a steadily increasing number of steps, e.g., 12-16-20.

2. Child either creeps on all fours or walks on his hands and feet, like Bear Walking.

*Either movement is done in a cross-pattern, i.e., right leg and left arm move forward at the same time and vice versa.

3. With the instructor holding a stick, dowel or wand in each hand and facing the child who is also holding onto the objects, the child walks and the instructor pulls the stick opposite the stepping foot thereby causing the child to alternate arms in opposition to the legs.

4. Place like colored ribbons, etc. on the opposite foot and arm. Have child match colors, e.g., red ribbon on right arm and left leg would be forward simultaneously.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY NATURES WALK

1. Walk around objects.

2. Walk sideways and then backwards.

3. Vary width of paths and/or have them change directions, e.g., follows a 10' path with 90 degree turns.
   a. Walks straddling a line which changes direction.

4. Walks patterns on the floor, e.g., footprints, squares, etc.

5. Walks with various arm and body positions, e.g., animal walks like dog, bear, etc.

6. Walks balancing various objects, e.g., bean bag on head, wand held vertically in hand.

7. Walks up and down inclines.

8. Walks on walking board, balance beam.

9. Walks using giant steps and then baby steps.

10. Walks using high steps and then low steps.

11. Uses feet in different ways, such as: tiptoes, toes in, toes out, on heels, etc.

12. Walks to rhythmic accompaniment, i.e., rhythm instruments and/or records.
   a. Stand and mark drum beats with feet.
   b. Walk to the drum beat.
   c. Walk on tiptoes with records.
### SKILL OF Running

#### TEST EQUIPMENT: None

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position and with the examiner approximately twenty-five feet in front of him,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td><strong>TEST CONDITIONS</strong></td>
<td></td>
<td><strong>NOTE:</strong> This behavior is best observed from behind.</td>
<td><strong>NOTE:</strong> This behavior is best observed from the side.</td>
</tr>
</tbody>
</table>
| The child walks with a rapid or increased pace for at least five feet in two out of three trials. Characteristics of this behavior are quick up and down movements of the knees. | The child attempts to run and demonstrates the following behaviors in two out of three trials:  
  a. holds arms in a slightly bent position with hands at approximately waist level and moves them back and forth partially across the front of his body,  
  b. moves arms in opposition (right arm forward when left leg is forward),  
  c. swings knee outward when bringing leg forward to give appearance of toeing out,  
  d. requires a broad base of support when running, i.e., feet appear to land outside of hips. | The child runs and demonstrates the following behaviors in two out of three trials:  
  a. holds arms in a clearly bent position with hands just below shoulder level and swings them across in front of his body and then back and away just below shoulder level,  
  b. moves arms in opposition to the legs (right arm forward when left leg is forward) with large movements forward and backward along side of body,  
  c. swings leg forward causing the heel to pass close to the buttock; the knee is raised to approximately waist level,  
  d. swings forward leg well ahead of body before foot lands on the floor,  
  e. runs with total non-support—both feet off the floor together. | The child runs and demonstrates the following behaviors in two out of three trials:  
  a. moves arms, held at approximately right angles, in opposition to the legs (right arm forward when left leg is forward) with large movements forward and backward along side of body,  
  b. moves legs forward causing the heel to pass close to the buttock; the knee is raised to approximately waist level,  
  c. swings forward leg well ahead of body before foot lands on the floor,  
  d. places foot of forward swinging leg on the floor in a nearly flat manner and in a straight line,  
  e. runs with total non-support—both feet off the floor together. |
| Espenscheid, 1967                                                      |          |                                                                           |                                                                          |
| Halverson (Personal Interview), 1975                                  |          |                                                                           |                                                                          |
ACTIVITY: Running

LEVEL: I

Behavioral Objective: #1

To increase walking speed for a distance of 20 feet -- The child will walk independently with a pace that exceeds his normal walking speed for a distance of 20 feet two out of three times.

Teaching - Learning Experiences:

1. Instructor faces child and grasps both of his hands; instructor then walks quickly backwards and guides child into a fast walking pace which exceeds his normal walking speed.

2. Instructor grasps one of child's hands and guides him into a fast walking pace which exceeds his normal walking speed.
   a. Child holds onto a rope, wand, etc. and is guided by instructor into a fast walking pace.

3. Instructor standing behind the child and holding onto his shirt at the shoulders guides him into a fast walking pace which exceeds his normal walking speed.
   Note: Another technique to facilitate running is the wrapping of a towel or rope under the arms and gathering it behind the head; this then becomes the mechanism for guiding the child.

4. Child imitates instructor who walks with a pace that exceeds his normal walking speed.

5. Instructor and child play flag tag at a fast walking pace.
   Note: Strips of cloth tucked in the pants or belt can act as flags.
Behavioral Objective: #1

To develop alternate arm action -- While standing still, the child independently moves the arms, held at approximately right angles and swinging with large movements forward and backward along side the body, in opposition three out of five times.

Teaching - Learning Experiences:

1. Instructor stands behind child and physically alternates arms.

2. Instructor stands behind child who is holding a wand/stick in each hand. The instructor who is also holding the wand/stick pushes in an alternating fashion thereby facilitating opposition.

Behavioral Objective: #2

To develop a narrow base of support -- The child will walk independently with a fast walking pace as if attempting to run and will stay within the boundaries of a path 20 feet long and only 16 inches wide while moving the arms, held at approximately right angles and swinging with large movements forward and backward along side of body two out of three times.

Teaching - Learning Experiences:

1. Use footprints, etc. to narrow the base of support, i.e., feet begin to fall closer and closer together as well as to lengthen the stride.

Behavioral Objective: #3

To imitate a slow run or jog -- The child independently attempts to run by changing from a fast walking pace into a slow run or jog for a distance of 20 feet two out of three times.

Teaching - Learning Experiences:

1. Instructor standing behind the child and holding onto his shirt at the shoulders guides him into a fast walking pace which exceeds his normal walking speed.

   Note: Another technique to facilitate running is the wrapping of a towel or rope under the arms and gathering it behind the head; this then becomes the mechanism for guiding the child.

2. Child imitates instructor who walks with a pace that exceeds his normal walking speed.

3. Instructor and child play flag tag at a fast walking pace.

   Note: Strips of cloth tucked in the pants or belt can act as flags.
Behavioral Objective: #1

To move arms and legs in opposition -- While running a distance of approximately 20 feet, the child independently moves the arms, held at approximately right angles and swinging with large movements forward and backward along side of body, in opposition to the legs four out of five times.

Teaching - Learning Experiences:

1. Instructor stands behind child and physically alternates arms.

2. Instructor stands behind child who is holding a wand/stick in each hand. The instructor who is also holding the wand/stick pushes in an alternating fashion thereby facilitating opposition.

Behavioral Objective: #2

To maintain knee of swinging leg under body -- While running a distance of approximately 20 feet, the child independently moves the knee of the forward swinging leg under the hips two out of three times.

Teaching - Learning Experiences:

1. Child imitates the pedalling of a bicycle while lying on his back.  
   Note: Passively move legs through movement then let child perform independently.
   a. Perform to music.

2. Child imitates instructor who performs running movement very slowly -- knee of swinging leg passes under the hips (body).  
   Note: Instructor can physically prevent knee from swinging out to side of body.

Behavioral Objective: #3

To leap two consecutive steps -- The child independently leaps two consecutive steps, using both feet as take off and landing feet, two out of three times without falling.

Teaching - Learning Experiences:

1. Child jumps down from one foot to both feet from a height of approximately 8 inches without falling.  
   Note: There is a period of total non-support.
Teaching - Learning Experiences: B.O. #3

2. Child jumps from one foot to both feet from a height of approximately 8 inches into a hoop which is placed at the previous point of landing and is steadily moved away (inches at a time).

3. Child leaps one step with either foot as the take off and landing foot.
ACTIVITY: RUNNING

LEVEL: IV

Behavioral Objective: 1

To leap 3 or more consecutive steps -- The child independently leaps 3 or more consecutive steps, using both feet as take off and landing feet, two out of three times.

Teaching - Learning Experiences:

1. Child leaps into and out of hoops, tires, boxes, etc.
   Note: These can be arranged in any design and using any number, e.g., a straight line of 3 tires or a circle of 10 hoops.

Behavioral Objective: 2

To demonstrate a mature run for approximately 23 feet -- While running a straight course of approximately 23 feet, the child independently demonstrates: arm and leg opposition, movement of heel of forward swinging leg close to buttock with associated elevation of thigh to approximately waist level, and an observable period of total non-support, on every occasion.

Teaching - Learning Experiences:

1. Run with tiny, fast steps.
2. Run with giant strides.
3. Run with high knee action.
4. Run over objects, e.g., wands/sticks laid across the intended path and spread far enough apart to conform to the child's running stride.
1. Run around objects, e.g., in and out of markers.
2. Run varying speeds.
3. Run backwards.
4. Run as lightly as possible.
5. Run bouncing as high as you can.
6. Mix in giant steps with your run.
7. Run with a high stepping movement, i.e., high knee action.
8. Run with exaggerated arm movements, i.e., larger than normal arm swings.
9. Stop change direction and/or speed in response to an outside signal.
10. Run on tiptoes, heels, etc.
11. Run forward $\frac{1}{2}$ way and backward the rest.
   a. Run backward $\frac{1}{2}$ way and then forward.
12. Run across the room, turn around (right) completely and continue across.
   a. Same but turn left.
13. Run to rhythmic accompaniment, i.e., rhythm instruments and/or records:
   a. Run in place to drum beat.
   b. Run to drum beat.
   c. Run on tiptoes to record.
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>TEST</strong></td>
<td><strong>LEVEL I</strong></td>
<td><strong>LEVEL II</strong></td>
<td><strong>LEVEL III</strong></td>
</tr>
<tr>
<td><strong>When standing in front of and touching a ladder,</strong></td>
<td><strong>SAME</strong></td>
<td><strong>SAME</strong></td>
<td><strong>SAME</strong></td>
</tr>
<tr>
<td><strong>The child, using any method at all, climbs up and down three to five steps and demonstrates the following behaviors in two out of three trials:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. climbs up using a two foot landing,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. climbs down in the same manner.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley, 1935</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gutteridge, 1939</td>
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<tr>
<td>McCaskill and Wellman, 1938</td>
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<tr>
<td>Wellman, 1937</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Bayley, 1935
Gutteridge, 1939
McCaskill and Wellman, 1938
Wellman, 1937
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: LADDER CLIMBING

LEVEL I

Behavioral Objective: #1

To climb up and down one step -- when standing in front of and touching a ladder, the child, using any method at all, independently climbs up and down one step two out of three times.

Teaching - Learning Experiences:

1. Child climbs onto a mat which is at waist level.

2. Child climbs out of a stack of tires, corresponding to a height which equals the child's shoulder level.

3. Child climbs on and off an adult size chair.

4. Child steps up on a 12" mat with instructor holding both hands.

5. Child steps backwards off a bench approximately 12" high with instructor holding both hands.

6. Child steps on and off a balance beam approximately 8" - 12" high from the side with instructor holding both hands.
ACTIVITY: LADDER CLIMBING

LEVEL: II

Behavioral Objective: #1

To climb up and down two or more steps using a two foot landing -- when standing in front of and touching a ladder, the child, using a two foot landing with the dominant foot leading, climbs up two or more steps two out of three times.

Teaching - Learning Experiences:

1. Child climbs up and backs down an inclined board while in the hands and feet position.

2. Child walks forward and backward in the hands and feet position on a bench approximately 12" wide.

3. Child walks the side rails of a ladder, which is lying flat on the floor, in the hands and feet position.

4. Child walks the rungs of a ladder, which is lying flat on the floor, in the hands and feet position.

5. Child walks the side rails of a ladder, which is raised first to 2' and then to 4' at one end, in the hands and feet position.

6. Child walks the rungs of a ladder, which is raised first to 2' and then to 4' at one end, in the hands and feet position.

* Allow child to determine stepping pattern. However, if child hesitates with task, encourage a "mark time" pattern.

Note: Encourage child to use any available sliding apparatus in the gymnasmum, classroom, playground, etc.
ACTIVITY: LADDER CLIMBING

LEVEL: III

Behavioral Objective:

To climb up two or more steps using an alternate stepping pattern and down using a two foot landing with the dominant foot leading. When standing in front of and touching a ladder, the child, using alternate stepping to ascend and a two foot landing with the dominant foot leading to descend, climbs up and down 2 or more steps two out of three times.

Teaching-Learning Experiences:

1. Child climbs up and backs down an inclined board using an alternate foot pattern while in the hands and feet position.

2. Child walks forward and backward in the hands and feet position on a bench approximately 12" wide using an alternate foot pattern.

3. Child is assisted into an alternate foot pattern while walking the rungs of a ladder which is 4' off the ground at one end.

4. Child climbs a ladder which is 4 feet off the ground at one end and which is covered with a piece of canvas (to prevent the child from falling through) using an alternate stepping pattern.

5. Child independently climbs a ladder which is 4' off the ground at one end using an alternate stepping pattern.
Behavioral Objective: 1

To climb up and down two or more steps using an alternate stepping pattern — when standing in front of and touching a ladder, the child, using an alternate stepping pattern, climbs up and down 2 or more steps two out of three times.

Teaching – Learning Experiences:

1. Child is assisted into an alternate stepping pattern while descending the ladder which is positioned according to the suggested principle, i.e., for every foot the ladder is long, move the base of the ladder 6" away from the wall.
   For example, the base of a 10' ladder is 5' from the wall.
Supplementary Activities Utilising a Functionally Nature Climber

1. Sliding boards.
2. Cargo nets.
3. Stall bars.
4. Lind climbers.
5. Rope ladders.
6. Outdoor areas with steep, hilly areas.
### Skill of Stair Climbing

**Test Equipment:** Series of Steps

<table>
<thead>
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<th>Level I</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When positioned at the bottom of a series of steps,</td>
<td>When standing at the bottom of a series of steps,</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

**NOTE:** Examiner cannot serve as an aid in place of railing or wall.

**The child demonstrates one of the following behaviors:**
- a. creeps up 5 steps and slides down from step to step on the buttock,
- b. creeps up and down 5 steps,
- c. walks up and backs down while in a hands-foot position like animal walking.

| Shirley, 1933 | Espenschade and Eckert, 1967 |

**The child, with or without the aid of the railing or wall, walks up and down 5 steps and demonstrates the following behaviors in two out of three trials:**
- a. walks up using a two-foot landing (mark-time pattern),
- b. walks down either in the same manner or by sliding from step to step on the buttock.

| Bayley, 1935 | Gutteridge, 1939 | McCaskill and Wellman, 1938 | Wellman, 1937 |

**The child, with the aid of the railing or wall, walks up and down 5 steps and demonstrates the following behaviors in two out of three trials:**
- a. walks up using an alternate stepping pattern,
- b. walks down either in the same manner or by using a two foot landing (mark-time pattern).

| Bayley, 1935 | Gutteridge, 1939 | McCaskill and Wellman, 1938 | Wellman, 1937 |

**The child independently walks up and down 5 steps and demonstrates the following behaviors in two out of three trials:**
- a. walks up using an alternate stepping pattern,
- b. walks down using an alternate stepping pattern.

| Bayley, 1935 | Gutteridge, 1939 | McCaskill and Wellman, 1938 | Wellman, 1937 |
ACTIVITY: STAIR CLIMBING

LEVEL: I

Behavioral Objective: 
To climb up and down a series of 5 steps in a manner other than walking — When positioned at the bottom of a series of five (5) steps, the child ascends by creeping or walking on hands and feet and descends by sliding from step to step on the buttock or backing down in a hands and feet position two out of three times.

Teaching-Learning Experiences:
1. Child creeps over objects laid in his path, e.g., sticks, wands, ropes, etc.
2. Child creeps up and down or creeps up and slides down an inclined board.
   Note: Incline can be adjusted to eventually approximate the angle of a flight of stairs. Initially, incline should be approximately 8 to 10 feet in length and angled slightly.
3. Child creeps up and down or creeps up and slides down a series of steps constructed from mats.
   Note: Height of step should be less than 5 inches initially.
4. Same as T.L. #1 above except child executes task in hands and feet position.
5. Same as T.L. #2 above except child executes task in hands and feet position.
ACTIVITY: STAIR CLIMBING
LEVEL: II

Behavioral Objective: 1

To ascend a series of 5 steps using a two foot landing with a
dominant foot lead — when standing at the bottom of a series of five
(5) steps, the child, with or without the aid of the railing or wall,
walks up using a two foot landing with a dominant foot lead two out
of three times.

Teaching - Learning Experiences:
1. Child steps over objects, e.g., sticks, wands, ropes, etc. which
are held at different heights.
2. Child walks up one step constructed from a mat(s) with assistance
from a railing or wall.
   a. Height of step should increase gradually from approximately
      2 to 5 inches.
   b. Number of steps should increase gradually from 1 to 4.
   c. Gradually decrease assistance until child can walk unassisted.
      Note: A possible technique to facilitate stepping up onto
      the mat is stepping over a wand or stick held at mat level.
3. Child walks up one (then 2, 3, 4) step(s) of normal size (6") with
   assistance from a railing or wall.

Behavioral Objective: 2

To descend a series of 5 steps using a two foot landing with a
dominant foot lead — when standing at the top of a series of five (5)
steps, the child, with or without the aid of the railing or wall,
walks down using a two foot landing with a dominant foot lead two
out of three times.

Teaching - Learning Experiences:
1. Child steps up on and walks down an incline which is approximately
   6" high and 6' long.
2. Child steps off a single level object like a mat, toy block, etc.
   a. Height of object should increase gradually from approximately
      2 to 6 inches.
STAIR CLIMBING CONTINUED

Teaching - Learning Experiences: B.O. #2

3. Child steps off one step constructed from a mat(s) with assistance from a railing or wall.
   a. Height of step should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 1 to 4.
   c. Gradually decrease assistance until child can walk unassisted.

4. Child walks down one (then 2, 3, 4) steps of normal size (6") with assistance from a railing or wall.
ACTIVITY:  STAIR CLIMBING
LEVEL: III

Behavioral Objective: #1

To ascend a series of 5 steps using an alternate stepping pattern -- when standing at the bottom of a series of five (5) steps, the child, with the aid of the railing or wall, walks up using an alternate stepping pattern two out of three times.

Teaching - Learning Experiences:
1. Child walks on footprints without touching the floor between steps.
2. Using an alternate stepping pattern, the child steps over elevated sticks or wands which are approximately 1" off the floor.
3. Child walks up two steps constructed from mats with assistance from a railing or wall.
   a. Height of step should increase gradually from approximately 2" to 8 inches.
   b. Number of steps should increase gradually from 2 to 6.
   c. Gradually decrease assistance until child can walk unassisted.
4. Child walks up two (then 3, 4) steps of normal size (6") with assistance from a railing or wall.

Behavioral Objective: #2

To descend a series of 5 steps using an alternate stepping pattern -- when standing at the top of a series of 5 steps, the child, with the aid of the railing or wall, walks down using an alternate stepping pattern two out of three times.

Teaching - Learning Experiences:
1. Child steps on and walks down an incline which is approximately 8" high and 6' long.
2. Child walks down two steps constructed from mats with assistance from a railing or wall.
   a. Height of steps should increase gradually from approximately 2" to 8 inches.
   b. Number of steps should increase gradually from 2 to 6.
   c. Gradually decrease assistance until child can walk unassisted.
3. Child walks down two (then 3, 4) steps of normal size (6") with assistance from a railing or wall.
**ACTIVITY: STAIR CLIMBING**

**LEVEL: IV**

**Behavioral Objective:**

To independently ascend a series of 5 steps using an alternate stepping pattern -- when standing at the bottom of a series of five (5) steps, the child, without any assistance, walks up using an alternate stepping pattern two out of three times.

**Teaching - Learning Experiences:**

1. Using an alternate stepping pattern, the child steps over elevated sticks or wands which are approximately 6" off the ground.
2. Child independently walks up two steps constructed from mats.
   a. Height of steps should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 2 to 4.
   c. Gradually decrease assistance until child can walk unassisted.
3. Child independently walks up two (then 3, 4) steps of normal size (5).** Behavioral Objective:**

To independently descend a series of 5 steps using an alternate stepping pattern -- when standing at the top of a series of five (5) steps, the child, without any assistance, walks down using an alternate stepping pattern two out of three times.

**Teaching - Learning Experiences:**

1. Child steps on and walks down an incline which is approximately 12" high and 6' long.
2. Child independently walks down two steps constructed from mats.
   a. Height of steps should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 2 to 4.
   c. Gradually decrease assistance until child can walk unassisted.
3. Child independently walks down two (then 3, 4) steps of normal size (5).
SUPPLEMENTARY ACTIVITIES UTILIZING A
FUNCTIONALLY MATURE STAIR CLIMBING ABILITY

1. Runs to the top of a series of 3 steps constructed from mats and
   jumps off.

2. Runs up one side of a series of 3 steps constructed from mats and
down the other side.

3. With approximately 8" blocks arranged in a series, the child steps on
   the blocks as follows.
   a. Child steps with either foot.
   b. Child steps only with right foot.
   c. Child steps only with left foot.
   d. Child alternates feet.

   Note: Space between blocks must be greater to allow for
two steps.

4. Lind Climber activities:
   a. Single bar - step up
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
   b. Double bar - stair step effect
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
   c. Triple bar - stair step effect
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
APPENDIX D

COVER LETTER AND SECOND SET OF CURRICULUM MATERIALS WITH CORRESPONDING REVISED O.S.U. SIGMA
Dear

On April 1, 1975, I sent you copies of the first set of performance-based, teaching-learning experiences for four skills of the fundamental motor skills curriculum. At that time, I asked you to critically review the initial set of four skills and return them to me by April 21, 1975. If you have not completed that process, would you please take some time in the next day or so and finish the review. I would appreciate your returns within the next week.

Enclosed are copies of the performance-based, teaching-learning experiences for the next three skills of the curriculum. As before please find attached to each skill a Materials Evaluation Form which should be completed after reviewing and/or implementing the materials for that skill. The Materials Evaluation Form, along with your written comments on the skill sheets, will again serve as your method of providing feedback relative to the merits and shortcomings of the curriculum.

This is the second of three sets of curriculum experiences you will receive. In order that I might retain the projected mailing schedule, I would appreciate having the enclosed Materials Evaluation Form and Curriculum Materials on each skill completed and mailed to me by May 12, 1975. For your convenience, I have enclosed a stamped, self-addressed envelop.

Again, thank you for your assistance in this endeavor.

Sincerely,

E. Michael Loovis
Assistant Project Director
Adapted Physical Education
### Skill of Jumping (Broad J.)

**Test Equipment:** Step 8" high; Piece of Paper 8"x11" (alternatives—tape, rope, etc.)

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position on the edge of an object or step approximately 8&quot; high.</td>
<td>When in a standing position with his toes touching the 11&quot; side (length) of an 8&quot;x11&quot; piece of paper (test sheet).</td>
<td>Same</td>
<td>When in a standing position with his toes touching the 8&quot; side (width) of an 8&quot;x11&quot; piece of paper (test sheet).</td>
</tr>
<tr>
<td><strong>NOTE</strong></td>
<td>Encourage child to jump as far past the paper as possible!</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>The child jumps the width (8&quot;) of the paper and demonstrates the following behaviors in two out of three trials:</td>
<td>The child jumps the width (11&quot;) of the paper and demonstrates the following behaviors in two out of three trials:</td>
<td>The child jumps the length (11&quot;) of the paper and demonstrates the following behaviors in two out of three trials:</td>
</tr>
<tr>
<td></td>
<td>a. uses two foot take-off which looks more like a two foot jump in place,</td>
<td>a. uses two foot take-off and landing,</td>
<td>a. uses two foot take-off and landing,</td>
</tr>
<tr>
<td></td>
<td>b. maintains arms at the sides in a bent manner during the jump.</td>
<td>b. swings arms backwards initially then forward and overhead during push-off of jump,</td>
<td>b. swings arms backwards initially then forward and overhead during push-off of jump,</td>
</tr>
<tr>
<td>Guttridge, 1939</td>
<td>Hellebrandt et al., 1961</td>
<td>Hellebrandt et al., 1961</td>
<td>Hellebrandt et al., 1961</td>
</tr>
<tr>
<td>Wellman, 1937</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: arms remain in this position until end of jump.*

c. brings arms along side of or in front of body in landing to assist with balance.

d. maintains balance without touching the hands to the floor at end of jump.
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: JUMPING

LEVEL: I

Behavioral Objective:

To jump down from an object or step approximately 8" high using a two foot take off and landing -- then in a standing position on the edge of an object or step approximately eight (8) inches high, the child, using a simultaneous two foot take off and landing, independently jumps down without falling two out of three times.

Teaching-Learning Experiences:

* 1. Child steps down on one foot and then the other foot from a height of approximately 8" without falling.

* 2. Child leaps down from one foot to the other foot from a height of approximately 8" without falling.

* 3. Child jumps down with one foot leading and landing on both feet from a height of approximately 8" without falling.

* In each case the instructor may initially assist child.
ACTIVITY: JUMPING
LEVEL: II

Behavioral Objective: 
To develop horizontal jumping for distance, i.e., 3-12 inches --
The child, using a two foot take off, jumps forward 8-12 inches two out
of three times.

Teaching - Learning Experiences:
1. Review Level I teaching - learning experiences -- height increases
8-12 inches.
2. Child imitates instructor who crouches and rises on her toes -- child
holds teacher's hands.
   a. Child performs independently.
3. Child bounces on mini-trampoline 5 consecutive times while holding
teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive times
      while supported by a stick held by instructor.
4. Child jumps from a mat approximately 8" high into a hoop, etc. which
   is placed just beyond the spot where the child would land if he stepped
down. The hoop, etc. can be gradually moved further away.
5. Child jumps forward over painted lines on the floor, rope(s), etc.
   a. Child holds teacher's hands
   b. Child holds onto a wand with both hands.
   c. Child holds teacher's hand.
   d. Child holds onto a wand with one hand.
   e. Child jumps independently.
ACTIVITY: JUMPING
LEVEL: III

Behavioral Objective: #1
To develop rhythmic coordination of arms and legs while in a stationary standing position — While standing with his arms at his sides and in a stationary standing position, the child swings his arms backward while bending his knees and then swings his arms forward to at least head level while straightening his knees (stretch body) two out of three times.

Teaching - Learning Experiences:

1. Instructor stands behind child and physically manipulates arm swing.

2. Instructor faces child with his arms outstretched and palms down; child swings arms from back position so as to strike instructor's hands with his own.

3. With his arms at his sides, child swings arms back and forth independently in a pendulum like manner.

4. With assistance, child swings arms backward while bending knees and then swings arms forward to at least head level while straightening his knees (stretch body). This should eventually be done rhythmically and independently.

Behavioral Objective: #2
To develop horizontal jumping for distance, i.e., 12-18 inches, and landing on two feet simultaneously — The child, using a two foot take off and landing and swinging the arm to at least head level as jump is executed, independently jumps forward 12-18 inches two out of three times.

Teaching - Learning Experiences:

1. Review Level I teaching - learning experiences -- height increases 12-16 inches.
   Emphasis is on simultaneous two foot take off and landing.

2. Child jumps from a set of footprints to another set of same or from squares on the floor to other squares.
   Emphasis is on simultaneous two foot take off and landing.

3. Child jumps forward over painted lines on the floor, ropes, etc.
ACTIVITY: JUMPING
LEVEL: IV

Behavioral Objective: #1

To demonstrate a mature jump for distance (18-24") -- The child jumps forward 18-24" using a two foot take off and landing; swinging arms backward and then forward to above head level during push off of jump; dropping arms to a position in front of body in landing, and maintaining balance without touching the hands to the floor at the end of jump two out of three times.

Teaching-Learning Experiences:

1. Jump in and out of various patterns and designs on the floor made by jumping ropes, hoops, wands, benches, or balance beams.
2. Jump over a stick positioned at various heights - begin initially a few inches off the floor and raise stick as child performs more skillfully.
3. Place several sticks on the floor. Jump over the sticks consecutively.
   a. Use two sticks.
   b. Use three sticks, etc.
4. Child jumps over sticks or wands placed on blocks or standards approximately 6 to 12 inches high (like hurdles).
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY NATURAL JUMP

1. Jump sideways; jump backwards.
   a. Jump over a stick sideways then backwards.

2. Jump over a stick while holding one end and resting the other on the ground.

3. Jump over stick, tire, etc. and add turn in the air.
   a. \( \frac{1}{4} \) turn.
   b. \( \frac{1}{2} \) turn.
   c. Whole turn.

4. Instructor holds two sticks approximately shoulder width apart, child jumps between sticks and then out from between them.
   a. Start with sticks at a reasonable height and gradually increase it.
   b. Raise one stick higher than the other.
   c. Change the distance between the sticks.

5. Jump the shot. Instructor swings a rope around his body in a circle of about 6 feet. Child jumps over the end of the rope when it comes to him. (a weight is needed on the end of the rope to keep it on the floor).

6. Child jumps from figure to figure, letter to letter, or number to number on request and/or first identifying the figure, letter, or number.


8. Jump a rolling tire.
   a. Front jump.
   b. Side jump.
   c. Straddle jump.
   d. Step jump.

9. Child does a running broad jump.

10. Child jumps over a stick which he holds in both hands.

* These as well as numerous other items related to jumping may be found in:

<table>
<thead>
<tr>
<th>TEST CONDITIONS</th>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position and with the examiner approximately 25 feet in front of him,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>The child cannot skip but will likely demonstrate any of the following behaviors in two out of three trials:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. running</td>
<td>The child attempts to do 1 or more consecutive skips while doing a normal walking or running pattern and demonstrates the following behaviors in two out of three trials:</td>
<td>a. alternates feet, b. does not use arms in opposition (if at all), c. does skipping pattern slowly, and it appears segmented (the child may walk or run for brief periods).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. hopping</td>
<td>a. performs skip more often than not on the same leg though not necessarily consecutively, b. holds arms sideward and slightly bent with hands at approximately chest level.</td>
<td>a. alternates feet, b. uses arms in opposition (right arm forward when left leg is forward), c. executes skip with ease and good coordination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. leaping--take off made from one foot and landing on the alternate foot, d. galloping--combination of walk and leap.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gutteridge, 1939</td>
<td>Gutteridge, 1939</td>
<td>Gutteridge, 1939</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wallman, 1937</td>
<td>Wallman, 1937</td>
<td>Wallman, 1937</td>
<td></td>
</tr>
</tbody>
</table>
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: SKIPPING

LEVEL: I

Behavioral Objective: #1

To gallop a distance of approximately 25' -- when standing and facing the instructor who is approximately 25 feet in front of him, the child independently gallops, i.e., combination of walk and leap, in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child stands with preferred foot well ahead of the other foot and on a footprint or the outline of a footprint on the floor; he then slides rear foot to a position behind the lead foot.

2. Child takes a single step with preferred foot onto a footprint or the outline of a footprint on the floor; he then slides rear foot to a position behind the lead foot.

3. Child takes a single step with preferred foot (no visual cues), and then slides the rear foot to a position behind the lead foot.

   a. Footprints or the outline of footprints on the floor may be useful initially.

5. Child performs a series of step-slide movements to music or rhythmic accompaniment.
Activity: Skipping

Level: II

Behavioral Objective:

To skip consecutively once on each foot -- when standing and facing the instructor who is approximately 25 feet in front of him, the child independently and consecutively skips once on each foot in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child hops in place 2 or more times consecutively first on the right foot and then on the left foot.

2. Child takes one step up to a rope or a line on the floor, etc. and hops over with lead foot.
   a. Reverse lead foot.

3. Child steps and hops -- no visual cues like a rope or a line.
   a. Reverse lead foot.

4. Child takes one step up to a rope or a line on the floor, etc. and hops over with the lead foot, using the opposite foot, the child steps up to a second rope, etc. and hops over with the lead foot.

5. Child takes one step and hops with lead foot followed by a step and hop on the opposite foot -- no visual cues.

6. While walking, child steps and hops once on each foot in succession.

Note: Movement can be performed to music or rhythmic accompaniment, e.g., clapping hands, rhythm sticks, tambourines, records.
Behavioral Objective:

To skip alternately twice on each foot — when standing and facing the instructor who is approximately 25 feet in front of him, the child independently and alternately skips twice on each foot in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child hops rhythmically in place alternating feet.
   
   a. Hop once on right and left.
   b. Hop twice on right and left.
   c. Hop twice on right and once on left.
   d. Hop once on right and twice on left.

2. Child takes one step up to a rope or a line on the floor, etc. and hops over with the lead foot; using the opposite foot, the child steps up to a second rope, etc. and hops over with the lead foot.
   
   a. Add ropes or lines gradually until child is stepping and hopping 3 to 8 times in succession.

3. While walking and alternating feet on each step, the child stops and hops at least 4 steps in succession.
ACTIVITY: SKIPPING

LEVEL: IV

Behavioral Objective: 

To skip consecutively while alternating feet for a distance of approximately 25' — when standing and facing the instructor who is approximately 25 feet in front of him, the child independently and consecutively skips in the direction of the instructor for a distance of approximately 25 feet while alternating feet two out of three times.

Teaching-Learning Experiences:

1. Child takes one step up to a rope or a line on the floor, etc. and hops over with the lead foot; using the opposite foot, the child steps up to a second rope, etc. and hops over with the lead foot.

   a. Add ropes or lines gradually until child is stepping and hopping 4 to 6 times in succession.

2. While walking and alternating feet on each step, the child steps and hops at least 8 steps in succession.

3. Child skips to music or rhythmic accompaniment, i.e., clapping hands, rhythm sticks, tambourines, records.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY NATIVE SKIP

1. Skip forward, in a big circle, on a diagonal.
2. Skip backward.
3. Skip varying speed, fast or slow.
4. Skip while dribbling a ball.
5. Change from a skip to a gallop or vice versa.
   a. Skip to run.
   b. Skip to walk.
### Test Equipment
None

### Test Conditions

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position with the feet parallel and next to each other.</td>
<td>When in a standing position supported on one leg with the other foot held just a few inches above the floor.</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

**Note:** Child may use either foot but may not hold the foot. Ask child to hop as "high" as he can!

- The child, using a simultaneous two foot take off and landing, jumps at least three consecutive times in two out of three trials either straight up and down or forward in a broad jump fashion.

- The child attempts to hop and demonstrates the following behaviors in two out of three trials:
  - a. Raises both arms sideways, usually to chest level (NOTE: arm on side of non-support leg may be straight; arm on side of support leg may be bent),
  - b. Raises non-support leg with knees out to sides as high as possible simultaneous with arm movement,
  - c. Straightens knee and ankle of support leg to rise up on toes when attempting to hop but support foot does not leave ground.

- The child attempts to hop forward across the floor and demonstrates the following behaviors in two out of three trials:
  - a. Holds both arms bent at elbows sideways at approximately shoulder level,
  - b. Holds bent non-support leg off the floor with knee at approximately waist level,
  - c. Lifts foot of support leg off the floor and quickly returns it.

- The child hops forward across the floor on one foot two or more times by coordinating the following behaviors in two out of three trials:
  - a. Swings arms upward to aid in lifting body off the floor,
  - b. Lifts bent non-support leg upward simultaneous with arm swing,
  - c. Straightens support leg to lift body off the floor.

### Performance

- Gutteridge, 1939
- McCaskill and Wellman, 1938
- Wellman, 1937
- Halverson et al., 1973
Behavioral Objective:  

To hop on 2 feet at least 2 consecutive times -- when in a standing position with feet parallel and next to each other, the child, using a simultaneous two foot take off and landing, independently hops forward in a broad jump fashion at least two consecutive times two out of three times.

Teaching - Learning Experiences:

1. Child imitates instructor who crouches and rises on her toes - child holds teacher's hands.
   a. Child performs independently.

2. Child bounces on mini-trampoline 5 consecutive times while holding teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive times while supported by a stick held by instructor.

3. Child jumps from a mat approximately 8" high into a hoop, etc. which is placed just beyond the spot where the child would land if he stepped down. The hoop, etc. can be gradually moved further away.
   a. Jumps holding one hand.
   b. Jumps holding an object like a stick/wand, etc.
Behavioral Objective: 

To balance on 1 foot for 3-5 seconds — when in a standing position supported on one leg and with the bent non-support leg held in front of the body and a few inches above the floor, the child maintains his balance on one foot for three to five seconds two out of three times.

Teaching - Learning Experiences:

1. Child steps over obstacles laid in his path, e.g., wands, sticks, even the rungs of a ladder.
   a. Increase height of obstacles gradually.
   b. Eventually, child should walk in an alternating pattern.

2. Child steps in and out of a series of tires.

3. Child steps on and attempts to burst balloons.

4. Child walks a 2 inch line with heel-toe progression.

5. Child maintains a one foot static balance position for increasingly longer periods of time with assistance from instructor initially.
   a. Child holds teacher's hands.
   b. Child holds onto a wand with both hands.
   c. Child holds teacher's hand.
   d. Child holds onto a wand with one hand.
   e. Child independently executes one foot static balance for one, two, three seconds, etc.

* Assistance can be lessened as child becomes more confident of balance.
ACTIVITY: HOPPING
LEVEL: III

Behavioral Objective:
To hop forward on 1 foot at least 1 time when in a standing position supported on one leg and with the bent nonsupport leg held in front of the body and a few inches above the floor, the child hops forward on one foot at least once two out of three times.

Teaching - Learning Experiences:
1. Child imitates instructor who rises on her toe while in a one-foot static balance - child holds teacher's hands.
   a. Child performs independently.

2. Child bounces on one foot on the mini-trampoline 5 consecutive times while holding teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive times while supported by a stick held by instructor.

* 3. Child hops forward over lines, ropes, etc. on one foot at least one step with assistance from the instructor initially.
   a. Child holds teacher's hands.
   b. Child holds onto a wand with both hands.
   c. Child holds teacher's hand.
   d. Child holds onto a wand with one hand.
   e. Child executes hop independently.

* 4. Child hops forward (no visual cues like lines or ropes, etc.) on one foot at least one step with assistance from the instructor initially.
   a.
   b.
   c. Same as §3 above.
   d.
   e.

* Assistance can be lessened as child becomes more confident and skillful.
Behavioral Objective: To hop forward on 1 foot at least 2 consecutive times -- when in a standing position supported on one leg and with the bent non-support leg held a few inches above the floor and in front of the body, the child hops forward on one foot at least two consecutive times by swinging arms forward and upward to aid in lifting the body; lifting bent non-support leg upward simultaneously with arm swing, and straightening support leg to lift body off floor two out of three times.

Teaching - Learning Experiences:

1. Child hops in place.
   a. Hop 1, 2, 3, 4 times, etc. on right foot.
   b. Same on left foot.
   *c. Hop once on right and then on left.
   *d. Hop twice on right and then on left.

   * Attempt to do in a continuing pattern.

2. Child hops forward on one foot.
   a. Right foot only.
   b. Left foot only.

   * 3. Child hops forward over lines, ropes, etc. on one foot at least two steps with assistance from the instructor initially.
      a. Child holds teacher's hands.
      b. Child holds onto a wand with both hands.
      c. Child holds teacher's hand.
      d. Child holds onto a wand with one hand.
      e. Child executes hop independently.

   * 4. Child hops forward (no visual cues like lines or ropes, etc.) on one foot at least two steps with assistance from the instructor initially.
      a.
      b.
      c. Same as #3 above.
      d.
      e.

   * Assistance can be lessened as child becomes more confident and skillful.
1. Hop forward over a series of lines.
2. Hop forward and backward over a line.
3. Hop varying the speed, fast or slow.
4. Hop varying height and length.
5. Hop sideward (right and left) and diagonally over a line.
6. Hop sideward.
   a. Move to left on left leg then on right.
   b. Move to right on right leg then on left.
7. Hop over objects.
8. Hop on lines; then on walking board.
9. Hop in and out of various patterns and designs on the floor.
APPENDIX E

COVER LETTER AND THIRD SET OF CURRICULUM MATERIALS WITH CORRESPONDING REVISED O.S.U. SIGMA
Dear

On April 18, 1975, I sent you copies of the second set of performance-based, teaching-learning experiences for three skills of the fundamental motor skills curriculum. At that time, I asked you to critically review the second set of three skills and return them to me by May 12, 1975. If you have not completed that process, would you please take some time in the next day or so and finish the review. I would appreciate your returns within the next week.

Enclosed are copies of the performance-based, teaching-learning experiences for the next four skills of the curriculum. As before please find attached to each skill a Materials Evaluation Form which should be completed after reviewing and/or implementing the materials for that skill. The Materials Evaluation Form, along with your written comments on the skill sheets, will again serve as your method of providing feedback relative to the merits and shortcomings of the curriculum.

This is the final set of curriculum experiences you will receive. In order that I might retain the projected evaluation schedule, I would appreciate having the enclosed Materials Evaluation Form and Curriculum Materials on each skill completed and mailed to me by June 2, 1975. For your convenience, I have enclosed a stamped, self-addressed envelop.

Again, thank you for your assistance in this endeavor.

Sincerely,

E. Michael Loovis
Assistant Project Director
Adapted Physical Education
**TEST EQUIPMENT:** Plastic bat 20" to 36" long depending on size of child and 6" Playground Ball suspended by a string approx. 1" long which is attached to a stick.

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position, holding a plastic bat 20&quot; to 36&quot; long, and facing a ball 6&quot; in diameter suspended by a string to waist level,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td><strong>TEST CONDITIONS</strong></td>
<td><strong>PERFORMANCE</strong></td>
<td><strong>TEST CONDITIONS</strong></td>
<td><strong>PERFORMANCE</strong></td>
</tr>
<tr>
<td>The child strikes the ball and demonstrates the following behaviors in two out of three trials: a. uses only one arm, the bat being positioned on or near the shoulder, b. swings in either an overhead (chopping) motion or a sidearm motion (right to left or vice versa).</td>
<td>Halverson and Robertson, 1966</td>
<td>Wickstrom, 1970</td>
<td>Wickstrom, 1970</td>
</tr>
<tr>
<td>The child strikes the ball and demonstrates the following behaviors in two out of three trials: a. uses both arms, the bat being positioned in front of and adjacent to the shoulder, b. swings in an overhead manner with a downward (chopping) motion, c. bends forward at the waist (the feet do not move).</td>
<td>Wickstrom, 1970</td>
<td>Wickstrom, 1970</td>
<td>Wickstrom, 1970</td>
</tr>
<tr>
<td>The child strikes the ball and demonstrates the following behaviors in two out of three trials: a. uses both arms, the bat being positioned in front of and adjacent to the shoulder, b. shifts body weight in direction of swing (this is a rocking motion; it is not a step), c. swings in a sidearm motion (right to left or vice versa), but arc of swing is flat (horizontal) or downward.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOTE: Ask child to hit the ball as &quot;hard&quot; as he can!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinclair, 1973</td>
<td>Wickstrom, 1970</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: STRIKING

LEVEL: I

Behavioral Objective: #1

To swing a bat with one hand in a sidearm motion, the feet may or may not move when in a standing position, holding a plastic bat (or 1" wooden dowel) 26 to 36 inches long in one hand, and with the shoulder of the free hand facing the instructor, the child, using a sidearm swing, strikes a balloon tossed at waist level two out of three times; his feet may or may not move.

Teaching-Learning Experiences:

1. Child beats a drum with his hand.
   a. Uses a stick.

2. Child strikes an inflatable Bo-Bo clown or a floor punching bag with his hand.
   a. Uses a stick or wand.

3. With his hand child strikes balloons tied to string and supported from the ceiling or other support structure.
   a. Sitting on floor.
   b. Kneeling on floor.
   c. Standing.

4. With a paddle, child strikes balloons tied to string and supported from the ceiling or other support structure.

5. With his hand, child strikes a tossed balloon.
   a. Strikes balloon with paddle.
   b. Strikes balloon with a plastic bat or 1" wooden dowel.
ACTIVITY: STRIKING

LEVEL: II

Behavioral Objective: 

To swing a bat with two hands in a sidearm motion, the feet may or may not move. Then in a standing position, holding a plastic bat (or 1" wooden dowel) 26 to 36 inches long in two hands, and with the side opposite the bat facing the instructor, the child, using a sidearm swing, strikes a balloon tossed at waist level two out of three times; his feet may or may not move.

Teaching-Learning Experiences:

1. With two hands on a bat, the child hits a balloon or large playground ball off a batting tee.

2. With two hands on a bat, the child strikes a balloon tied to string and supported from the ceiling or other support structure.

3. With two hands on a bat, the child strikes a balloon tied to string and supported from the ceiling or other support structure and moving in an arc toward him.

4. With two hands on a bat, the child strikes a tossed balloon.
Activity: Striking

Level: III

Behavioral Objective:

To swing a bat with two hands in a sidearm motion, with trunk rotation, the feet may or may not move -- when in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 36 inches long in two hands, and with the side opposite the bat facing the instructor, the child, shifting his body weight in the direction of swing and swinging in a sidearm motion, strikes a ball 6 inches in diameter tossed at waist level two out of three times; his feet may or may not move.

Teaching-Learning Experiences:

1. While standing with feet spread, the child wraps his arms around a bat positioned behind him and parallel to the floor and twists first to one side and then the other repeatedly.

2. With his back against the wall, the child clasps his hands with arms extended and swings from side to side repeatedly while touching the wall on both sides.

3. Instructor places his hand approximately 1 to 5 inches from the middle of the child's back at shoulder level; the child then turns from side to side repeatedly stopping each time he feels the instructor's hand.

4. Child clasps his hands with arms extended and swings from side to side repeatedly while striking balloons on both sides which are tied to strings and supported from the ceiling or other support structure.

5. With two hands on a bat, the child hits a 6" ball off a batting tee with emphasis on twisting body.

6. With two hands on a bat, the child strikes a 5" ball tied to string and supported from the ceiling or other support structure with emphasis on twisting body.

   a. Strikes balloon tied to string and moving in an arc toward him.

7. With two hands on a bat, the child strikes a tossed balloon with emphasis on twisting body.

8. With two hands on a bat, the child strikes a tossed balloon with emphasis on twisting body.
Behavioral Objective: 

To swing a bat with two hands in a sidearm motion, with trunk rotation, and with a step in the direction of the swing -- then in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 26 inches long in two hands, and with the side opposite the bat facing the instructor, the child, stepping and shifting body weight in direction of swing, twisting hips and upper body during and after the shifting motion, and swinging with a sidearm motion, strikes a ball 6 inches in diameter tossed at waist level two out of three times.

Teaching-Learning Experiences:

1. While standing with his feet on the appropriate footprints and with two hands on a bat, the child strikes a tossed balloon with emphasis on twisting body.
   a. Strikes tossed ball 6" in diameter.
   b. Strikes tossed tennis ball.

2. Same as above except child takes a short step, i.e., 3-5 inches, forward with lead foot (may be onto another footprint) and strikes a tossed balloon.
   a. Strikes tossed ball 6" in diameter.
   b. Strikes tossed tennis ball.

3. Child strikes as above without the use of visual cues.

4. In the appropriate striking stance, the child takes a full step, i.e., 6-9 inches, forward with lead foot (may be onto another footprint) and strikes a tossed balloon.
   a. Strikes tossed ball 6" in diameter.
   b. Strikes tossed tennis ball.

5. Child strikes as above without the use of visual cues.
1. Drop ball and hit it after it bounces.
2. Serve as in volleyball (to the wall or to a partner).
3. Hits ball out of hand.
4. Plays paddle ball games.
5. Bats off tee for accuracy.
6. Bats off tee for distance.
7. Hits ball against wall repeatedly using hand, paddle or racket.
### Skill of Kicking

**TEST EQUIPMENT:** 6" Rubber Playground Ball

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When in a standing position with a ball approximately 6&quot; in diameter placed in front of but not more than two feet away from him;</td>
<td>Same</td>
<td>When in a standing position with a ball approximately 6&quot; in diameter placed in front of but not more than five feet away from him, <em>ask child to kick the ball as &quot;hard&quot; as he can!</em></td>
<td>When in a standing position with a ball approximately 6&quot; in diameter placed in front of but not more than ten feet away from him,</td>
</tr>
</tbody>
</table>

**TEST CONDITIONS**
- The child walks up to the ball, makes contact with a stiff-leg and continues with the walking/running pattern in two out of three trials. Kick appears as part of walking/running pattern and shows no attempt to swing the kicking leg.

**PERFORMANCE**
- The child walks up to and kicks the ball forward in the direction of the examiner and demonstrates the following behaviors in two out of three trials:
  - a. uses a stiff-leg swinging primarily from the hip with little or no bending of the knee,
  - b. moves the arms and trunk only slightly, if at all.

**Gesell, 1940**

<table>
<thead>
<tr>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
</table>
| The child walks up to and kicks the ball forward in the direction of the examiner and demonstrates the following behaviors in two out of three trials:
  - a. uses a stiff-leg swinging from the hip with little or no bending of the knee,
  - b. moves the arms and trunk only slightly, if at all. | The child runs up to and kicks the ball forward in the direction of the examiner and demonstrates the following behaviors in two out of three trials:
  - a. swings the bent kicking leg backwards and then forward with a simultaneous straightening of the leg,
  - b. holds arm opposite from kicking leg out to the side approximately shoulder level,
  - c. returns kicking leg to a position next to the support leg after executing kick, | The child runs up to and kicks the ball forward in the direction of the examiner and demonstrates the following behaviors in two out of three trials:
  - a. swings the bent kicking leg backwards and then forward with a simultaneous straightening of the leg,
  - b. uses both arms held out to the sides of the body to maintain balance,
  - c. is slightly backward as kick is performed,
  - d. maintains balance on non-kicking leg during kicking action and follow through, e. steps forward onto kicking leg only after kicking action and follow through are completed. |

**Wickstrom, 1970**

<table>
<thead>
<tr>
<th>LEVEL III</th>
<th>LEVEL IV</th>
</tr>
</thead>
</table>
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: KICKING

LEVEL: I

Behavioral Objective: #1

To walk up to a ball and make contact with it — when in a standing position and in front of but not more than two feet away from a ball approximately 6-8 inches in diameter, the child either walks up to and steps on ball or walks up to and pushes the ball two out of three times.

Teaching-Learning Experiences:

1. While sitting, child kicks a ball with his feet.

2. While walking, child pushes a large beach ball or cage ball with his body, primarily the lower extremities.

   Note: Hands should not be used.

   a. Child walks up to large beach ball or cage ball, makes contact and continues to push it.

3. While walking, child pushes bean bags/yarn balls with his feet.

4. Child walks up to and either touches, steps on or pushes a balloon.

5. Child walks up to an either touches, steps on or pushes a 6-8 inch ball.
Behavioral Objective: 1

To kick a ball from a stationary standing position with bent knee action -- when in a standing position and with a ball approximately 6-8 inches in diameter placed in front of his foot, the child, using a bent knee action, kicks the ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child lays on his back with knees bent and feet flat on the floor; he swings the entire leg in an attempt to kick a balloon held by the instructor or other support structure.

2. While sitting on a chair large enough to prevent his feet from touching the floor, the child kicks a balloon.
   a. Kicks a ball.

3. While leaning with both hands against an object at approximately shoulder level, e.g., parallel bars or rings, etc., the child kicks a balloon.
   a. Kicks a 6-8 inch ball (emphasis on bent knee).

4. With the instructor supporting one side/arm, child kicks a balloon.
   a. Kicks a 6-8 inch ball (emphasis on bent knee).

5. Child maintains a stationary one-foot balance position on the non-kicking leg for 1-3 seconds.
   a. Child attempts to break balloons with his feet.

6. Child maintains a stationary one-foot balance position on the non-kicking leg for 1-3 seconds and then simulates a kicking motion.

7. Child independently kicks a stationary balloon with emphasis on bent knee action.

8. Child independently kicks a 6-8 inch stationary ball with emphasis on bent knee action.
ACTIVITY: KICKING

LEVEL: III

Behavioral Objective: 

To walk up to and kick a ball by swinging the bent kicking leg forward with simultaneous straightening of the leg — when in a standing position and with a ball approximately 6-6 inches in diameter placed in front of but not more than 5 feet away, the child walks up to the ball, places his weight on the non-kicking leg, swings the bent kicking leg forward with simultaneous straightening of the leg and kicks the ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. While walking slowly, the child performs a series of one foot balance tasks up to 3 seconds duration, i.e., step-balance on left, step-balance on right, etc.

2. While walking slowly, the child performs a series of one foot balance tasks and then simulates a kicking motion, i.e., walk-balance-kick, walk-balance-kick, etc.

3. While in a stationary standing position, the child maintains his balance on the non-kicking leg for 2-3 seconds and then kicks a 6-8 inch ball placed on the floor in front of him.

4. When in a stationary standing position, the child kicks a 6-8 inch ball rolled toward him.

5. Child walks up to a ball, places his weight on the non-kicking leg, maintains this position for 2-3 seconds and then kicks the 6-8 inch ball.
Behavioral Objective: To run up to and kick a ball by swinging the bent kicking leg forward with simultaneous straightening of the leg, by leaning the body backward, and by stepping forward onto the kicking leg after follow through -- then in a standing position and with a ball approximately 6-8 inches in diameter placed in front of but not less than 10 feet away, the child runs up to the ball, places his weight on the non-kicking leg, swings bent kicking leg forward with simultaneous straightening of the leg, leans body backward, and kicks the ball in the direction of the instructor two out of three times; after each kick, he steps forward onto the kicking leg -- only after the follow-through is completed.

Teaching-Learning Experiences:

1. When in a stationary standing position, the child kicks a 6-8 inch ball placed on the floor in front of him.

2. When in a stationary standing position, the child kicks a 6-8 inch ball rolled toward him.

3. While walking, child kicks a 6-8 inch ball rolled toward him.

4. While running the child places his weight on the non-kicking leg and simulates a kicking motion; after the follow through, he steps forward onto a footprint or other object with the kicking foot.

5. Child runs and kicks a 6-8 inch ball and then steps onto a footprint or other object with the kicking foot.

6. Same as above without visual cue.
1. While running, child kicks a ball rolled to him.
2. Child kicks for distance.
3. Child kicks with accuracy at targets placed on the wall or on the floor.
5. Kick ball back and forth with a partner.
6. Keep a ball going by kicking it repeatedly against a wall.
7. Kick a ball dropped from his hand(s).
### SKILL OF Throwing

**TEST EQUIPMENT:** 6" Rubber Playground Ball and Tennis Ball

<table>
<thead>
<tr>
<th>LEVEL I</th>
<th>LEVEL II</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST CONDITIONS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing in front of and five feet from the examiner,</td>
<td>Same</td>
<td>Standing in front of and ten feet from the examiner,</td>
<td>Standing in front of and fifteen feet from the examiner,</td>
</tr>
<tr>
<td>NOTE: Ask child to throw the ball as &quot;hard&quot; as he can</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PERFORMANCE

<table>
<thead>
<tr>
<th>Gutteridge, 1939</th>
<th>Wild, 1938</th>
<th>Wild, 1938</th>
<th>Wild, 1938</th>
</tr>
</thead>
</table>
| The child throws the 6" ball in the direction of the examiner and demonstrates the following behaviors in two out of three trials:  
  a. uses a two-handed push or throw with both arms in unison,  
  b. no twisting of the upper body. | The child throws the tennis ball in the direction of the examiner and demonstrates the following behaviors in two out of three trials:  
  a. uses a single-handed throw with the arm swinging in a sidearm (right to left or vice versa) motion, and the direction of swing is either downward or flat,  
  b. no twisting of the upper body. | The child throws the tennis ball in the direction of the examiner and demonstrates the following behaviors in two out of three trials:  
  a. uses a single-handed throw with the arm swinging in a sidearm (right to left or vice versa) motion, and the direction of swing is downward,  
  b. twists upper body backwards and shifts weight to foot on side of throwing arm during backswing,  
  c. steps with leg on side opposite throwing arm,  
  d. twists upper body forward after shifting weight to foot opposite throwing arm,  
  e. snaps wrist in process of releasing ball. | Wild, 1938 |
Behavioral Objective: 

To throw using 2 hands, feet do not move -- when standing approximately five feet from the instructor, the child throws a 6 inch playground ball with two hands (both arms used in unison) in the direction of the instructor two out of three times but does not move his feet or shift his body in any manner.

Teaching-Learning Experiences:

1. While sitting, child drops ball into instructor's hands.

2. While sitting with his legs spread and feet touching the wall, the child with assistance from instructor rolls the ball toward the wall.

3. While sitting, the child independently rolls the ball toward the wall and then toward the instructor.

4. While standing, the child drops the ball from waist/chest level to a spot on the floor. Gradually move spot away from child to increase bouncing of ball - this may be done facing a wall.

5. Child independently bounces ball toward instructor by using a two-hand throwing pattern.

6. Child throws ball at the wall with two hands and assistance from instructor.

7. Child throws ball to instructor with two hands.
ACTIVITY: THROWING
LEVEL: II

Behavioral Objective: To throw using 1 hand, upper body twist, feet do not move. When standing approximately five feet from the instructor and with feet opposite throwing arm ahead of other feet (staggered foot position), the child, using a single-hand sidearm throw and twisting the upper body first toward the side of the throwing arm and then forward to the opposite side, throws a tennis ball in the direction of the instructor two out of three times.

Staggered Foot Position is achieved by taking a normal standing position with feet approximately shoulder width apart and taking one step forward—preferably with foot opposite throwing arm.

Teaching-Learning Experiences:

1. While standing with feet spread, the child with his hands on his hips and then with his arms out to the sides at shoulder level, twists first to one side and then the other repeatedly.
   a. Perform in staggered foot position.

2. While standing in the staggered foot position approximately 1-2 feet away from the wall and with his back to the wall, the child twists and touches wall behind him on the side of the throwing arm, twists forward and swings at and attempts to slap balloons positioned at side of body approximately arm’s length away and between chest and waist level.
   a. Child twists and touches wall behind him on the side of the throwing arm, twists forward, and throws yarn balls, bean bags, tennis balls at balloons positioned just beyond arm’s distance away and between chest and waist level.
   b. Same as above except remove balloons and throw at large distant targets, e.g., a wall.
   c. Same as "b" except child is moved away from wall.

3. Given the teacher as a model, the child will imitate the teacher’s arm motion as she throws a tennis ball overhand.

4. While standing in the staggered foot position, the child is encouraged to hit a large target with no assistance from approximately 5-10 feet using yarn balls, bean bags, and tennis balls.
Behavioral Objective:

To throw while stepping with alternate foot — when standing approximately ten feet from the instructor, the child, using a single-hand, sidearm throw, twisting the body first toward the side of the throwing arm and then forward to the opposite side, and stepping with leg on side opposite throwing arm, throws a tennis ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. While standing with his feet on the appropriate footprints (foot opposite throwing arm is forward, pointing at target while the other foot is immediately behind the lead foot and positioned at a 45° angle), the child throws a tennis ball in the direction of the instructor or a target.

2. Same as above except child takes a short step forward with lead foot (maybe onto another footprint) and throws tennis ball in direction of instructor or target.

3. Child throws as above without the use of visual cues.

4. Child throws at targets of various sizes from 5 to 10 feet away.
Behavioral Objective:

To throw while stepping with alternate foot and demonstrating definite upper body twisting and shifting of body weight — when standing approximately fifteen feet from the instructor, the child, using a single-hand, sidearm throw; twisting upper body backwards and shifting weight to foot on side of throwing arm during backswing; stepping with leg opposite throwing arm and twisting upper body forward after shifting weight onto foot opposite throwing arm, and snapping wrist in process of releasing ball, throws a tennis ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child stands with shoulder facing target; he steps forward onto a footprint, etc. and throws tennis ball.

2. Child stands with shoulder facing target; he steps and throws tennis ball (no visual cues).

3. Child stands at a 45° angle to the target; he steps and shifts to a position with shoulder facing target, steps forward onto a footprint, etc. and throws tennis ball.

4. Same as above except no visual cues.

5. Child stands facing target; he steps and shifts to a position with shoulder facing target, steps forward onto a footprint, etc. and throws tennis ball.

6. Same as above except no visual cues.

7. Child throws at targets of various sizes from 10 to 15 feet away.

8. For refinement of wrist snap movement, the following activities are suggested:

a. With his elbow on the floor, the child throws yarn balls, bean bags, and tennis balls at a target on the floor at various distances.

b. With his elbow on the floor, the child throws yarn balls, bean bags, and tennis balls into a box, etc. which is only a short distance in front of him.
SUPPLEMENTARY ACTIVITIES UTILIZING A
FUNCTIONALLY HANDED THINGS

1. Throw and catch off wall.
2. Throw to pitch-back device.
3. Throw and break balloons taped to wall.
4. Throw different sizes and shapes of balls, e.g., a hand football.
5. Stretch rope(s) 5-6 feet off ground, child throws ball over rope and runs to other side to catch it.
   a. Increase height of rope.
   b. Gradually increase distance from side to side.
6. Throw for distance -- mark previous best to be used as target.
7. Throws with accuracy.
   a. Place various size targets on wall (small to large).
   b. After each success at a specified target, move further back and attempt to hit same target.
8. Throws with accuracy for distance.
   a. Place target on floor -- after each success move further back and attempt to hit same target.
   b. Suspend target -- same as above.
9. Plays catch with another person.
10. Work with a partner or in groups passing a ball or balls from one to another in rhythm.
    a. Vary with bounce passes.
### TEST CONDITIONS

<table>
<thead>
<tr>
<th>LEVEL I</th>
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<th>LEVEL IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the examiner stands five feet in front of the child and throws the ball underhand,</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td><strong>NOTE:</strong> Ball should reach the child between the shoulders and the waist! Ball should travel in an arc—not a straight line!</td>
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</tr>
</tbody>
</table>

### PERFORMANCE

| Seefeldt et al., 1972 | Wellman, 1937 | Seefeldt et al., 1972 | Wellman, 1937 |
| Wickstrom, 1970 | | | Wickstrom, 1970 |

The child catches the ball and demonstrates the following behaviors in two out of three trials:

a. holds arms bent at the elbows in front of the body,

b. uses hands in opposition to one another, i.e., a "clapping" motion, and attempts to trap ball.

The child catches the ball and demonstrates the following behaviors in two out of three trials:

a. holds arms bent at the elbows at the sides of body,

b. uses hands in a cupped fashion such that:

1. on throws above the waist the thumbs are nearly touching and
2. on throws below the waist the little fingers are close together.

The child catches the ball and demonstrates the following behaviors in two out of three trials:

a. holds arms bent at the elbows in front of the body,

b. uses hands in opposition to one another, i.e., a "clapping" motion, and attempts to trap ball.

The child catches the ball and demonstrates the following behaviors in two out of three trials:

a. holds arms bent at the elbows at the sides of body,

b. uses hands in a cupped fashion such that:

1. on throws above the waist the thumbs are nearly touching and
2. on throws below the waist the little fingers are close together.
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

ACTIVITY: CATCHING

LEVEL: I

Behavioral Objective: To track and scoop catch a balloon — when standing approximately 5 feet from the instructor, the child can track a balloon into his arms and perform a scoop catch without turning his head or leaning backwards (fear reaction) two out of three times.

Teaching-Learning Experiences:

1. Child watches a ball which is moving from near to far in front of him and attempts to touch or catch it.

2. Child watches a ball which is swinging from right to left at shoulder level and attempts to touch or catch it.

3. Child watches a ball which is swinging in a circle in front of him and attempts to touch or catch it.

4. Child watches a ball which is swinging in large circles around his body at shoulder level and attempts to touch or catch it.

* The ball used in the tracking activities should be 6-8 inches in diameter.

5. Child tracks and catches yarn balls, bean bags, etc. in large tin cans or buckets.

6. While sitting the child tracks and stops a rolling balloon with his hands.
   a. Rolling slightly right.
   b. Rolling slightly left.
   c. Rolling straight at him.

7. While sitting the child tracks a balloon and lets it roll up his arms (if possible child should squeeze balloon into his chest).

8. Same as number 6 above, except child is kneeling.

9. Same as number 7 above, except child is kneeling.

10. Child catches a balloon or yarn ball thrown directly into his arms.
CATCHING CONTINUED

Teaching-Learning Experiences: B.O. 11

11. Child keeps balloons in the air by batting them with his hands.
12. Child bats balloons continuously against wall.

The first four teaching-learning experiences can be found in:

Behavioral Objective: 

To catch using the hands and arms to scoop the ball into the body — When standing approximately 5 feet from the instructor, the child, using the hands and arms (bent at the elbows) to scoop or bring the ball into his body, catches the 6-8 inch ball thrown underhand two out of three times.

Teaching-Learning Experiences:

1. Child sits with legs spread and with assistance stops a balloon rolled to him by instructor.
   a. Child stops a rolling ball.

   Note: Instructor sits opposite child and holds one hand; he rolls the balloon/ball and grasps the child's other hand. Child stops balloon/ball with both hands.

2. Child sits with legs spread and independently stops a ball rolled to him by instructor.

3. Child sits with legs spread and feet touching the wall; he stops a ball with assistance which rebounds off the wall.

   Note: Instructor sits behind child and grasps his hands.

4. Same as above, child performs independently.

5. Child sits with legs spread; with his hands in a palms up position he receives a ball which rebounds off the wall and scoops it off the floor into his chest (with assistance).

6. Same as above, child performs independently.

7. Child sits with legs spread; with his hands in a palms up position he receives a bounced ball and scoops it into his chest.

8. Child sits with legs spread; with his hands in a palms up position he receives a tossed ball and scoops it into his chest.

9. Same as number 7, except child is kneeling.

10. Same as number 8, except child is kneeling.

11. Child stands approximately 5 feet from instructor; with his hands in a palms up position he receives a bounced ball and scoops it into his chest.

The activities listed above should utilize a playground ball approximately 6-8 inches in diameter.
ACTIVITY: CATCHING

LEVEL: III

Behavioral Objective:

To catch using only the hands — when standing approximately 5 feet from the instructor, the child, using only his hands, catches a 6-6 inch ball thrown underhand two out of three times.

Teaching-Learning Experiences:

1. Child sits with legs spread and catches a balloon rolled to him by the instructor.
2. Child kneels and catches a balloon rolled to him by the instructor.
3. Child sits with legs spread and catches a balloon tossed into his hands.
4. Child kneels and catches a balloon tossed into his hands.
5. Child stands and receives a controlled toss from the instructor (use a balloon).

Note: A controlled toss is a throw which is guided into the hands of the child by the instructor and which does not require a lot of adjustments on the part of the catcher.

6. Child kneels and catches a 6-6 inch ball tossed into his hands.
7. Child stands and receives a controlled toss with a 6-6 inch ball from the instructor.

a. Increase height and length of toss as child becomes better able to handle controlled toss.
b. For a change, bounce the ball.
Behavioral Objective:  

To catch with bent arms at sides and hands cupped—when standing approximately 10 feet from the instructor, the child, holding the arms bent at the elbows at the sides of body and using the hands in a cupped fashion such that on throws above the waist the thumbs are nearly touching and on throws below the waist the little fingers are close together, catches a 6-8 inch ball thrown underhand four out of six times. (Note: Half of the throws should be below waist level and half above chest level.)

Teaching-Learning Experiences:

1. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a yarn ball or bean bag.

2. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a yarn ball or bean bag.

3. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a 6-8 inch ball.

4. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a 6-8 inch ball.
   a. Start at 5 feet and gradually move out to 10 feet.

5. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a tennis ball.
   a. Start at 5 feet and gradually move out to 10 feet.
   b. Catch ball thrown slightly to the right.
   c. Catch ball thrown slightly to the left.

6. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a tennis ball.
   a. Start at 5 feet and gradually move out to 10 feet.
   b. Catch ball thrown slightly to the right.
   c. Catch ball thrown slightly to the left.

*Note:

a. Increase height and length of toss as child becomes better able to handle controlled toss.
b. For a change, bounce the ball.
CATCHING CONTINUED

Teaching-Learning Experiences: B.C. #1

A controlled toss is a throw which is guided into the hands of the child by the instructor and which does not require a lot of adjustment on the part of the catcher.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY NATURED CATCH

1. Throw and catch off wall.
2. Throw to a pitch-back device and catch rebound.
3. Play catch.
4. Catch with scoops (bleach bottles), tin cans (of various sizes), baseball glove.
5. Stretch rope(s) 5-6 feet off ground, child throws ball over rope and runs to other side to catch it.
   a. Increase height of rope.
   b. Gradually increase distance from side to side.
6. Catches with one hand.
7. Catches while running.
   a. Runs right.
   b. Runs left.
   c. Runs forward.
   d. Runs backward.
APPENDIX F

TEST-RETEST RELIABILITY RESULTS-
SCOTT'S Pi
TABLE 14

Scott's Pi Test-Test Inter-Judge Reliability
Coefficients for Walking

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Scott's Pi Test-Retest Inter-Judge Reliability Coefficients for Running

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### TABLE 20
Scott's Pi Test-Retest Inter-Judge Reliability Coefficients for Kicking

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**Notation:**
- $a_{Md} = 0.18$
- $b_{Md} = 0.41$
### TABLE 21
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TABLE 22

Scott's Pi Test-Retest Inter-Judge Reliability

Coefficients for Skipping

^a Md = 0.58
^b Md = 0.67
### TABLE 23

**Scott's Pi Test-Retest Inter-Judge Reliability Coefficients for Ladder Climbing**

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\( a \) m = 1.00

\( b \) \( m = 1.00 \)
**TABLE 24**

Scott's Pi Test-Retest Inter-Judge Reliability Coefficients for Stair Climbing

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<sup>a</sup> k = 1.00

<sup>b</sup> k = 0.87
APPENDIX G

REVISED O.S.U. PERFORMANCE-BASED CURRICULUM
Behavioral Objective: #1

To pull to an upright kneeling position from sitting back on legs--When sitting on the back of the legs with knees and lower legs on the ground, hands on the floor in front of him and within reach of either the instructor or a chair, the child will pull himself to an upright kneeling position on every occasion. (Instructor may assist by taking child's hands, but should not help by pulling him up.)

Teaching-Learning Experiences:

1. Place child over a large bolster or rolled mat. Guide him into kneeling with your hands on his legs (hands are placed at or slightly below the knee joint) as you pull him back towards the floor.

2. Place child in an all 4's position and with your hands on his hips bring him to sitting back on his legs. (Caution: Check to be sure that his feet are turned inward rather than outward.) From this position bring him to an upright kneeling position.

3. While in the sitting position and then in the semi-kneeling or sitting back on the legs position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.
   a. Push forward and backward also.

4. Place child in an all 4's position with a chair in front of him. Encourage child to sit back on legs and then pull up on the rungs of the chair until an upright kneeling position is achieved.

Behavioral Objective: #2

To raise trunk to an upright kneeling position straight from all 4's--When in an all 4's position and within reach of either the instructor or a chair, the child will pull his trunk to an upright kneeling position two out of three times. (Instructor may assist by taking child's hands.)

Teaching-Learning Experiences:

1. Place child in such a position that he is sitting back on his legs, hands on the floor in front of him. From this position have him pull himself to an upright kneeling position with assistance from a rope, wand, chair, etc.
Teaching-Learning Experiences: Level I, B.O. #2

2. While in the upright kneeling position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.
   a. Initially, child holds onto a chair.
   b. Child holds onto a wand/stick instead of chair.
   c. Child is able to balance without assistance.

3. Repeat #2 pushing forward and backward.

Behavioral Objective: #3

To pull to standing from half-kneeling—When in a full kneeling position in front of a bench, rail, etc., the child will bring one leg forward into a half-kneeling position and from there pull up to standing two out of three times.

Teaching-Learning Experiences:

1. Place child in kneeling position in front of a chair, bench, etc. Take one of his thighs in your hand and lift one leg to place child in a half-kneeling position. Push in on his buttocks firmly and gently lift him to a standing position.

2. While in the half-kneeling position, gently push the child to one side or the other at shoulder level and see if he can maintain his balance.
   a. Initially, child holds onto a chair.
   b. Child holds onto a wand/stick instead of chair.
   c. Child is able to balance without assistance.

3. Repeat #2 pushing forward and backward.

4. To return to half-kneeling from standing, take hold of the child's leg and gently bending his leg bring him back to a half-kneeling position.

   Note: Take a position behind the child and be ready to use the shoulder or body to provide stability for the child while he is being guided back to half-kneeling.

Behavioral Objective: #4

To maintain an erect standing posture assisted or unassisted for 10 seconds—After having pulled to a standing position, the child will maintain an erect standing posture either assisted or unassisted for a minimum of 10 seconds two out of three times.
Teaching-Learning Experiences: Level I, B.O. #4

1. Have the child standing and leaning with his back against a wall for increasingly longer periods of time up to 10 seconds.

2. Have the child standing and holding onto a rail, bench, etc. at waist level and have him maintain his balance for increasingly longer periods of time up to 10 seconds.

3. Have the child standing and holding onto either someone's hands or a stick/rope with both hands and have him maintain his balance for increasingly longer periods of time up to 10 seconds.

4. Have the child standing and holding onto either someone's hand or a stick/rope with one hand, and have him maintain his balance for increasingly longer periods of time up to 10 seconds.

5. Have the child standing and within arms reach of a wall, rail, bench, etc., and have him maintain his balance with only periodic assistance from support objects for increasingly longer periods of time up to 10 seconds.
Behavioral Objective: #1

To cruise or walk sideways leading with the same leg for a distance of five feet—When standing at one end of a bench, rail, etc. along which he can move while holding on, the child will cruise or walk sideways always leading with the same leg for a distance of at least 5 feet on every occasion.

Teaching-Learning Experiences:

1. Child pulls his trunk to an upright kneeling position from all 4's position.

2. Child pulls to standing from half-kneeling position.

3. Child maintains erect standing posture with support for 10 seconds initially then progress to 20-30, etc. seconds.

4. Place child at the end of a bench, rail, etc. with your hands on his hips for support. Guide him in a sideways movement along the edge while he holds onto it with his hands. Do not permit him to cross his legs or to rotate his body so that he is walking forward.

5. Child cruises while holding onto a rod which the instructor is holding. (Instructor is causing the movement to occur.)

6. Child cruises and steps over objects.

7. Child is encouraged to cruise from one support surface to another, thereby, developing independent standing and stepping.
P.B.C. ACTIVITY: WALKING

LEVEL: III

Behavioral Objective: #1

To assume a standing position independently—when in a half-kneeling position and away from surrounding support objects, the child independently assumes a standing position two out of three times.

Teaching-Learning Experiences:

1. Place child in an upright kneeling position with a chair, etc. in front of him and encourage him to stand and then push a chair, cart, box, etc. across the room.

2. Child holds onto an object like a piece of rope, towel, or instructor's hand and is assisted to a standing position at which point the instructor releases support object.

3. Have child stand independently to get a favored object which is held above his head and out of arms reach.

Behavioral Objective: #2

To walk forward by alternating the feet at least 10 steps with partial support—after assuming a standing position independently, the child walks forward by alternating the feet for at least ten (10) steps; except for touching a support object once, the performance is independent. (Characteristic of this walk involves the arms raised to the sides at approximately shoulder level and feet spread no wider than shoulder width.)

Teaching-Learning Experiences:


2. Start the child cruising and encourage him to take a few steps away from whatever he is holding onto. This can be done by offering him your hand and helping him to take steps holding on with only one hand.

3. Holding the child at the hips from behind, guide him in a walking pattern.

4. Child walks and pushes a chair, cart, box, etc. across the room.

5. Child walks between parallel bars and uses both arms for support.

6. Child walks with one hand on a stationary rail (one of the parallel bars) and the other hand on a dowel/rope, etc. held by instructor.
Teaching-Learning Experiences: Level III, B.O. #2

7. Child walks holding onto one rail, dowel/rope, etc.

8. Child walks with only periodic touches of support objects like the wall, rail, bench, etc.

9. Place child with his back against the wall and encourage him to take a few steps toward you.
P.B.C. ACTIVITY: WALKING

LEVEL: IV

Behavioral Objective: #1

To walk forward totally unassisted for at least 15 feet with arms alternating in opposition to legs—After assuming a standing position independently, the child walks forward totally unassisted with the arms alternating in opposition to legs, i.e., right arm and left leg swing forward together and vice versa, in a straight line for a distance of fifteen (15) feet two out of three times.

Teaching-Learning Experiences:

1. Child walks forward totally unassisted with arms raised to approximately shoulder level and feet spread wide for a steadily increasing number of steps, e.g., 12-16-20.

2. Child either creeps on all 4's or walks on his hands and feet, like bear walking. (Either movement is done in an alternating pattern, i.e., right leg and left arm move forward at the same time and vice versa.)

3. With the instructor holding a stick, dowel, or wand in each hand and facing the child who is also holding onto the objects, the child walks and instructor pulls the stick opposite the stepping foot thereby causing the child to alternate arms in opposition to the legs.

4. Place like colored ribbons, etc. on the opposite foot and arm. Have child match colors, e.g., red ribbon on right arm and left leg would be forward simultaneously.
1. Walk around objects.

2. Walk sideways and then backwards.

3. Vary width of paths and/or have them change directions, e.g., follows a 10' path with 90 degree turns.
   a. Walks straddling a line which changes direction.

4. Walks patterns on the floor, e.g., footprints, squares, etc.

5. Walks with various arm and body positions, e.g., animal walks like dog, bear, etc.

6. Walks balancing various objects, e.g., bean bag on head, wand held vertically in hand.

7. Walks rope obstacle course which includes walking along ropes and stepping over ropes at different heights.

8. Walks up and down inclines.

9. Walks on walking board, balance beam.

10. Walks using giant steps and then baby steps.

11. Walks using high steps and then low steps.

12. Uses feet in different ways, such as: tiptoes, toes in, toes out, on heels, etc.

13. Walks to rhythmic accompaniment, i.e., rhythm instruments and/or records.
   a. Stand and mark drum beats with feet.
   b. Walk to the drum beat.
   c. Walk on tiptoes with records.

14. Walk using small equipment such as tapping a balloon.
Behavioral Objective: #1

To increase walking speed for a distance of 20 feet—The child will walk independently with a pace that exceeds his normal walking speed for a distance of 20 feet two out of three times.

Teaching-Learning Experiences:

1. Instructor standing behind the child and holding onto his shirt at the shoulders guides him into a fast walking pace which exceeds his normal walking speed.

   Note: Another technique to facilitate running is the wrapping of a towel or rope across the front of the chest and under the arms and gathering it behind the head; this then becomes the mechanism for guiding the child.

2. Instructor faces child and grasps both of his hands; instructor then walks quickly backwards and guides child into a fast walking pace which exceeds his normal walking speed.

3. Instructor grasps one of child's hands and guides him into a fast walking pace.
   a. Child holds onto a rope, wand, etc. and is guided by instructor into a fast walking pace.

4. Child imitates instructor who walks with a pace that exceeds his normal walking speed.

5. Instructor and child play flag tag at a fast walking pace.

   Note: Strips of cloth, handkerchief, etc. tucked in the pants or belt can act as flags.
Behavioral Objective: #1

To develop alternate arm action—While standing still, the child independently moves the arms, held at approximately right angles and swinging with large movements forward and backward along side the body, in opposition three out of five times.

Teaching-Learning Experiences:

1. Instructor stands behind child and physically alternates arms.

2. Instructor stands behind child who is holding a wand/stick in each hand. The instructor who is also holding the wand/stick pushes in an alternating fashion thereby facilitating opposition. Encourage child to hold arms at right angles.
   a. May wish to use ribbon of same color on right arm-left leg to further facilitate opposition action.

3. Using a marching tune have child march in place alternating arms and legs in opposition.
   a. Move to marching around room as child demonstrates opposition control during stationary marching.

Behavioral Objective: #2

To develop a narrow base of support—The child will walk independently with a fast walking pace as if attempting to run and will stay within the boundaries of a path 20 feet long and only 18 inches wide while moving the arms, held at approximately right angles and swinging with large movements forward and backward along side of body two out of three times.

Teaching-Learning Experiences:

1. Using ropes, wands, or lines on floor as boundaries have child walk between them, gradually decreasing distance between boundaries.
   a. Gradually increase rate of walk until running is achieved.

2. Use footprints, etc. to narrow the base of support, i.e., feet begin to fall closer and closer together as well as to lengthen the stride.

Behavioral Objective: #3

To imitate a slow run or jog—The child independently attempts to run by changing from a fast walking pace into a slow run or jog for a distance of 20 feet two out of three times.
Teaching-Learning Experiences: Level II, B.O. #3

1. Instructor standing behind the child and holding onto his shirt at the shoulders guides him into a fast walking pace which exceeds his normal walking speed.

   Note: Another technique to facilitate running is the wrapping of a towel or rope across the front of the chest and under the arms and gathering it behind the head; this then becomes the mechanism for guiding the child.

2. Child imitates instructor who walks with a pace that exceeds his normal walking speed.

3. Instructor and child play flag tag at a fast walking pace.

   Note: Strips of cloth tucked in the pants or belt can act as flags.
Behavioral Objective: #1

To move arms and legs in opposition—While running a distance of approximately 20 feet, the child independently moves the arms, held at approximately right angles and swinging with large movements forward and backward along side of body, in opposition to the legs four out of five times.

Teaching-Learning Experiences:

1. Instructor stands behind child and physically alternates arms.

2. Instructor stands behind child who is holding a wand/stick in each hand. The instructor who is also holding the wand/stick pushes in an alternating fashion thereby facilitating opposition.

Behavioral Objective: #2

To maintain knee of swinging leg under body—While running a distance of approximately 20 feet, the child independently swings the legs so that the knees remain under the hips two out of three times.

Teaching-Learning Experiences:

1. Child imitates the pedaling of a bicycle while lying on his back.

   Note: Passively move legs through movement then let child perform independently.

   a. Perform to music.

2. Child imitates instructor who performs running movement very slowly—knee of swinging leg passes under the hips (body).

   Note: Instructor can physically prevent knee from swinging out to side of body.

Behavioral Objective: #3

To leap two consecutive steps—The child independently leaps two consecutive steps by alternating take off and landing feet, i.e., take off on right, land and take off on left, land and take off on right two out of three times without falling.
Teaching-Learning Experiences: Level III, B.O. #3

1. Child jumps down from one foot to both feet from a height of approximately 8 inches without falling.

   Note: There is a period of total non-support.

2. Child jumps from one foot to both feet from a height of approximately 8 inches into a hoop which is placed at the previous point of landing and is steadily moved away (inches at a time).

3. Child leaps one step.

4. Child leaps by taking large steps onto footprints with two hand support.
   a. May use objects or lines in place of footprints.
   b. Move from two hand support to one hand as soon as possible.
Behavioral Objective: #1

To leap 3 or more consecutive steps—The child independently leaps 3 or more consecutive steps by alternating take off and landing feet, i.e., take off on right, land and take off on left, land and take off on right, etc. two out of three times without falling.

Teaching-Learning Experiences:

1. Child leaps into and out of hoops, tires, boxes, etc.

Note: These can be arranged in any design and using any number, e.g., a straight line of 3 tires or a circle of 10 hoops.

Behavioral Objective: #2

To demonstrate a mature run for approximately 25 feet—While running a straight course of approximately 25 feet, the child independently demonstrates: arm and leg opposition, movement of heel of forward swinging leg close to buttock with associated elevation of thigh to approximately waist level, and an observable period of total non-support, on every occasion.

Teaching-Learning Experiences:

1. Run with tiny, fast steps.

2. Run with giant strides.

3. Run with high knee action.

4. Run over objects, e.g., wands/sticks laid across the intended path and spread far enough apart to conform to the child's running stride.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY MATURE RUN

1. Run around objects, e.g., in and out of markers.
2. Run varying speeds.
3. Run backwards.
4. Run as lightly as possible.
5. Run bouncing as high as you can.
6. Mix in giant steps with your run.
7. Run with a high stepping movement, i.e., high knee action.
8. Run with exaggerated arm movements, i.e., larger than normal arm swings.
9. Stop change direction and/or speed in response to an outside signal.
10. Run on tiptoes, heels, etc.
11. Run forward \( \frac{1}{2} \) way and backward the rest.
   a. Run backward \( \frac{1}{2} \) way and then forward.
12. Run across the room, turn around (right) completely and continue across.
   a. Same but turn left.
13. Run to rhythmic accompaniment, i.e., rhythm instruments and/or records.
   a. Run in place to drum beat.
   b. Run to drum beat.
   c. Run on tiptoes to record.
Behavioral Objective: #1

To climb up and down one step of a ladder—When standing in front of and touching a ladder, the child, using any method at all, independently climbs up and down one step of a ladder two out of three times.

Teaching-Learning Experiences:

1. Child climbs onto a mat which is built up to waist level.

2. Child climbs on and off an adult size chair.

3. Child climbs out of a stack of tires, corresponding to a height which equals the child's shoulder level. (Instructor should hold tires while child attempts task.)

4. Child steps up on a 12" high mat while grasping a wand held parallel to floor by instructor.
   a. Progress to using 12" high block.

5. Child steps backwards off a bench approximately 12" high while grasping a wand held parallel to floor by instructor.

6. Child steps on and off a balance beam approximately 8"-12" high from the side while grasping a wand held parallel to floor by instructor.
Behavioral Objective: #1

To climb up and down three to five steps using a two foot landing on each rung—When standing in front of and touching a ladder, the child, using a two foot landing on each rung, climbs up and down three to five steps two out of three times.

Teaching-Learning Experiences:

1. Child climbs up and backs down an inclined board while in the hands and feet position. (Bear Walking position.)

2. Child walks forward and backward in the hands and feet position on a bench approximately 12" wide.

3. Child walks the side rails of a ladder, which is lying flat on the floor, in the hands and feet position.

4. Child walks the rungs of a ladder, which is lying flat on the floor, in the hands and feet position.

5. Child walks the side rails of a ladder, which is raised first to 2' and then to 4' at one end, in the hands and feet position.

6. Child walks the rungs of a ladder, which is raised first to 2' and then to 4' at one end, in the hands and feet position.

*Allow child to determine stepping pattern. However, if child hesitates with task, encourage a "mark time" pattern, i.e., two foot landing on each rung.

Note: Encourage child to use any available sliding apparatus in the gymnasium, classroom, playground, etc.
P.B.C. ACTIVITY:  LADDER CLIMBING
LEVEL:  III

Behavioral Objective:  #1

To climb up three to five steps using an alternate stepping pattern and down using a two foot landing on each rung—When standing in front of and touching a ladder, the child, using alternate stepping pattern to ascend and a two foot landing on each rung to descend, climbs up and down 3 to 5 steps two out of three times.

Teaching-Learning Experiences:

1. Child climbs up and backs down an inclined board using an alternate foot pattern while in the hands and feet position.

2. Child walks forward and backward in the hands and feet position on a bench approximately 12" wide using an alternate foot pattern.

3. Child is assisted into an alternate foot pattern while walking the rungs of a ladder which is 1/2' off the ground at one end.

4. Child climbs a ladder which is 1/2' off the ground at one end and which is covered with a piece of canvas (to prevent the child from falling through) using an alternate stepping pattern.

5. Child independently climbs a ladder which is 1/2' off the ground at one end using an alternate stepping pattern.
Behavioral Objective: #1

To climb up and down three to five steps using an alternate stepping pattern—When standing in front of and touching a ladder, the child, using an alternate stepping pattern, climbs up and down 3 to 5 steps two out of three times.

Teaching-Learning Experiences:

1. Child is assisted into an alternate stepping pattern while descending the ladder which is positioned according to the suggested principle, i.e., for every foot the ladder is long, move the base of the ladder 6" away from the wall.

   For example, the base of a 10' ladder is 5' from the wall.
1. Sliding boards.
2. Cargo nets.
3. Stall bars.
4. Lind climbers.
5. Rope ladders.
6. Outdoor areas with steep, hilly areas.
PROGRAMS FOR INDIVIDUALS IN PHYSICAL EDUCATION

P.B.C. ACTIVITY: STAIR CLIMBING

LEVEL: I

Behavioral Objective: #1

To climb up and down a series of 5 steps (maximum 8" high) in a manner other than walking—When positioned at the bottom of a series of five (5) steps (maximum 8" high), the child ascends by creeping or walking on hands and feet and descends by sliding from step to step on the buttock or backing down in a hands and feet position two out of three times.

Teaching-Learning Experiences:

1. Child creeps over objects laid in his path, e.g., sticks, wands, ropes, etc.

2. Child creeps up and down or creeps up and slides down an inclined board, at least 2' wide.

   Note: Incline can be adjusted to eventually approximate the angle of a flight of steps. Initially, incline should be approximately 8 to 10 feet in length and angled slightly.

3. Child creeps up and down or creeps up and slides down a series of steps constructed from mats. (Activity desirable if fold away mats are available.)

   Note: Height of step should be less than 5 inches initially.

4. Same as T.L. #1 above except child executes task in hands and feet position.

5. Same as T.L. #2 above except child executes task in hands and feet position.
Behavioral Objective: #1

To ascend a series of 5 steps (maximum 8" high) using a two foot landing (mark-time pattern) - when standing at the bottom of a series of five (5) steps (maximum 8" high), the child, with or without the aid of the railing or wall, walks up using a two foot landing (mark-time pattern) two out of three times.

Teaching-Learning Experiences:

1. Child steps over objects, e.g., sticks, wands, ropes, etc. which are held at different heights.

2. Child walks up one step constructed from a mat(s) with assistance from a railing or wall.
   a. Height of step should increase gradually from approximately 2 to 6 inches.
   b. Number of steps should increase gradually from 1 to 4. (Activity desirable if fold away mats are available.)
   c. Gradually decrease assistance until child can walk unassisted.

Note: A possible technique to facilitate stepping up onto the mat is stepping over a wand or stick held at mat level.

3. Child walks up incline board at least 2' wide with assistance from instructor or wall.

4. Child walks up one (then 2, 3, 4) step(s) of normal size (8") with assistance from a railing or wall.

Behavioral Objective: #2

To descend a series of 5 steps (maximum 8" high) using a two foot landing (mark-time pattern) - when standing at the top of a series of five (5) steps (maximum 8" high), the child, with or without the aid of the railing or wall, walks down using a two foot landing (mark-time pattern) two out of three times.

Teaching-Learning Experiences:

1. Child steps up on and walks down an incline which is approximately 4" high and 6' long.

2. Child steps off a single level object like a mat, toy block, etc.
   a. Height of object should increase gradually from approximately 2 to 8 inches.
Teaching-Learning Experiences: Level II, B.O. #2

3. Child steps off one step constructed from a mat(s) with assistance from a railing or wall.
   a. Height of step should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 1 to 4. (Activity desirable if fold away mats are available.)
   c. Gradually decrease assistance until child can walk unassisted.

4. Child walks down incline board at least 2' wide with assistance from instructor or wall.

5. Child walks down one (then 2, 3, 4) steps of normal size (8") with assistance from a railing or wall.
Behavioral Objective: #1

To ascend a series of 5 steps (maximum 8" high) using an alternate stepping pattern with assistance—When standing at the bottom of a series of five (5) steps (maximum 8" high), the child, with the aid of the railing or wall, walks up using an alternate stepping pattern two out of three times.

Teaching-Learning Experiences:

1. Child walks on footprints without touching the floor between steps.

2. Using an alternate stepping pattern, the child walks on footprints and steps over elevated sticks or wands which are approximately 4" off the floor.
   a. Initially use ladder flat on floor and gradually elevate.

3. Same as above without footprints.

4. Child walks up two steps constructed from mats with assistance from a railing or wall.
   a. Height of step should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 2 to 4.
   c. Gradually decrease assistance until child can walk unassisted.

5. Child walks up two (then 3, 4) steps of normal size (8") with assistance from a railing or wall.

Behavioral Objective: #2

To descend a series of 5 steps (maximum 8" high) using an alternate stepping pattern with assistance—When standing at the top of a series of 5 steps (maximum 8" high), the child, with the aid of the railing or wall, walks down using an alternate stepping pattern two out of three times.

Teaching-Learning Experiences:

1. Child steps up on and walks down an incline which is approximately 8" high and 6' long.

2. Child walks down two steps constructed from mats with assistance from a railing or wall.
Teaching-Learning Experiences: Level III, B.O. #2, T.L. #2

a. Height of steps should increase gradually from approximately 2 to 8 inches.

b. Number of steps should increase gradually from 2 to 4. (Activity desirable if fold away mats are available.)

c. Gradually decrease assistance until child can walk unassisted.

3. Child walks down two (then 3, 4) steps of normal size (8") with assistance from a railing or wall.
Behavioral Objective: #1

To independently ascend a series of 5 steps (maximum 8" high) using an alternate stepping pattern—When standing at the bottom of a series of five (5) steps (maximum 8" high), the child, without any assistance, walks up using an alternate stepping pattern two out of three times.

Teaching-Learning Experiences:

1. Using an alternate stepping pattern, the child steps over elevated sticks or wands which are approximately 8" off the ground.

2. Child independently walks up two steps constructed from mats. (Use footprints initially.)
   a. Height of steps should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 2 to 4.
      (Activity desirable if fold away mats are available.)
   c. Gradually decrease assistance until child can walk unassisted.

3. Child independently walks up two (then 3,4) steps of normal size (8"). (Use footprints initially.)

Behavioral Objective: #2

To independently descend a series of 5 steps (maximum 8" high) using an alternate stepping pattern—When standing at the top of a series of five (5) steps (maximum 8" high), the child, without any assistance, walks down using an alternate stepping pattern two out of three times.

Teaching-Learning Experiences:

1. Child steps up on and walks down an incline which is approximately 12" high and 6' long. (Use footprints initially.)

2. Child independently walks down two steps constructed from mats.
   a. Height of steps should increase gradually from approximately 2 to 8 inches.
   b. Number of steps should increase gradually from 2 to 4.
      (Activity desirable if fold away mats are available.)
   c. Gradually decrease assistance until child can walk unassisted.

3. Child independently walks down two (then 3,4) steps of normal size (8"). (Use footprints initially.)
1. Runs to the top of a series of 3 steps constructed from mats and
jumps off.

2. Runs up one side of a series of 3 steps constructed from mats and
down the other side.

3. With approximately 8" blocks arranged in a series, the child steps
on the blocks as follows.
   a. Child steps with either foot.
   b. Child steps only with right foot.
   c. Child steps only with left foot.
   d. Child alternates feet.

   Note: Space between blocks must be greater to allow for
two steps.

4. Lind Climber activities:
   a. Single bar- step up
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
   b. Double bar- stair step effect
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
   c. Triple bar- stair step effect
      (1) Dismount by leaping from one foot.
      (2) Dismount by jumping from both feet.
Behavioral Objective: #1

To gallop a distance of approximately 25'—When standing and facing the instructor who is approximately 25 feet in front of him, the child gallops, i.e., combination of walk and leap, in the direction of the instructor without support two out of three times.

Teaching-Learning Experiences:

1. Child stands with preferred foot well ahead of the other foot and on a footprint or the outline of a footprint on the floor; he then slides rear foot to a position behind the lead foot.

2. Child takes a single step with preferred foot onto a footprint or the outline of a footprint on the floor; he then slides rear foot to a position behind the lead foot.

3. Child takes a single step with preferred foot (no visual cues), and then slides the rear foot to a position behind the lead foot.

4. Child performs several step-slide movements.
   a. Footprints or the outline of footprints on the floor may be useful initially.

5. Child performs several step-slide movements to music or rhythmic accompaniment.

6. Repeat experiences #1–#5 with non-preferred foot.
Behavioral Objective: #1

To skip consecutively once on each foot—When standing and facing the instructor who is approximately 2.5 feet in front of him, the child skips consecutively once on each foot in the direction of the instructor without support two out of three times.

Teaching-Learning Experiences:

1. Child hops in place 2 or more times consecutively first on the right foot and then on the left foot.

2. Child takes one step up to a rope or a line on the floor, etc. and hops over with lead foot.
   a. Reverse lead foot.

3. Child steps and hops—no visual cues like a rope or a line.
   a. Reverse lead foot.

4. With four ropes evenly spaced apart on the ground, the child steps over the first rope with lead leg and then hops over the second rope with lead leg; then he steps over the third rope with opposite leg and then hops over the fourth rope with same leg.
   Note: Suggest starting with a constant distance of 8" between ropes.

5. Child takes one step and hops with lead foot followed by a step and hop on the opposite foot—no visual cues.

6. While walking, child steps and hops once on each foot in succession.
   Note: Movement can be performed to music or rhythmic accompaniment, e.g., clapping hands, rhythm sticks, tambourines, records.
Behavioral Objective: #1

To skip alternately twice on each foot—When standing and facing the instructor who is approximately 25 feet in front of him, the child, without support, alternately skips twice on each foot in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child hops rhythmically in place alternating feet.
   a. Hop once on right and left.
   b. Hop twice on right and left.
   c. Hop twice on right and once on left.
   d. Hop once on right and twice on left.

2. With four ropes evenly spaced apart on the ground, the child steps over the first rope with lead leg and then hops over the second rope with lead leg; then he steps over the third rope with opposite leg and then hops over the fourth rope with same leg, etc. repeat pattern as needed for additional ropes.
   a. Add four or more ropes or lines gradually until child is stepping and hopping 3 to 4 times in succession.

Note: Suggest starting with a constant distance of 8" between ropes.

3. While walking and alternating feet on each step, the child steps and hops at least 4 steps in succession.
P.B.C. ACTIVITY: SKIPPING

LEVEL: IV

Behavioral Objective: #1

To skip consecutively while alternating feet for a distance of approximately 25 feet—When standing and facing the instructor who is approximately 25 feet in front of him, the child skips consecutively in the direction of the instructor for a distance of approximately 25 feet without support while alternating feet two out of three times.

Teaching-Learning Experiences:

1. With four ropes evenly spaced apart on the ground, the child steps over the first rope with lead leg and then hops over the second rope with lead leg; then he steps over the third rope with opposite leg and then hops over the fourth rope with same leg, etc. repeat pattern as needed for additional ropes.

   a. Add 8 ropes or lines gradually until child is stepping and hopping 4 to 6 times in succession.

   Note: Suggest starting with a constant distance of 8" between ropes.

2. While walking and alternating feet on each step, the child steps and hops a least 8 steps in succession.

3. Child skips to music or rhythmic accompaniment, i.e., clapping hands, rhythm sticks, tambourines, records.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY MATURE SKIP

1. Skip forward, in a big circle, on a diagonal.
2. Skip backward.
3. Skip varying speed, fast or slow.
4. Skip while dribbling a ball.
5. Change from a skip to a gallop or vice versa.
   a. Skip to run.
   b. Skip to walk.
P.B.C. ACTIVITY: HOPPING

LEVEL: I

Behavioral Objective: #1

To jump on 2 feet at least 3 consecutive times—When in a standing position with feet parallel and next to each other, the child, using a simultaneous two foot take off and landing, independently jumps forward in a broad jump fashion at least three consecutive times two out of three times.

Teaching-Learning Experiences:

1. Child imitates instructor who crouches and rises on her toes—child holds teacher's hands.
   a. Child performs independently.

2. Child bounces on mini-trampoline 5 consecutive times while holding teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive times while supported by a stick, rope, towel, etc. held by instructor.

3. Child jumps from a mat approximately 8" high into a hoop, etc. which is placed just beyond the spot where the child would land if he stepped down. The hoop, etc. can be gradually moved further away.

4. Stationary jump with two hand support from instructor.
   a. Reduce support to one hand, to wand, to rope.
   b. Child performs independently.

5. Child jumps forward holding the teacher's hands.
   a. Jumps forward holding one hand.
   b. Jumps forward holding an object like a stick/wand, etc.
   c. Jumps forward independently.

6. Child independently jumps forward and over a low object, e.g., rope, line, etc.
   a. Add two or more objects to encourage consecutive jumping.
P.B.C. ACTIVITY: HOPPING  
LEVEL: II

Behavioral Objective: #1

To balance on 1 foot for 3-5 seconds—When in a standing position supported on one leg and with the bent non-support leg held in front of the body and a few inches above the floor, the child maintains his balance on one foot for three to five seconds two out of three times.

Teaching-Learning Experiences:

1. Child steps over obstacles laid in his path, e.g., wands, sticks, even the rungs of a ladder.
   a. Increase height of obstacles gradually.
   b. Eventually, child should walk in an alternating pattern.

2. Child steps in and out of a series of tires.

3. Child steps on and attempts to burst balloons.

4. Child walks a 2 inch line with heel-toe progression.

5. Child maintains a one foot static balance position for increasingly longer periods of time with assistance from instructor initially.
   a. Child holds teacher's hands.
   b. Child holds onto a wand with both hands—progress to holding rope.
   c. Child holds teacher's hand.
   d. Child holds onto a wand with one hand—progress to holding rope.
   e. Child independently executes one foot stationary balance for one, two, three seconds, etc.

*Assistance can be lessened as child becomes more confident of balance.
Behavioral Objective: #1

To hop forward on 1 foot at least 1 time--When in a standing position supported on one leg and with the bent non-support leg held in front of the body and a few inches above the floor, the child hops forward on one foot at least once two out of three times.

Teaching-Learning Experiences:

1. Child imitates instructor who rises on her toe while in a one-foot static balance-child holds teacher's hands.
   a. Child performs independently.

2. Child bounces on one foot on the mini-trampoline 5 consecutive times while holding teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive times while supported by a stick held by instructor.

3. Child hops in place 1-2 times.

4. Child hops forward over lines, ropes, etc. on one foot at least one step with assistance from the instructor initially.
   a. Child holds teacher's hands.
   b. Child holds onto a wand with both hands.
   c. Child holds teacher's hand.
   d. Child holds onto a wand with one hand.
   e. Child executes hop independently.

5. Child hops forward (no visual cues like lines or ropes, etc.) on one foot at least one step with assistance from the instructor initially.
   a. 
   b. 
   c. Same as #3 above.
   d. 
   e. 

#Assistance can be lessened as child becomes more confident and skillful.
Behavioral Objective: #1

To hop forward on 1 foot at least 3 consecutive times—When in a standing position supported on one leg and with the bent non-support leg held a few inches above the floor and in front of the body, the child hops forward on one foot at least three consecutive times by swinging arms forward and upward to aid in lifting the body; lifting bent nonsupport leg upward simultaneously with arm swing, and straightening support leg to lift body off floor two out of three times.

Teaching-Learning Experiences:

1. Child hops in place. (Encourage child to keep arms away from body to permit free swinging action.)
   a. Hop 1, 2, 3, 4 times, etc. on right foot.
   b. Same on left foot.
   c. Hop once on right and once on left.
   d. Hop twice on right and twice on left.

* Attempt to do in a continuing pattern.

2. Child hops forward on one foot. (Encourage child to keep arms away from body to permit free swinging action.)
   a. Right foot only.
   b. Left foot only.
   c. Hop and make $\frac{1}{4}$ turn. Repeat until full turn is accomplished.

*3. Child hops forward over lines, ropes, etc. on one foot at least two steps with assistance from the instructor initially.
   a. Child holds teacher’s hands.
   b. Child holds onto a wand with both hands.
   c. Child holds teacher’s hand.
   d. Child holds onto a wand with one hand.
   e. Child executes hop independently.

*4. Child hops forward (no visual cues like lines or ropes, etc.) on one foot at least two steps with assistance from the instructor initially.
   a.
   b.
   c. Same as #3 above.
   d.
   e.

* Assistance can be lessened as child becomes more confident and skillful.
1. Hop forward over a series of lines.
2. Hop forward and backward over a line.
3. Hop varying the speed, fast or slow.
4. Hop varying height and length.
5. Hop sideward (right and left) and diagonally over a line.
6. Hop sideward.
   a. Move to left on left leg then on right.
   b. Move to right on right leg then on left.
7. Hop over objects.
8. Hop on lines; then on walking board.
9. Hop on inner tube with one foot.
10. Hop in and out of various patterns and designs on the floor.
11. Hop with eyes closed.
12. Play hopscotch.
P.B.C. ACTIVITY: JUMPING

LEVEL: I

Behavioral Objective: #1

To jump down from an object or step approximately 8" high using a two foot take off and landing—When in a standing position on the edge of an object or step approximately eight (8) inches high, the child, using a simultaneous two foot take off and landing, independently jumps down without falling two out of three times.

Teaching-Learning Experiences:

*1. Child steps down on one foot and then the other foot from a height of approximately 8" without falling.

*2. Child leaps down from one foot to the other foot from a height of approximately 8" without falling.

*3. Child jumps down with one foot leading and landing on both feet from a height of approximately 8" without falling.

*4. Child jumps down using a two foot take off and landing from a height of approximately 2" (thickness of a single mat) without falling.

   a. Gradually increase thickness of mat until 8" jump is accomplished.

   *In each case the instructor may initially assist child.
Behavioral Objective: #1

To develop horizontal jumping for distance, i.e., 8-12 inches—
The child, using a two foot take off, jumps forward 8-12 inches two
out of three times.

Teaching-Learning Experiences:

1. Review Level I teaching-learning experiences—height increases
   8-12 inches.

2. Child imitates instructor who crouches and rises on her
toes—child holds teacher's hands.
   a. Child performs independently.

3. Child bounces on mini-trampoline 5 consecutive times while
   holding teacher's hands.
   a. Child bounces on mini-trampoline 5-10 consecutive
times while supported by a stick held by instructor.

4. Child independently jumps in place once, then several times.

5. Child jumps from a mat approximately 8" high into a circle
   made of rope, etc. which is placed just beyond the spot where
   the child would land if he stepped down. The rope, etc. can
   be gradually moved further away.

6. Child jumps forward over painted lines on the floor, rope(s),
etc.
   a. Child holds both hands of teacher.
   b. Child holds onto a wand with both hands.
   c. Child holds one hand of teacher.
   d. Child holds onto a wand with one hand.
   e. Child jumps independently.
Behavioral Objective: #1

To develop rhythmical coordination of arms and legs while in a stationary standing position—While standing with his arms at his sides and in a stationary standing position, the child swings his arms backward while bending his knees and then swings his arms forward to at least head level while straightening his knees (stretch body) two out of three times.

Teaching-Learning Experiences:

1. Instructor stands behind child and physically manipulates arm swing.

2. Instructor faces child with his arms outstretched and palms down; child swings arms from back position so as to strike instructor's hands with his own.

3. With his arms at his sides, child swings arms back and forth independently in a pendulum like manner.

4. With assistance and with arms in front of body at shoulder level, child swings arms backward while bending knees to semi-squat position and then swings arms forward to at least head level while straightening his knees (stretch body). This should eventually be done rhythmically and independently.

Behavioral Objective: #2

To develop horizontal jumping for distance, i.e., 12-18 inches, and landing on two feet simultaneously—The child, using a two foot take off and landing and swinging the arms to at least head level as jump is executed, independently jumps forward 12-18 inches two out of three times.

Teaching-Learning Experiences:

1. Review Level I teaching-learning experiences—height increases 12-16 inches. (Emphasis is on simultaneous two foot take off and landing.)

2. Child jumps from a set of footprints to another set of same or from squares on the floor to other squares. (Emphasis is on simultaneous two foot take off and landing.

3. Child jumps forward over painted lines on the floor, ropes, etc.
P.B.C. ACTIVITY: JUMPING

LEVEL: IV

Behavioral Objective: #1

To demonstrate a mature jump for distance (18-21")--The child jumps forward 18-21" using a two foot take off and landing; swinging arms backward and then forward to above head level during push off of jump; dropping arms to a position in front of body in landing, and maintaining balance without touching the hands to the floor at the end of jump two out of three times. (Encourage child to jump as far as possible.)

Teaching-Learning Experiences:

1. Jump in and out of various patterns and designs on the floor made by jumping ropes, hoops, wands, benches, or balance beams.

2. Child jumps forward from spring board to floor, emphasis on two foot take off and landing.

3. Place several sticks on the floor. Jump over the sticks consecutively.
   a. Use two sticks.
   b. Use three sticks, etc.

4. Jump over a rope positioned at various heights--begin initially a few inches off the floor and raise rope as child performs more skillfully.

5. Child jumps over sticks or wands placed on blocks or standards approximately 6-12 inches high (like hurdles).

Note: Encourage child to swing arms back until hands are at least waist level in initiating the jumping movement.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY MATURE JUMP

1. Jump sideways; jump backwards.
   a. Jump over a stick sideways then backwards.

2. Jump over a stick while holding one end and resting the other on the ground.

3. Jump over stick, tire, etc. and add turn in the air.
   a. \( \frac{1}{4} \) turn.
   b. \( \frac{1}{2} \) turn.
   c. Whole turn.

4. Instructor holds two sticks approximately shoulder width apart, child jumps between sticks and then out from between them.
   a. Start with sticks at a reasonable height and gradually increase it.
   b. Raise one stick higher than the other.
   c. Change the distance between the sticks.

5. Jump the shot. Instructor swings a rope around his body in a circle of about 8 feet. Child jumps over the end of the rope when it comes to him (a weight is needed on the end of the rope to keep it on the floor).

6. Child jumps from figure to figure, letter to letter, or number to number on request and/or first identifying the figure, letter, or number.


8. Jump a rolling tire.
   a. Front jump.
   b. Side jump.
   c. Straddle jump.
   d. Step jump.

9. Child does a running broad jump.

10. Child jumps over a stick which he holds in both hands.

These as well as numerous other items related to jumping may be found in:

Behavioral Objective: #1

To throw using 2 hands, feet may move--When standing approximately five feet from the instructor, the child throws a 6 inch playground ball with two hands (both arms used in unison) in any manner in the direction of the instructor two out of three times; his feet may move, and his body may shift.

Teaching-Learning Experiences:

1. While standing, and with arms at waist level, child drops yarn ball, bean bag or ball into instructor's hands.
   a. While sitting pick up ball etc. and drop into box.

2. While sitting with his legs spread and feet touching the wall, the child with assistance from instructor rolls the ball toward the wall.

3. While sitting, the child independently rolls the ball toward the wall.
   a. Rolls toward the instructor.

4. While standing, the child drops the ball from waist/chest level to a spot on the floor. Gradually move spot away from child to increase bouncing of ball -- this may be done facing a wall.

5. Child throws ball at the wall with two hands and assistance from instructor.

6. Child independently bounces ball toward instructor by using a two-hand throwing pattern.

7. Child throws ball to instructor with two hands.
P.B.C. ACTIVITY: THROWING

LEVEL: II

Behavioral Objective: #1

To throw using 1 hand, upper body twist, feet do not move—When standing approximately five feet from the instructor and with foot opposite throwing arm ahead of other foot (*staggered foot position), the child, using a single-hand sidearm/overhand throw and twisting the upper body first toward the side of the throwing arm and then forward to the opposite side, throws a tennis ball in the direction of the instructor two out of three times.

*Staggered foot position is achieved by taking a normal standing position with feet approximately shoulder width apart and taking one step forward — preferably with foot opposite throwing arm.

Teaching-Learning Experiences:

1. While standing with feet spread and parallel, the child with his hands on his hips, twists first to one side and then the other repeatedly.
   a. Repeat with arms out to the sides at shoulder level.
   b. Perform same activities in staggered foot position.

2. While standing in the staggered foot position approximately 1-2 feet away from the wall and with his back to the wall, the child twists and touches wall behind him on the side of the throwing arm, twists forward and swings at and attempts to slap balloons positioned at side of body approximately arms length away and between chest and waist level.
   a. Child twists and touches wall behind him on the side of the throwing arms, twists forward, and throws yarn balls, bean bags, tennis balls at balloons positioned just beyond arms distance away and between chest and waist level.
   b. Same as above except remove balloons and throw at large distant targets, e.g., a wall.
   c. Same as "b" except child is moved away from wall.

3. Given the teacher as a model, the child will imitate the teacher's arm motion as she throws a tennis ball overhand.

4. While standing in the staggered foot position, the child is encouraged to hit a large target with no assistance from approximately 5-10 feet using yarn balls, bean bags, and tennis balls.
Behavioral Objective: #1

To throw while stepping with alternate foot—When standing approximately ten feet from the instructor, the child, using a single-hand, sidearm/overhand throw, twisting the body first toward the side of the throwing arm and then forward to the opposite side, and stepping with leg on side opposite throwing arm, throws a tennis ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. While standing with his feet on the appropriate footprints (foot opposite throwing arm is forward, pointing at target while the other foot is immediately behind the lead foot and positioned at a 45° angle), the child throws a tennis ball in the direction of the instructor or a target.

2. Same as above except child takes a short step forward with lead foot (maybe onto another footprint) and throws tennis ball in direction of instructor or target.

3. Child throws as above without the use of visual cues.

4. Child throws at target of various sizes from 5-10 feet away.
Behavioral Objective: #1

To throw while stepping with alternate foot and demonstrating definite upper body twisting and shifting of body weight—When standing approximately fifteen feet from the instructor, the child, using a single-hand, sidearm/overhand throw; twisting upper body backwards and shifting weight to foot on side of throwing arm during backswing; stepping with leg opposite throwing arm and twisting upper body forward after shifting weight onto foot opposite throwing arm, arm snapping wrist in process of releasing ball, throws a tennis ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. Child stands with side of body facing target; he steps in direction of target onto a footprint, etc. and throws tennis ball.

2. Child stands with shoulder facing target; he steps and throws tennis ball (no visual cues).

3. Child stands with front of body at a 45° angle to the target; he steps and shifts to a position with side of body facing target, steps in direction of target onto a footprint, etc. and throws tennis ball.

4. Same as above except no visual cues.

5. Child stands facing target; he steps and turns to a position with side of body facing target, steps in direction of target onto a footprint, etc. and throws tennis ball.

6. Same as above except no visual cues.

7. Child throws at targets of various sizes from 10 to 15 feet away.

8. For refinement of wrist snap movement, the following activities are suggested:

   a. While lying on abdomen with his elbow on the floor, the child throws yarn balls, bean bags, and tennis balls at a target on the floor at various distances.
   b. While lying on abdomen with his elbow on the floor, the child throws yarn balls, bean bags, and tennis balls into a box, etc. which is only a short distance in front of him.
   c. Maybe repeated while sitting at a table in an upright position.
1. Throw and catch off wall.

2. Throw to a pitch back device.

3. Throw and break balloons taped to wall.

4. Throw different sizes, weights, and shapes of balls, e.g., a nerf football.

5. Stretch rope(s) 5-6 feet off ground, child throws ball over rope and runs to other side to catch it.
   
   a. Increase height of rope.
   b. Gradually increase distance from side to side.

6. Throw for distance -- mark previous best to be used as target.

7. Throws with accuracy.
   
   a. Place various size targets on wall (small to large).
   b. After each success at a specified target, move further back and attempt to hit same target.

8. Throws with accuracy for distance.
   
   a. Place target on floor -- after each success move further back and attempt to hit same target.
   b. Suspend target -- same as above.

9. Plays catch with another person.

10. Work with a partner or in groups passing a ball or balls from one to another in rhythm.
    
    a. Vary with bounce passes.
Behavioral Objective: #1

To follow and attempt to scoop (basket) catch a balloon approximately 6" in diameter—When standing approximately 5 feet from the instructor, the child can follow a balloon approximately 6" in diameter into his arms and attempt to perform a scoop (basket) catch without turning his head or leaning backwards (fear reaction) two out of three times.

Teaching-Learning Experiences:

*1. Child watches a suspended ball which is swinging from near to far in front of him and attempts to touch or catch it.

*2. Child watches suspended ball which is swinging from right to left at shoulder level and attempts to touch or catch it.

*3. Child watches suspended ball which is swinging in a circle in front of him and attempts to touch or catch it.

*4. Child watches a suspended ball which is swinging in large circles around his body at shoulder level and attempts to touch or catch it.

* The ball used in the tracking activities should be 8-10 inches in diameter and consisting of rubber, plastic or yarn material.

5. While sitting the child tracks and stops a rolling balloon (6-8 inches) with his hands.
   
   a. Rolling slightly right.
   b. Rolling slightly left.
   c. Rolling straight at him.

6. While sitting the child tracks a balloon and lets it roll up his arms (if possible child should squeeze balloon into his chest).

7. Same as number 5 above, except child is kneeling.

8. Same as number 6 above, except child is kneeling.

9. Child catches or attempts to catch a balloon or yarn ball thrown directly into his arms.
Teaching-Learning Experiences: Level I, B.O. #1

10. Child tracks and catches yarn balls, bean bags, etc. in large tin cans or buckets.

11. Child keeps balloons in the air by batting them with his hands.

12. Child bats balloons with hand continuously against wall.

The first four teaching-learning experiences can be found in:

Behavioral Objective: #1

To catch using the hands and arms to scoop the ball into the body—When standing approximately 5 feet from the instructor, the child, using the hands and arms (bent at the elbows) to scoop or bring the ball into his body, catches the 6-8 inch ball thrown underhand two out of three times.

Teaching-Learning Experiences:

1. Child sits with legs spread and with assistance stops a balloon rolled to him by instructor.
   a. Child stops a rolling ball.
      
      Note: Instructor sits opposite child and holds one hand; he rolls the balloon/ball and grasps the child's other hand. Child stops balloon/ball with both hands.

2. Child sits with legs spread and independently stops a ball rolled to him by instructor.

3. Child sits with legs spread and feet touching the wall; he stops a ball with assistance which rebounds off the wall.
   
   Note: Instructor sits behind child, rolls ball and then grasps his hands.

4. Same as above, child performs independently.

5. Child sits with legs spread; with his hands in a palms up position he receives a ball which rebounds off the wall and scoops it off the floor into his chest (with assistance).

6. Same as above, child performs independently.

7. Child sits with legs spread; with his hands in a palms up position he receives a bounced ball and scoops it into his chest.

8. Child sits with legs spread; with his hands in a palms up position he receives a tossed ball and scoops it into his chest.

9. Same as number 7, except child is kneeling.

10. Same as number 8, except child is kneeling.
Teaching-Learning Experiences: Level II, B.O. #1

11. Child stands approximately 5 feet from instructor; with his hands in a palms up position he receives a bounced ball and scoops it into his chest.

The activities listed above should utilize a playground ball approximately 6-8 inches in diameter.
Behavioral Objective: #1

To catch using only the hands with palms up—When standing approximately 5 feet from the instructor, the child, using only his hands with palms up, catches a 6-8 inch ball thrown underhand two out of three times.

Teaching-Learning Experiences

1. Child sits with legs spread and catches a yarn ball rolled to him by the instructor.
   a. Catches a ball.

2. Child kneels and catches a yarn ball rolled to him by the instructor.
   a. Catches a ball.

3. Child sits with legs spread and catches a yarn ball tossed into his hands.
   a. Catches a ball.

4. Child kneels and catches a yarn ball tossed into his hands.
   a. Catches a ball.

5. Child stands and receives a controlled toss with a 6-8 inch ball from the instructor.
   a. Increase height and length of toss as child becomes better able to handle controlled toss.
   b. For a change, bounce the ball.

Note: A controlled toss is a throw which is guided into the hands of the child by the instructor and which does not require a lot of adjustments on the part of the catcher.
Behavioral Objective: #1

To catch with bent arms at sides and hands cupped—When standing approximately 10 feet from the instructor, the child, holding the arms bent at the elbows at the sides of body and using the hands in a cupped fashion such that on throws above the waist the thumbs are nearly touching and on throws below the waist the little fingers are close together, catches a 6-8 inch ball thrown underhand four out of six times. (Note: Half of the throws should be below waist level and half above chest level.)

Teaching-Learning Experiences:

1. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a yarn ball or bean bag.

2. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a yarn ball or bean bag.

3. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a 6-8 inch ball.

4. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a 6-8 inch ball.
   a. Start at 5 feet and gradually move out to 10 feet.

5. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at waist level or below with a tennis ball.
   a. Start at 5 feet and gradually move out to 10 feet.
   b. Catch ball thrown slightly to the right.
   c. Catch ball thrown slightly to the left.

6. Child stands and receives a controlled toss from the instructor who is approximately 5 feet away; the toss is directed at chest level or higher with a tennis ball.
   a. Start at 5 feet and gradually move out to 10 feet.
   b. Catch ball thrown slightly to the right.
   c. Catch ball thrown slightly to the left.
Teaching-Learning Experiences: Level IV, B.O. #1

* a. Increase height and length of toss as child becomes better able to handle controlled toss.
   b. For a change, bounce the ball.

Note: A controlled toss is a throw which is guided into the hands of the child by the instructor and which does not require a lot of adjustment on the part of the catcher.
1. Throw and catch off wall.

2. Throw to a pitch-back device and catch rebounds.

3. Play catch.

4. Catch with scoops (bleach bottles), tin cans (of various sizes), baseball glove.

5. Stretch rope(s) 5-6 feet off ground, child throws ball over rope and runs to other side to catch it.
   a. Increase height of rope.
   b. Gradually increase distance from side to side.

6. Throw a ball up high, clap your hands and catch it with two hands.
   a. Catch with one hand.

7. Throw a ball up high, let it bounce, catch it with two hands.
   a. Catch with one hand.

8. Throw a ball up high, let it bounce, turn around, catch it with two hands.
   a. Catch with one hand.

9. Catches while running.
   a. Runs right.
   b. Runs left.
   c. Runs forward.
   d. Runs backward.
Behavioral Objective: #1

To walk up to a ball and make contact with it—When in a standing position with a ball approximately 6-8 inches in diameter placed in front of but not more than two feet away from him, the child walks up to and pushes the ball two out of three times.

Teaching-Learning Experiences:

1. While sitting on a chair or stool child kicks or pushes a ball with his feet.

2. While walking, child pushes a large beach ball or cage ball with his body, primarily the lower extremities.

   Note: Hands should not be used.

   a. Child walks up to large beach ball or cage ball, makes contact and continues to push it.

3. While walking, child pushes bean bags/yarn balls with his feet.

4. Child walks up to and either touches or pushes a balloon approximately 6-8 inches in diameter.

5. Child walks up to and either touches or pushes a 6-8 inch ball.
Behavioral Objective: #1

To kick a ball from a stationary standing position with bent knee action—When in a stationary standing position with a ball approximately 6-8 inches in diameter placed in front of his foot, the child, using a bent knee action, kicks the ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. While sitting on a chair large enough to prevent his feet from touching the floor, the child kicks a balloon.
   a. Kicks a ball.

2. Child lays on his back with knees bent and feet flat on the floor; he swings the entire leg in an attempt to kick a balloon held by the instructor or other support structure.

3. While leaning with both hands against an object at approximately shoulder level, e.g., parallel bars or rings, etc., the child kicks a balloon.
   a. Kicks a 6-8 inch ball (emphasis on bent knee).

4. With the instructor supporting one side/arm, child kicks a balloon.
   a. Kicks a 6-8 inch ball (emphasis on bent knee).

5. Child maintains a stationary one-foot balance position on the non-kicking leg for 1-3 seconds.
   a. Child attempts to step on balloons with his feet.

6. Child maintains a stationary one-foot balance position on the non-kicking leg for 1-3 seconds and then simulates a kicking motion.

7. Child independently kicks a stationary balloon with emphasis on bent knee action.

8. Child independently kicks a 6-8 inch stationary ball with emphasis on bent knee action.
Behavioral Objective: #1

To walk up to and kick a ball by swinging the bent kicking leg forward with simultaneous straightening of the leg—When in a standing position with a ball approximately 6" in diameter placed in front of but not more than five feet away from him, the child runs up to the ball, places his weight on the non-kicking leg, swings the bent kicking leg forward while simultaneously straightening the bent leg and kicks the ball in the direction of the instructor two out of three times.

Teaching-Learning Experiences:

1. While walking slowly, the child performs a series of one foot balance tasks up to 3 seconds duration, i.e., step-balance on left, step-balance on right, etc.

2. While walking slowly, the child performs a series of one foot balance tasks and then simulates a kicking motion, i.e., walk-balance-kick, walk-balance-kick, etc.

3. While in a stationary standing position, the child maintains his balance on the non-kicking leg for 2-3 seconds and then kicks a 6-8 inch ball placed on the floor in front of him.

4. Child walks up to a ball, places his weight on the non-kicking leg, maintains this position for 2-3 seconds and then kicks the 6-8 inch ball.
Behavioral Objective: #1

To run up to and kick a ball by swinging the bent kicking leg forward with simultaneous straightening of the leg, by leaning the body backward, and by stepping forward onto the kicking leg after follow-through—When in a standing position with a ball approximately 6" in diameter placed in front of but not more than 10 feet away from him, the child runs up to the ball, places his weight on the non-kicking leg, swings bent kicking leg forward while simultaneously straightening the bent leg, leans body backward, and kicks the ball in the direction of the instructor two out of three times; after each kick, he steps forward onto the kicking leg--only after the follow-through is completed.

Teaching-Learning Experiences:

1. When in a stationary standing position, the child kicks a 6-8 inch ball placed on the floor in front of him.

2. While running the child places the non-kicking foot on a footprint and simulates a kicking motion.
   a. Add ball.

3. While running the child places his weight on the non-kicking leg and simulates a kicking motion; after the follow through, he steps forward with kicking leg to a footprint or other object.

4. Child takes one step and kicks a 6-8 inch ball placed on the floor in front of him and follows through onto a footprint.
   a. Repeat until child is taking 3-5 steps.

5. Child runs and kicks a 6-8 inch ball and then steps onto a footprint or other object with the kicking foot.

6. Same as above without visual cue.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY MATURE KICK

1. While running, child kicks a ball rolled to him.
2. Child kicks for distance.
3. Child kicks with accuracy at targets placed on the wall or on the floor.
5. Kick ball back and forth with a partner.
6. Keep a ball going by kicking it repeatedly against a wall.
7. Kick a ball dropped from his hand(s).
Behavioral Objective: #1

To swing a bat with one hand in a sidesarm motion, the feet may move—When in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 36 inches long in one hand, and with the shoulder of the free hand facing the instructor, the child, using a forward sidesarm swing, strikes a balloon tied to a string and suspended to waist level two out of three times; his feet may move.

Teaching-Learning Experiences:

1. Child beats a drum with his hand.
   a. Uses a stick.

2. Child swings at an inflatable BO-Bo clown or a floor punching bag with his hand.
   a. Uses a stick or wand.

3. With his hand child swings at balloons tied to string and supported from the ceiling or other support structure.
   a. Sitting on floor.
   b. Kneeling on floor.
   c. Standing.

4. With his hand, child swings at balloons tied to string and supported from the ceiling or other support structure.
   a. Swings at balloon with paddle.
   b. Swings at balloon with a plastic bat or 1" wooden dowel.
Behavioral Objective: #1

To swing a bat with two hands in a sidearm motion, the feet may move—When in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 36 inches long in two hands, i.e., hand of leading shoulder on bottom, and with the side opposite the bat facing the instructor, the child, using a forward sidearm swing, strikes a balloon tied to a string and suspended to waist level two out of three times; his feet may move.

Teaching-Learning Experiences:

1. With two hands on a bat, the child swings at a balloon or large playground ball off a batting tee.

2. With two hands on a bat, the child swings at a balloon tied to string and supported from the ceiling or other support structure.

3. With two hands on a bat, the child swings at a balloon tied to string and supported from the ceiling or other support structure and moving in an arc toward him. (Suggest placing a penny in the balloon to facilitate better arc.)

4. With two hands on a bat, the child swings at a tossed balloon.
Behavioral Objective: #1

To swing a bat with two hands in a sidearm motion, with trunk rotation, the feet may move—When in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 36 inches long in two hands, i.e., hand of leading shoulder on bottom, and with the side opposite the bat facing the instructor, the child, shifting his body weight in the direction of swing and swinging in a forward sidearm motion, strikes a ball 6 inches in diameter tied to a string and suspended to waist level two out of three times; his feet may move.

Teaching-Learning Experiences:

1. While standing with feet spread and with his arms wrapped around a bat positioned behind him and parallel to the floor, the child twists first to one side and then to the other repeatedly.

2. With his back against the wall, the child clasps his hands with arms extended and swings from side to side repeatedly while touching the wall on both sides.

3. Instructor places his hand approximately 4 to 6 inches from the middle of the child's back at shoulder level; the child with feet parallel and shoulder width apart, turns from side to side repeatedly stopping each time he feels the instructor's hand against his shoulder.

4. Child clasps his hands with arms extended and swings from side to side repeatedly while striking balloons on both sides which are tied to strings and supported from the ceiling or other support structure.

5. With two hands on a bat, the child swings at a 6" ball off a batting tee with emphasis on twisting body.

6. With two hands on a bat, the child swings at a balloon tied to string and supported from the ceiling or other support structure with emphasis on twisting body.
   a. Swings at 6" ball tied to string and moving in an arc toward him.

7. With two hands on a bat, the child swings at a tossed balloon with emphasis on twisting body.
Behavioral Objective: #1

To swing a bat with two hands in a sidearm motion, with trunk rotation, and with a step in the direction of the swing—When in a standing position, holding a plastic bat (or 1" wooden dowel) 20 to 36 inches long in two hands, i.e., hand of lead shoulder on bottom, and with the side opposite the bat facing the instructor, the child, stepping and shifting body weight in direction of swing, twisting hips and upper body during and after the shifting motion, and swinging with a sidearm motion, strikes a ball 6 inches in diameter tied to string and suspended to waist level two out of three times.

Teaching-Learning Experiences:

1. While standing with his feet on the appropriate footprints and with two hands on a bat, the child swings bat (simulated activity) with emphasis on twisting body.
   a. Swings at balloon resting on batting tee.
   b. Swings at ball 6" in diameter resting on batting tee.
   c. Swings at plastic softball or tennis ball resting on batting tee.

2. Same as above except child takes a short step, i.e., 3-5 inches, forward with lead (front) foot (may be onto another footprint) and swings bat (simulated activity).
   a. Swings at balloon resting on batting tee.
   b. Swings at ball 6" in diameter resting on batting tee.
   c. Swings at tennis ball resting on batting tee.

3. Child swings as above without the use of visual cues.

4. In the appropriate striking stance, the child takes a full step, i.e., 6-9 inches, forward with lead (front) foot (may be onto another footprint) and swings bat (simulated activity).
   a. Swings at balloon resting on batting tee.
   b. Swings at ball 6" in diameter resting on batting tee.
   c. Swings at tennis ball resting on batting tee.

5. Child swings as above without the use of visual cues.

6. Repeat progression (#1-#5) with objects tied to string and suspended to waist level.
SUPPLEMENTARY ACTIVITIES UTILIZING A FUNCTIONALLY MATURE STRIKE

1. Drop ball and hit it after it bounces.
2. Serve as in volleyball (to the wall or to a partner).
3. Hits ball out of hand.
4. Plays paddle ball games.
5. Bats off tee for accuracy.
6. Bats off tee for distance.
7. Hits ball against wall repeatedly using hand, paddle or racket.
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ARTICLES


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