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ABSTRACT

As one of the components of the Project ACTIVE (All Children Totally Involved Exercising) Teacher Training Model Kit, the manual is designed to enable the educator to organize, conduct, and evaluate individualized-personalized physical education programs for children (prekindergarten through high school) with motor disabilities or limitations. An introductory chapter includes definitions and criterion-referenced objectives which provide a basis for evaluating student and teacher performance. In Chapter II, procedures for testing, assessing, prescripting, and evaluating the physical fitness and motor performance of children are outlined and an instrument for gathering information related to the self-esteem of students in the program is provided. Recommended in Chapter III are learning experiences to involve both the students and teacher in the training program. Described in Chapter IV are tasks and activities intended to provide exercises directed to all parts of the body. Appended materials include a motor disabilities/limitations flow chart and activity checklist, a glossary, and a behavioral performance chart. (SBH)

Township of Ocean School District
Dow Avenue
Oakhurst, New Jersey 07755

MOTOR DISABLITIES OR LIMITATIONS

AN INDIVIDUALIZED PROGRAM

Thomas M. Vodola, Ed.D.
Project Director

Project ACTIVE: All Children Totally InVolved Exercising

Project Number: 72-341, Title III-IV (C), ESEA

MEMO FROM THE COMMISSIONER

"On behalf of the Department of Education, State of New Jersey, I wish to bring Project ACTIVE to the attention of educators throughout the nation. The program has made a significant contribution to both physical and special education in New Jersey and thus will be of interest to both educators and parents."

Dr. Fred G. Burke
Commissioner of Education
New Jersey Department of Education

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TOWNSHIP OF OCEAN SCHOOL DISTRICT
1976

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	Egg Harbor
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	Paramus
	Rutherford
	Englewood Community
Burlington	Lenape Regional High School
	Maple Shade
	New Lisbon State
	Willingboro
Camden	Bellmawr
	Stratford
Cape May	Lower Township
	Ocean City
	Association for Children with Learning Disabilities
Cumberland	Bridgeton
	Vineland State
Essex	Glen Ridge
	Livingston
	Montclair
Hudson	Hoboken
	Jersey City
	Weehawkin
	St Joseph School for the Blind
	Bayonne Parks & Recreation
Hunterdon	Hunterdon Central Regional
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	North Hunterdon Regional
Mercer	Trenton
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Morris	Madison
	Morris Hills
	Pequannock Township
Ocean	Lakehurst
	Long Beach Island
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Warren	Oxford Township

PREFACE

The development of the Project ACTIVE manual, *Adapted Physical Education: Motor Disabilities or Limitations* was a cooperative effort of the Township of Ocean School District and the Office of Program Development, Division of Research, Planning and Evaluation/Field Services, Department of Education, State of New Jersey.[1] The manual provides a sound basis for individualizing a physical education program for students who evidence physical fitness problems.

In 1975 the Project ACTIVE manual, *Adapted Physical Education: Motor Disabilities or Limitations* was validated by the standards and guidelines of the United States Office of Education as successful, cost-effective and exportable. As a result, the program is now funded through the New Jersey Elementary and Secondary Act, Title III program to offer interested educators the training and materials required for its replication. This manual was prepared as part of the program's dissemination effort.

The purpose of Title III is to encourage the development and dissemination of innovative programs which offer imaginative solutions to educational problems. Project ACTIVE achieved this purpose by disseminating its innovative program to 500 teachers and paraprofessionals through 24 regional workshops. Further, as of June 1975, 76 school districts and agencies in the State of New Jersey have adopted or adapted some aspect of the individualized physical education program in accordance with the educational needs of their districts – involving more than 10,000 individuals.

This manual has been prepared as one of the components of the Project ACTIVE Teacher Training Model Kit. Other component parts of the model kit which are available to those who are interested in adopting or adapting the projects individualized-personalized instructional concept are cited below:

1. Developmental Physical Education:[1] Low Motor Ability
2. Developmental Physical Education: Low Physical Vitality
3. Adapted Physical Education:[2] Postural Abnormalities
4. Adapted Physical Education: Nutritional Deficiencies
5. Adapted Physical Education: Communication Disorders
6. Adapted Physical Education: Breathing Problems
7. Developmental & Adapted Physical Education: A Competency-Based Teacher Training Manual

These manuals have been validated for national dissemination and may be purchased from the project director.

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[1]Developmental Physical Education is defined as that aspect of the physical education program which addresses itself to the provision of enrichment of physical activities for those students who are below normal in terms of physical fitness, motor performances, and/or perceptual motor performance.

[2]Adapted Physical Education is defined as that aspect of the physical education program which addresses itself to the provision of enrichment of physical activities for those students who evidence medically-oriented problems.

Districts interested in establishing individualized physical education programs for the handicapped need assistance. The following dissemination-diffusion services are being provided to aid implementing schools during the initial phases of program installation:

- In-Service Teacher Training Programs
- Individual Pupil Time Prescriptions
- Certificates of Merit for Pupil Achievement and/or Improvement
- Monthly Issue of the ACTIVE Newsletter
- Test Instruments to Assess Pupil Performance
- Development of School Norms
- Other General Consultant Services

For additional information regarding the Model Kit, other awareness materials, or available services, the reader is requested to contact:

Dr. Thomas M. Vodola, Director
Project ACTIVE
Township of Ocean School District
Dow Avenue
Oakhurst, New Jersey 07755

ACKNOWLEDGEMENTS

The manual, *Adapted Physical Education: Motor Disabilities or Limitations* is based on the Developmental and Adapted (D&A) Program developed by the Project Director in the Township of Ocean School District, Oakhurst, New Jersey.

Appreciation is expressed to the Township of Ocean Board of Education, Superintendent of Schools, the D&A Council, teachers, students, and parents for their total commitment to the program. Special appreciation is accorded to Township of Ocean Physical Education Department for their unstinting support and effort.

To Prentice-Hall, Inc., a special vote of thanks for granting the Project Director permission to include materials from his text, *Individualized Physical Education Program for the Handicapped Child.*

Sincere appreciation is also accorded to the Advisory Council members who assisted in the reviewing and editing process: Mr. Sal Abitanta, Consultant, New Jersey State Department of Education, Dr. David Bilowit, Professor, Kean College of New Jersey, Mrs. Edwina M. Crystal, School Psychologist, Township of Ocean School District, Mr. Al Daniel, Coordinator, Developmental Physical Education, Cherry Hill School District, Dr. George Gerstle, Assistant Professor, Glassboro State College, Mr. Paul Porado, Program Director, Office of Special Services, New Jersey Department of Education, and Dr. Marion Rogers,* Professor, Glassboro State College. Also special thanks to the project consultants; Miles Drake, M.D., representative of the New Jersey Chapter of the American Academy of Pediatrics; Dr. Raymond Weiss, Professor, Department of Health, Physical Education and Recreation, New York University, and Dr. Julian U. Stein, Director, Program for the Handicapped, American Association of Health, Physical Education and Recreation, Washington, D.C.

To Mrs. Jean Harmer, Mrs. Mary Kesperis, Mrs. Dorothy Smith, Mrs. Margaret Campbell and Mrs. Ellen Kearney, we express gratitude and appreciation for their painstaking devotion to the development of the intermediate "product."

Grateful appreciation is expressed to the New Jersey State Department of Education and the Title III staff members for their continued assistance and support. To Dr. Lillian White-Stevens, a deep debt of gratitude for her editing expertise.

Special thanks are extended to the Project ACTIVE cadre team, for the many hours they devoted to assisting in the restructuring of the "final" product. The synthesizing team consisted of: Mrs. F. June Graf, Livingston School District; Mr. Robert Fraser, Wayne Township Public Schools; Mr. Robert Ekblom, Madison Township Public Schools; Mr. Thomas Cicalese, Morris Hills Regional District; Mr. Tim Sullivan, Montclair State College; Mr. G. "Buzz" Buzzelli, Monmouth College; Mr. Roy Lipoti, New Lisbon State School, Garden State School District; Mr. Edward Korzun, Orange Public School System; Mr. Thomas Pagano, Township of Ocean School District; Mr. Lawrence A. Guarino, Newark School District; and Dr. David Bilowit, Kean College of New Jersey. Credit for the art work is accorded to Mr. Arthan Anest, Wall Township School District.

*Retired as of July, 1973

To the many authors and publishers who permitted the use of their materials in the manual, I express my sincere appreciation.

Finally, to Emil Praksta** a representative of the South Jersey Educational Improvement Center, the co-director of this project and a personal friend, my sincere appreciation for his constant stimulation, support, and critiquing of all materials.

A final note: Although the aforementioned "team" made many constructive suggestions which were included in the manual, I accept full responsibility for the final product, and any criticisms thereof, because all final decisions were a reflection of my personal philosophy.

Thomas M. Vodola, Ed.D.
Title III, Project Director

**Recently deceased

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INTRODUCTION

CHAPTER ONE

INTRODUCTION

OVERVIEW

In the past, children with motor disabilities or limitations were admitted into our educational systems on a limited basis, determined by two factors: first, whether the facilities were adaptable to the unique needs of each child; and second, whether a competent staff was available to provide a sound instructional program. Recent court decisions however, have altered the situation drastically, in their declaration that all children are educable, regardless of their handicapping condition, and in their mandate that school districts must offer instructional programs geared to meet their specific needs. As a result, educators must be offered preservice, inservice, and graduate training programs so that they can attend to the unique physical, social, emotional, and academic needs of these children.

Adapted Physical Education: Motor Disabilities or Limitations has been developed to serve two purposes:

1. Provide a manual for training physical educators, special educators, recreation teachers, and paraprofessionals so they can achieve the minimal competencies necessary to implement an individualized motor program for students from pre-kindergarten through grade 12.[1]
2. Provide practitioners in the field with a structured procedure for individualizing and personalizing an instructional motor activity and physical fitness program for students exhibiting varying physical disabilities.[2]

This chapter includes definitions and criterion-referenced objectives which provide a basis for evaluating student and teacher performance. The remaining chapters are designed to enable the educator to evaluate, assist, guide, and encourage children. They detail Physical Fitness and Motor Ability tests, muscle girth measurements, strength decrement index, and range of motion assessment, whereby educators can identify the strengths and weakness of the children; they also provide assistance and guidance through exercises, crutch gaits, and games and activities. (A detailed description of the step-by-step procedures necessary for program implementation is presented in the flow chart and activity checklist in Appendix A.)

Thus, the educator must not only become acquainted with the evaluation devices and specific exercise programs, but he must also be thoroughly knowledgeable regarding the progression of exercises and activities.

It is recommended that all information and records on the child be assembled, reviewed and understood before a program of treatment is undertaken. The educator must be aware of many problems that may exist, and how he may assist the child with these problems. He must be able to provide the school, parents, and physician with necessary information concerning the progress or regression of the child.

Above all, he must be willing to stimulate within children the motivation and desire necessary for them to achieve success.

[1] Refer to Appendix G for a sample copy of the achievement certificate awarded to trainees in New Jersey who attain 20 of 25 competencies.

[2] Students who improve a minimum 20% on appropriate physical fitness and motor items are eligible to receive a Certificate of Merit. Refer to Appendix H for a sample copy of the certificate.

DEFINITIONS

Motor Disability or Limitation

A motor disability or limitation is defined as a dysfunction which impedes or limits the individual's ability to function motorically.

Individualized Instruction

Diagnosis and prescription are the basic ingredients necessary for the provision of individualized instruction (11). The strategies involved include: formal and informal testing, formative and summative assessment; prescription; and evaluation.

Personalized Instruction

Personalized instruction deals with the humanistic aspects of the teaching-learning process. Primary consideration is devoted to the development of teacher-pupil and pupil-pupil rapport and to the enhancement of the child's self-concept

STUDENT BEHAVIORAL OBJECTIVES

The student:

1. Demonstrates an improvement in physical fitness and motor ability (K-12). Evaluative criteria 10% improvement in those tests he can perform.
2. With muscles atrophied or undeveloped by disuse displays a 5% increase in muscle girth measurements (grades K-12.)[1] Evaluative criteria: pre- and post-test muscle girth measurements (K-12); results to indicate a measurable increase beyond the initial girth The 5% increase beyond the initial girth measurement can only be obtained if the student does not have a permanent medical condition that would not allow for any increase in girth measurement.
3. With muscles atrophied or undeveloped by disuse displays an increase in muscular strength (grades K-12). Evaluative criteria: pre- and post-test muscular strength measurements, results to indicate a minimum of a 5% increase beyond the initial strength measurement. (Student performance is assessed by the teacher in grades K-6 and by the partner in grades 7-12.)
4. With a limitation in range of motion, shows an increase in range of motion (grades K-12). Evaluative criteria a minimum of a 5% increase in the range of motion as measured by a goniometer, or a flexometer. Student performance is assessed by the teacher in grades K-8 and by the partner in grades 9-12).
   The 5% increase in range of motion as measured by a goniometer or a flexometer can only be obtained if there are no limiting factors of motion or if the child does not have a permanent medical condition that would not allow for any increase in range of motion.

[1] Refer to Appendix B for a glossary of terms.

Fig. 1-1 Goniometric Measurement of Range of Motion
(Teacher Training Program, Slayton, Minnesota)

5. Demonstrates the ability to determine his muscle girth measurement, Strength Decrement Index, and range of motion, grades 9-12 (where applicable). Evaluative criteria teacher observation.
6. Demonstrates the ability to interpret properly the results of his muscle girth measurements, Strength Decrement Index, and range of motion, grades 9-12 (where applicable). Evaluative criteria teacher observation.
7. Demonstrates the ability to select specific therapeutic exercises to increase muscle girth, strength, and range of motion, grades 9-12 (where applicable) Evaluative criteria: teacher observation.
8. Manifests a positive self-concept, or attitude toward physical activity (grades K-12). Evaluative criteria: pre- and post-self-concept test, grades K-4, pre- and post-Wear Attitude Inventory, grades 5-12 (10% gain in raw score.)

Fig. 1-2 Self-Concept Testing
(Training Program, University of Northern Iowa, Cedar Falls)

9. Who utilizes crutches, demonstrates proficiency in locomotor skills (grades K-12). Evaluative criteria for ambulation:
   Outdoors
   Ability to ambulate a minimum of 48 feet in 20 seconds[1]
   Ability to ascend and descend ramps and curbs
   Indoors
   Ability to get from the floor to crutches
   Ability to ambulate a minimum of 20 feet over smooth and/or carpeted floors[2]
   Ability to ascend and descend ramps and stairs

Fig. 1-3 Motor Testing
Jordan Valley School District, Sandy, Utah

10. Who utilizes crutches, demonstrates proficiency in activities of daily living (K-12): Transfer from crutches to toilet and from toilet to crutches (K-12), from car to crutches and from crutches to car (3-12). Evaluative criteria: teacher observation.
11. Demonstrates the ability to modify games and activities to meet his temporary and permanent limitations, grades 9-12 (where applicable). (Modification is assessed by the teacher in grades K-8). Evaluative criteria: teacher observation.
12. Evidences joy in participating in physical activity modified according to his needs (grades K-12). Evaluative criteria: repeated student participation in the activities during class time or after school, and evidence of personal satisfaction. (Student performance is assessed by the teacher.)

    Note: Student participation in the program is predicated on the basis of physician or parental approval of all activities.

TEACHER BEHAVIORAL OBJECTIVES

The teacher:

1. Measures range of motion of a subject's knee joint via use of the Leighton flexometer and goniometer. Evaluative criteria: materials distributed in class.
2. Determines the Strength Decrement Index of an atrophied muscles group. Evaluative criteria: use of Clarke's Strength Decrement Index Formula.
3. Demonstrates the correct technique for fitting axillary crutches. Evaluative criteria: materials provided in class.
4. Demonstrates and teaches the correct procedures for crutch-walking using the four-point, three-point, two-point, and swing-through gaits. Evaluative criteria: materials distributed in class.
5. Demonstrates and teaches the correct procedure for determining cane length and walking with a cane. Evaluative criteria: materials to be provided in class.
6. Demonstrates and teaches two tasks and activities modified according to the needs of a child confined to a wheelchair, or utilizing crutches. Evaluative criteria: referential source documentation, or logical rationale.

[1] Need. to cross a street safely
[2] Need to cross a large room.

TEST ASSESSMENT PRESCRIPTION EVALUATION PROCEDURES

CHAPTER TWO

TEST PROCEDURES

TAPE

Physical problems must be identified before they can be remedied. The best means of determining these defects is through the use of formal and informal measuring-instruments. This chapter outlines procedures for Testing, Assessing, Prescripting and Evaluating (TAPE) the physical fitness and motor performance of children who manifest motor disabilities or limitations (MDL).[1] In addition, the reader is provided with an instrument for gathering information related to the self-esteem of students in the Developmental and Adapted (D&A) Program.

TEST ADMINISTRATION

The proposed instruments provide a viable means of determining the physical fitness, motor ability, strength, flexibility, crutch and wheelchair competency and self-concept of the MDL child. Directions for administering each instrument are herewith provided. Appendices C & D, respectively, provide tables for converting the physical fitness and motor ability raw scores to percentiles, stainines and index scores.

Fig. 2-1 Adapting the Test to the Student
Courtesy of Morris Hills High School

[1]The term "TAPE" was conceived by Frank Hayden, Physical Fitness for the Mentally Retarded, p. 9.

Township of Ocean Physical Fitness Test.

Physical Fitness Test

Test Item No. 1: *Static arm hang*
Factor: Arm and Shoulder Strength

After demonstration, the subject is assisted to the starting position (with arms flexed and chin above bar). The subject is not allowed to touch any part of his head to the bar, to kick, struggle, or move his body. Palms are to face away from the body. Special efforts are to be made to keep the subject in the starting position, especially as they begin to tire. The score recorded is the *number* of seconds from the signal "go" (starting position) until the arms are "locked" completely straight (finished position).
Attempts: 1
Scoring: Total suspension time in seconds

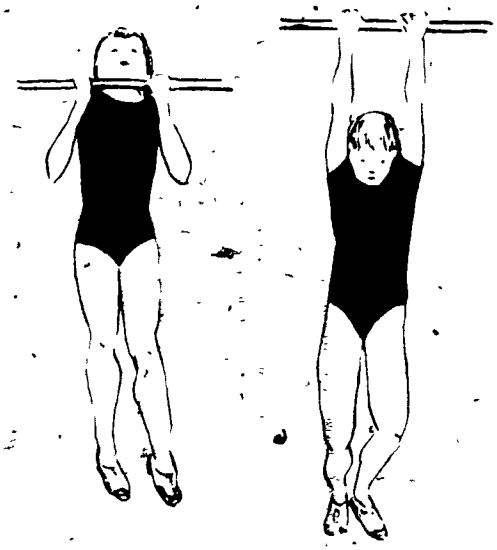


Fig. 2-1 Static Arm Hang

Test Item No. 2: *Modified sit-ups (curl-ups)*
Factor: Abdominal Strength

After demonstration, the subject assumes a supine position on a mat, with arms straight and palms resting on the thighs. On the command "go," the subject raises his head and shoulders and slides his hands forward until he touches the upper edges of his kneecaps; he, then, immediately returns to the supine position. To increase reliability and objectivity, the instructor places his hand across the child's kneecaps and counts as the child touches his arm

The subject is not permitted to "bounce" up, raise hands off legs, or rest between curl-ups (stress a steady rhythm). The score recorded is the number of times the student touches the extended arm properly. Repeat the count when performing incorrectly.
Attempts: 1
Scoring: Total correct curl-ups

Fig. 2-2 Modified Sit-Ups

Test Item No. 3: *Standing broad jump*
Factor. Explosive Leg Power

After demonstration, the subject stands with his toes behind the take-off line, his feet several inches apart. He is to jump as far forward as possible. Before jumping, he bends his knees and swings his arms forward. No restrictions are placed on his arm movements. However, the student is informed the jump will not count if he falls backward. The score recorded is the best jump of three attempts, measured and *recorded in total inches.* Measurements are taken from the back of the take-off line to the back of the heel nearest the take-off line. The scorer should stand to the side of the subject to observe the exact point of contact of the rear heel.
Attempts: 3
Scoring: Best distance recorded in inches

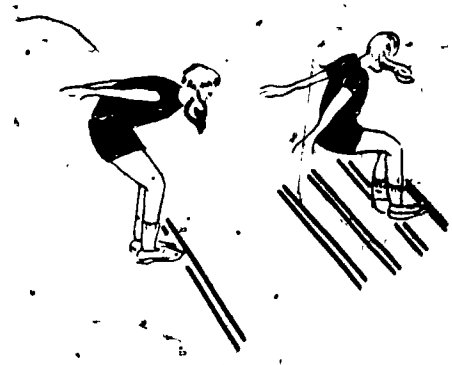


Fig. 2-3 Standing Broad Jump

Test Item No. 4:

200 Yard run; 8-minute run; 12-minute run

Factor: Cardiorespiratory Endurance

a. 200 Yard run, ages 6-11 (grades 1-6)

After demonstration of the sprint start, the subjects are requested to assume the starting position with fingertips behind the starting line. Commands are: "take your mark," "get set," and "go." The instructor should start the the time when the subject "moves" rather than on the command "go." Encourage the students to run at full speed beyond the finish line. If a student does not run as fast as he can, do not record his score, as the time will be invalid. For consistency, run the 200 yard dash in a straight line (preferably on turf). Gym shoes or shoes may be worn; stockings or bare feet are not permitted.

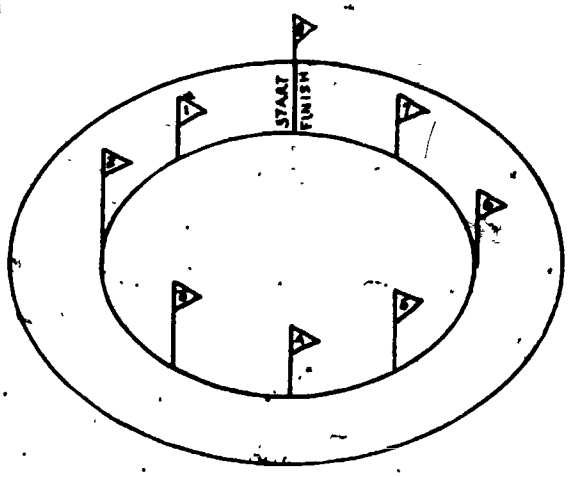
Attempts: 1 or more, if necessary

Scoring: Time in seconds

Fig. 2-4 200 Yard Run

b. 8-Minute run, ages 12-13 (grades 7-8)

(1) Sub-divide the 440 yard track into eight equal sections 55 yards each section. (2) Place a flag marker at each section, e.g., "1," "2," "3," etc. (3) "Pair" all students as "1's" and "2's," prior to testing. (4) On command have all of the "1's" (half the class) run for an 8-minute period. The No. 2's are to keep a record of the distance covered by their partners. (5) At the termination of the 8-minute period, the instructor blows the whistle, terminating the run. The No. 2's report their partner's scores to the recorder, e.g., 3.6 would indicate three complete laps, plus the passing of six markers. (Table 2-1 provides a reliable means for converting laps to yards and miles.) (6) Reverse the procedure and have the No. 2's run and the No. 1's act as recorders.



Attempts: 1

Scoring: Total laps, plus flags passed in 8 minutes

c. 12-Minute run, ages 14-18 (grades 9-12) The same test directions as for the 8-minute run except that the students continue running for a 12-minute period.

Attempts: 1

Scoring: Total laps, plus flags passed in 12 minutes

Scoring procedures. Table 2-1 illustrates the performance scores for an MDL student who, by virtue of his limitations, could only perform the static arm hang and modified sit-ups. The percentile scores may be derived by referring to Appendix C. The lower chart in Table 2-1 provides a simplified procedure for converting percentiles to stanine scores so that the teacher can derive one score which is reflective of the student's physical fitness level, i.e., his Physical Fitness Index (PFI) score.

Township of Ocean Motor Ability Test[1]

General Test Directions:

The tester should observe student performance carefully and record anecdotal remarks for all failures so that an individualized program can be prescribed.[2]

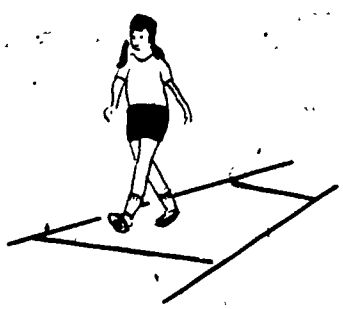
Gross Body Coordination

Test Item No 1: *Walk*

Factor: Gross Body Coordination

Subject must walk at least fifteen feet in a smooth manner. Bilateral coordination of opposite arm and leg is required, i.e., left arm–right foot and right arm–left foot, plus subjective evaluation of gross body coordination.

Attempts: 2 Scoring: Maximum—2 points



Walk

[1] Modified instrument designed by Donald Hilsendager, Harold K. Jack, and Lester Mann, *Basic Motor Fitness Test for Emotionally Disturbed Children*, pp. 7-11.

[2] Should you desire to administer the Motor Ability Test to a child with a medically-oriented problem, be sure you have a medical release form signed by the parent and family or school physician, plus prescriptive activities from the physician.

TABLE 2-1

PHYSICAL FITNESS TEST FORM (Courtesy of the Township of Ocean School District)

NAME Jane Doe AGE 6 INSTRUCTOR David Enderley

SCHOOL Ocean Township School MALE X FEMALE x

GRADE 1 HEIGHT 4'0" WEIGHT 50

STARTED PROGRAM Date September 75

COMPLETED PROGRAM Date _____ SOMATOTYPE Endo-Mesomorph

TEST ITEM	FACTOR	RAW SCORE			PERCENTILE			STANINE		
		Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Static Arm Hang	Arm Strength	10			35			5		
Modified Sit-Ups	Abdominal Strength	2			4			2		
Standing Broad Jump	Leg Strength									
200 Yard[1] Dash	Endurance									
8-Minute[2] Run	Endurance									
12-Minute[3] Run	Endurance									
	Number of Tests							Total Points		
TOTALS	4							7		

PFI = $\frac{\text{Total Stanines} \times 10}{\text{Number of Tests}}$ $\frac{7 \times 10}{2} = 35$ PFI Score

Anecdotal Remarks

Paralysis of lower part of body (paraplegia) — Cannot perform the standing broad jump and endurance test.

Table for Converting Percentiles to Stanines

Percentile Intervals	Stanines	
97 and above	9	Very High
90–96	8	
80–89	7	High
65–79	6	
35–64	5	Average
20–34	4	Low
10–19	3	
4–9	2	Very Low
3– and below	1	

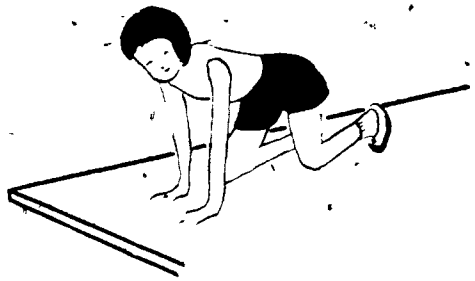
[1] Administered to students, ages eleven and below

[2] Administered to students, ages twelve and thirteen

[3] Administered to students, ages fourteen and above.

Test Item No. 2: *Creep*
Factor Gross Body Coordination

Bilateral coordination of opposite hand and knee is required, i e , left hand–right knee must come forward at the same time and right hand–left knee must come forward at the same time. Subject must creep (hands and knees) at least ten feet (5 x 10 mat) to pass
Attempts. 2 Scoring. Maximum–2 points

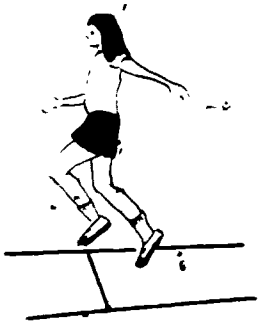


Creep

Test Item No 3 *Climb-stairs*
Factor Gross Body Coordination

Subject must climb at least four consecutive steps (twelve inches high) by using alternate footwork Both feet must not come together on a step, but rather one foot on one step and the next step with the other foot, no support may be given (Corridor stairs may be used)
Attempts 2 Scoring Maximum–2 points

Climb Stairs



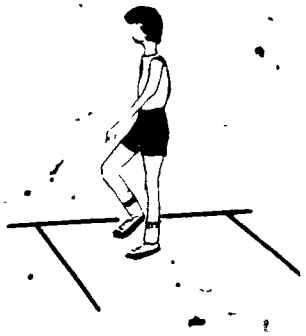
Skip

Test Item No 4: *Skip*
Factor: Gross Body Coordination

Subject must skip at least ten feet in a smooth manner (without extra hops). One practice attempt shall be permitted
Attempts. 2 Scoring. Maximum–2 points

Test Item No 5 *March-in-place*
Factor. Gross Body Coordination

To pass, the subject must keep in cadence with the tester who claps cadence of one clap per second (15 seconds) for the first attempt and two claps per second (15 seconds) for the second attempt
Attempts. 2 Scoring. Maximum–2 points



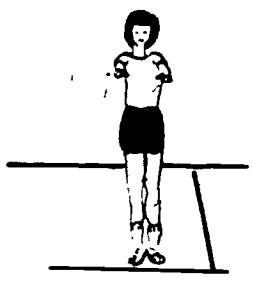
March-In–Place

Subject's score on gross body coordination is the number of successful accomplishments in ten attempts All of the gross body coordination skills should evidence total body coordination for a passing attempt
Maximum total points–Gross Body Coordination–10 points

BALANCE AND POSTURAL ORIENTATION

Test Item No 1. *Stand–both feet*
Factor. Balance and Postural Orientation

Subject must stand with feet together, arms extended forward from shoulders at a 90 degree angle and eyes closed for fifteen seconds. An unsuccessful attempt is recorded if the subject shifts his feet, or moves arms 15 degrees from the 90 degree position
Attempts. 3 Scoring. Maximum–3 points

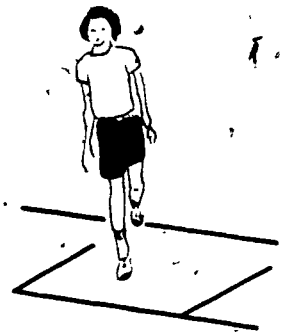


Stand–Both Feet

Test Item No. 2 *Stand right foot*
Factor: Balance and Postural Orientation

Subject must stand on right foot with left foot off the floor and not touch any stable object for fifteen seconds (eyes open). Unsuccessful attempt if subject shifts right foot or touches left foot to right leg, foot, floor, or any other supporting structure before the elapse of fifteen seconds.

Attempts: 3 Scoring: Maximum—3 points

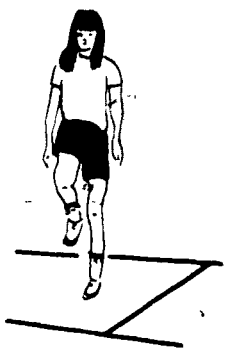


Stand—Right Foot

Test Item No 3 *Stand—left foot*
Factor Balance and Postural Orientation

Same directions as for test item number 2 except feet are reversed

Attempts. 3 Scoring: Maximum—3 points

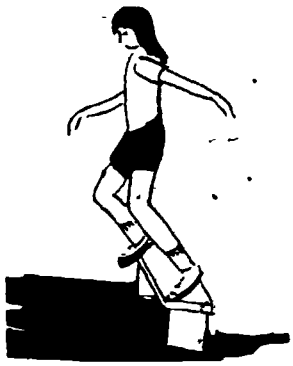


Stand—Left Foot

Test Item No. 4. *Jump—one foot leading*
Factor: Balance and Postural Orientation

Subject must jump off eighteen-inch high step or bench with one foot in front of the other. No support is allowed and balance must be maintained on landing (no shift of feet) .The tester should have the subject jump and land in an area immediately adjacent to the bench

Attempts 3 Scoring: Maximum—3 points

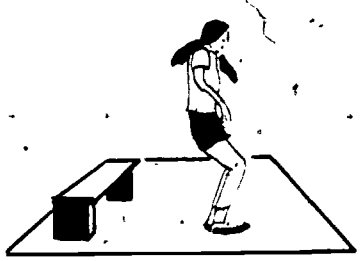


Jump—One Foot Leading

Test Item No 5 *Jump—both feet simultaneously*
Factor Balance and Postural Orientation

Same procedure as test item number 4 except feet are side by side.

Attempts: 3 Scoring. Maximum—3 points



Jump—Both Feet Simultaneously

Test Item No 6: *Stationary jump—both feet*
Factor Balance and Postural Orientation

Subject must jump on both feet for at least three jumps without stopping, losing balance, using a support, or stepping on, or out of an 18" square

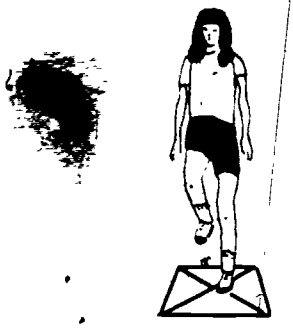
Attempts: 3 Scoring: Maximum—3 points

Stationary Jump—Both Feet

Test Item No. 7: *Stationary hop left foot*
Factor: Balance and Postural Orientation.

Subject must hop on left foot for at least three hops without stopping, losing balance, using a support, or stepping on, or out of an 18" square.

Attempts. 3 Scoring: Maximum—3 points



Stationary Hop—Left Foot

Test Item No 8 *Stationary hop—right foot*
Factor: Balance and Postural Orientation

Same procedure as test item number 7 except the subject hops on right foot.

Attempts: 3 Scoring: Maximum—3 points

Stationary Hop—Right Foot

Subject's composite score on Balance and Postural Orientation is the number of successful accomplishments in twenty-four attempts

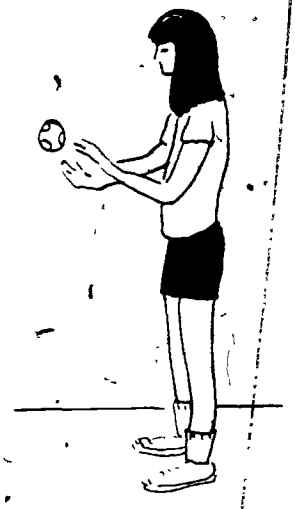
Maximum total points—Balance and Postural Orientation—24 points

EYE AND HAND COORDINATION

Test Item No 1 *Catch*
Factor: Eye and Hand Coordination

To pass, the subject must catch a whiffleball (the circumference of a softball) using only his hands Juggling the ball, having it strike any part of the body, other than the hands, or dropping the ball, constitutes a failure. The toss must be from a distance of eight feet and thrown in a soft, underhand manner. The trajectory should be such that it does not rise higher than the subject's head and reaches the receiver at chest level.

Attempts. 3 Scoring: Maximum—3 points.

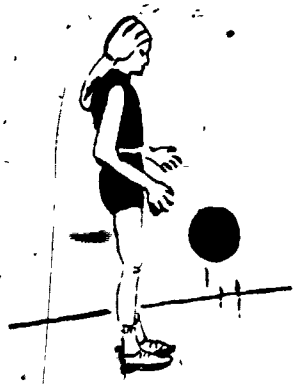


Catch

Test Item No 2 *Ball bounce and catch*
Factor: Eye and Hand Coordination

The student must drop or push an eight inch diameter utility ball to the ground and catch it on the rebound immediately, no intervening bounces are permitted. Juggling the ball, having it strike any part of the body (other than the hands), or a drop, constitutes a failure

Attempts: 3 Scoring: Maximum—3 points



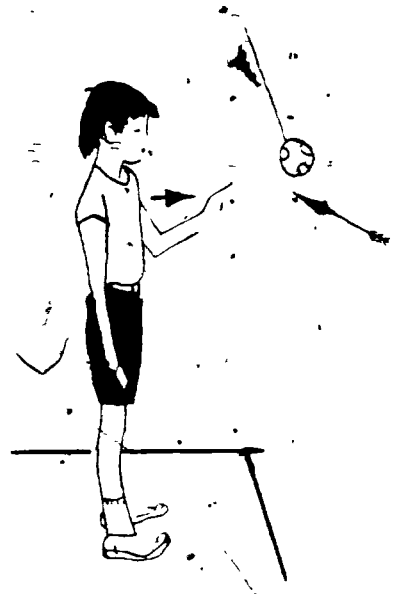
Ball Bounce and Catch

Test Item No. 3 *Touch ball swinging laterally*
Factor: Eye and Hand Coordination

With dominant hand on shoulder (palm down, index finger extended and hand motionless), the subject on command "touch" must touch laterally swinging whiffleball (softball circumference) with the index finger on the side of the ball. The instructor holds the whiffleball suspended on an 18" cord at mid-chest level and proceeds to

swing the ball laterally. Commands are issued (1) when the ball is at full arm extension across the midline, (2) when the ball is at the midline, and (3) when the ball is at full arm extension on the dominant side of the midline. An unsuccessful attempt is recorded if the subject delays response, touches the ball with other than the index finger, misses, or moves his head.

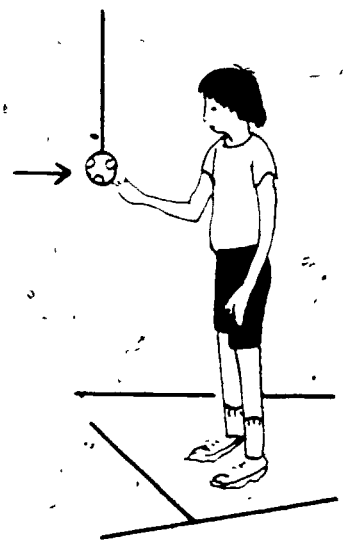
Attempts 3 Scoring Maximum—3 points



Touch Ball Swinging Laterally

Test Item No 4 *Touch ball swinging fore and aft*
Factor Eye and Hand Coordination

With dominant hand on hip (palm up, index finger extended and head motionless), the subject on command "touch" must touch fore and aft swinging whiffleball (softball circumference) with index finger on the under surface of the ball. The instructor holds the whiffleball



Touch Ball Swinging Fore and Aft

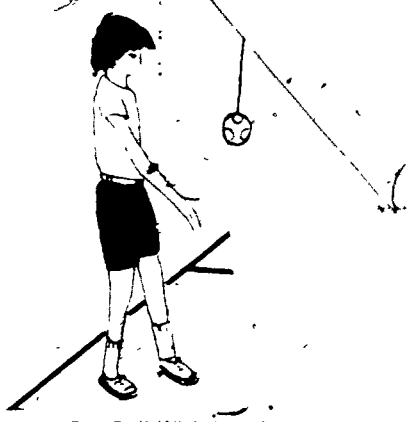
suspended on an 18" cord at midchest level and, issues commands: (1) when the ball is at full arm extension, (2) when the ball is at midpoint, and (3) when the ball is closest to the subject. An unsuccessful attempt is recorded if the subject delays response, touches the ball with other than the index finger, misses, or moves his head.

Attempts: 3 Scoring. Maximum—3 points

Test Item No 5 *Bat ball with hand*
Factor Eye and Hand Coordination

Same procedure as test item number 4 except the subject bats the ball with an open hand held in readiness between the waist and shoulder. An unsuccessful attempt is recorded if some part of the hand does not touch some part of the ball.

Attempts 3 Scoring Maximum—3 points



Bat Ball With Hand

Test Item No 6 *Bat ball with bat*
Factor Eye and Hand Coordination

Same procedure as test item number 4 except the subject bats the ball with a plastic whiffleball bat which is held in readiness between the waist and the shoulder. An unsuccessful attempt is recorded if some part of the bat does not touch some part of the ball.

Attempts. 3 Scoring Maximum—3 points

Bat Ball With Bat

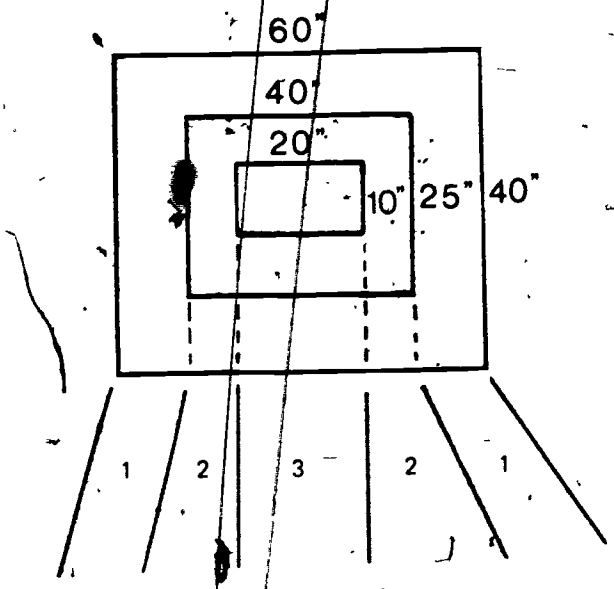
Maximum total points—Eye and Hand Coordination—18 points

EYE AND HAND ACCURACY

Test Item No 1 *Throw—right hand*
Factor: Eye and Hand Accuracy

The subject throws a whiffleball (softball circumference) at a modified version of the Johnson Target Test.[1] (See illustration below) The subject may use either an overhand or underhand throwing motion, minimum throwing distance—ten feet The ball must hit the target without previously touching the floor for a correct attempt Scoring 3 points, inner rectangle and line, 2 points, middle rectangle and line, 1 point, outer rectangle and line

Attempts. 3 Scoring: Maximum—9 points



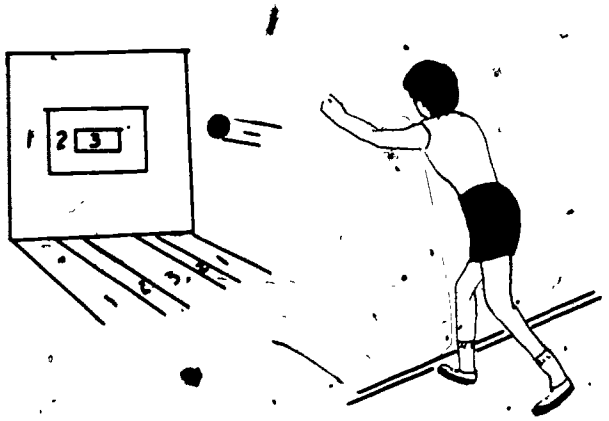
Johnson Target Test

Throw—Right Hand

Test Item No 2: *Throw—left hand*
Factor Eye and Hand Accuracy

Same procedure as test item number 1 except that subject throws with the left hand

Attempts: 3 Scoring: Maximum—9 points



Throw—Left Hand

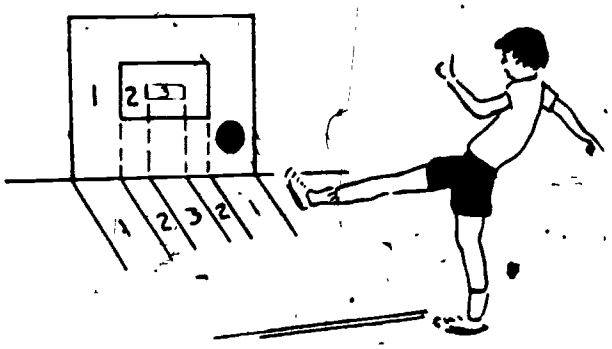
Maximum total points—Eye and Hand Accuracy—18 points

EYE AND FOOT ACCURACY

Test Item No 1 *Kick—right foot*
Factor: Eye and Foot Accuracy

Same procedure as test item number 1 above except the subject kicks stationary volleyball at the target with his right foot and the ball may touch the floor prior to contacting the target.

Attempts: 3 Scoring: Maximum—9 points



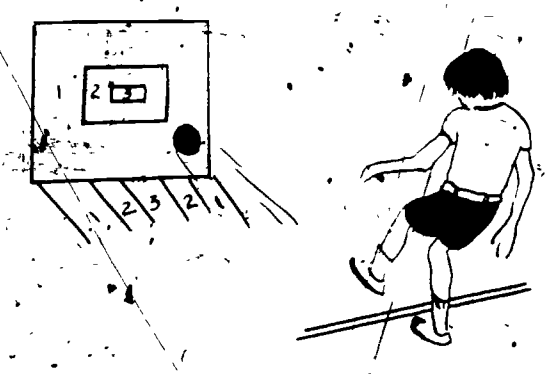
Kick—Right Foot

Test Item No. 2: *Kick—left foot*
Factor: Eye and Foot Accuracy

Same procedure as test item number 1 except the subject kicks stationary volleyball with his left foot.

Attempts. 3 Scoring: Maximum—9 points

[1] L. William Johnson, "Objective Test in Basketball for High School Boys"



Kick—Left Foot

Subject's composite score on eye and foot accuracy is the total number of points scored in six attempts

Maximum total points—Eye and Foot Accuracy—18 points

Maximum Grand Total—88 points

Scoring procedure. Table 2-2 provides the motor performance scores of a student who is confined to a wheelchair. Consequently, he could only be tested in two areas — eye-hand coordination and eye-hand accuracy. His total stanine score (12) can be converted to his Motor Ability Index (MAI) by referring to Appendix D.

Muscle Girth, Strength Decrement Index (SDI) and Range of Motion

Muscle girth. Muscle girth is determined by measuring the "contracted" muscle three times with a metal measuring tape and recording the most representative measurement. The tape is applied at right angles to the length of the muscle, at the point of greatest circumference; a permanent landmark is selected and recorded for accuracy of test and retest. In order to obtain accurate data, the exact distance above or below a joint should be measured and recorded as a reference point to be used when retesting.

Strength decrement index (SDI). The SDI score is reflective of a student's tolerance to tasks involving muscular strength. Positive scores indicate the ability to perform tasks requiring greater muscle stress; negative scores are indicative of muscular fatigue. The test procedure involves: isolating a muscle or muscle group; pre-testing to determine initial muscle strength at the beginning of the class period; conducting an exercising regime; and post-testing at the end of the class period. The formula to determine the SDI is:[1]

$$SDI = \frac{S_b - S_a}{S_b} \times 100$$

Symbols:

S_b = strength before

S_a = strength after

[1] H. Harrison Clarke et al, "Strength Decrement Index," p. 376.

Range of motion. Range of motion is measured at nine-week intervals by use of the goniometer, or the Leighton flexometer. The international standard goniometer consists of a protractor and two plastic arms hinged together. The axis of the instrument is placed as close as possible to the functional axis of the body; the "fixed arm" is then placed in line with the stabilized part of the body, and the movable arm follows and measures the motion of the body part. The Leighton flexometer is another instrument for measuring range of motion. It is strapped to the moving part under testing, and a circular disc is locked in place at that point. After the range of motion has been completed a pointer is locked in place to indicate the amount of joint flexibility.[2]

The data is then recorded on the Range of Motion Assessment Chart, Table 2-3:

The true range of motion can be limited by the following factors which would negate the validity of the measurement, hence careful observations must be made.

1. tension of muscles
2. tension of ligaments
3. apposition of boney surfaces
4. compression of fibrocartilages
5. contact of organs against bone
6. contact of an extremity against the body
7. contact of one extremity against another extremity
8. tension of skin
9. contact of one muscle against another muscle

Student learning experience: working in pairs measuring muscle girth, SDI, and range of motion.

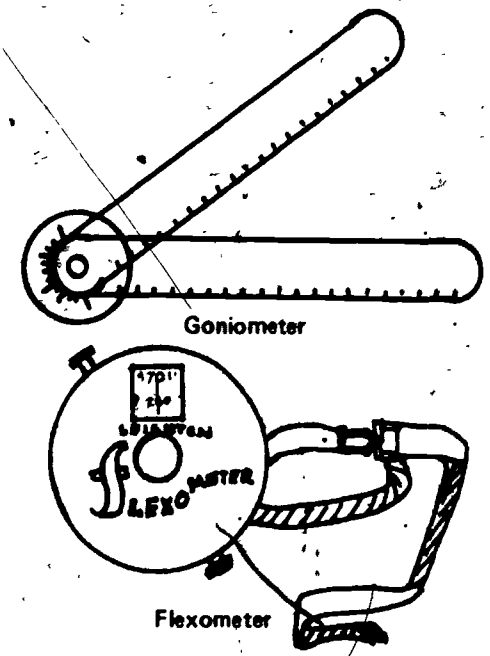


Fig. 2-2 Range of Motion Test Instruments

[2] Thomas M. Vodola, *Individualized Physical Education Program for the Handicapped Child*, pp. 83-84.

TABLE 2-2

MOTOR ABILITY TEST FORM

NAME Doe (Last) John (First) 6 (Age) 1 (Grade) Wanamassa (School) M (Sex)

HANDEDNESS: R ___ L ___ FOOTEDNESS R X L ___

CLASSROOM TEACHER Mrs. Widmann

DATE 9/2/74

WEIGHT 45

HEIGHT 48"

			PRE-TEST				POST-TEST			
TEST ITEM	ATT	FACTOR MEASURED	TRIALS	RS	%	S	TRIALS	RS	%	S
1 Walk	2	Gross Body Coord.								
2 Creep	2	Gross Body Coord								
3 Climb stairs	2	Gross Body Coord								
4 Skip	2	Gross Body Coord								
5 March in-place	2	Gross Body Coord								
TOTAL (Maximum–10 Points)										
1 Stand–both feet (15 sec.)	3	Bal-Post. Orient.								
2 Stand–right foot (15 sec)	3	Bal-Post Orient								
3 Stand–left foot (15 sec)	3	Bal-Post. Orient								
4 Jump–one foot leading	3	Bal-Post Orient								
5 Jump–both feet simultaneously	3	Bal-Post. Orient.								
6 Jump–both feet	3	Bal-Post Orient.								
7 Hop–right foot	3	Bal-Post Orient								
8 Hop–left foot	3	Bal-Post. Orient								
TOTAL (Maximum–24 Points)										
1 Catch	3	Eye-hand Coord	0++	2						
2 Ball–bounce and catch	3	Eye-hand Coord.	+0+	2						
3 Touch ball swg. laterally	3	Eye-hand Coord.	+++	3						
4 Touch ball swg fore/aft	3	Eye-hand Coord	+++	3						
5 Bat ball with hand	3	Eye-hand Coord	0++	2						
6 Bat ball with bat	3	Eye-hand Coord	0+0	1						
TOTAL (Maximum–18 Points)				13	50	5				
1 Throw–right hand	3	Eye-hand Accuracy	0-3-3	6						
2 Throw–left hand	3	Eye-hand Accuracy	1-1-1	3						
TOTAL–Maximum–18 Points)				9	80	7				
1 Kick–right foot	3	Eye-foot Accuracy								
2 Kick–left foot	3	Eye-foot Accuracy								
TOTAL (Maximum–18 Points)										
GRAND TOTAL (Stanine Points)						12				

ANECDOTAL REMARKS

Confined to a wheelchair. Could not perform GBC, BPO and EFA test items. Can support body weight on crutches. Needs practice in crutch-walking.

Symbols

RS = raw score
% = percentile score
S = Stanine score
+ = passed
0 = failed

(Source Hilsendager, D.R , H.K Jack and Lester Mann. *Basic Motor Fitness Test for Emotionally Disturbed and Mentally Handicapped Children*, 1968)

TABLE 2-3

RANGE OF MOTION ASSESSMENT CHART

Joint	Movement	Range of Movement	Date	Date	Date	Date
Shoulder	Flexion	0° - 180°				
	Extension	0° - 45°				
	Adduction	0° - 40°				
	Abduction	0° - 180°				
	Internal Rotation	0° - 90°				
	External Rotation	0° - 90°				
Elbow	Flexion	0° - 145°				
	Extension	0°				
Forearm	Supination	0° - 90°				
	Pronation	0° - 90°				
Wrist	Flexion	0° - 70°				
	Extension	0° - 80°				
	Ulna Deviation	0° - 45°				
	Radial Deviation	0° - 20°				
Hip	Flexion	0° - 125°				
	Extension	0° - 10°				
	Abduction	0° - 45°				
	Adduction	0° - 40°				
	Internal Rotation	0° - 45°				
	External Rotation	0° - 45°				
Knee	Flexion	0° - 140°				
	Extension	0°				
Ankle	Plantar Flexion	0° - 45°				
	Dorsi Flexion	0° - 20°				
	Inversion	0° - 40°				
	Eversion	0° - 20°				

Criterion-Referenced Performance Objectives

Physical educators, under the supervision of a doctor or physical therapist, should provide handicapped students with learning experiences which will aid them in the performance of everyday tasks. The screening instrument below provides a single procedure for ascertaining the skill proficiency of students who are confined to crutches or wheelchairs.

Motor Disability or Limitations Performance Objectives

The Student:	PASS	FAIL
Crutch		
1. Transfers from wheelchair to crutches in one minute.	____	____
2. Transfers from crutches to wheelchair in one minute.	____	____
3. Demonstrates swing-to gait on crutches.	____	____
4. Demonstrates swing-through gait on crutches.	____	____
5. Transfers from floor to crutches in one minute.	____	____
6. Ascends stairs properly (ten), aided by one handrail and crutches.	____	____
7. Descends stairs properly (ten), aided by one handrail and crutches.	____	____
8. Performs a complete turn (360 degrees) to the left in one minute (crutches).	____	____
9. Ambulates a minimum of forty-eight feet in twenty seconds (crutches).	____	____
10. Performs a complete turn (360 degrees) to the right in one minute (crutches).	____	____
Wheelchair		
1. Transfers from wheelchair to chair in one minute.	____	____
2. Transfers from chair to wheelchair in one minute.	____	____
3. Performs a complete turn (360 degrees) to the right in one minute (wheelchair).	____	____
4. Performs a complete turn (360 degrees) to the left in one minute (wheelchair).	____	____
5. Performs a complete turn to the right without touching the lines of a circle that has a diameter of six feet (wheelchair). (See Fig. 2-3 on p. 18).	____	____
6. Performs a complete turn to the left without touching the lines of a circle that has a diameter of six feet (wheelchair).	____	____
7. Propels wheelchair forward and backward and stops on command.	____	____
8. Traverses 200 feet in 20 seconds.	____	____
9. Opens and closes a door in one minute.	____	____
10. Opens and closes a desk drawer in one minute.	____	____

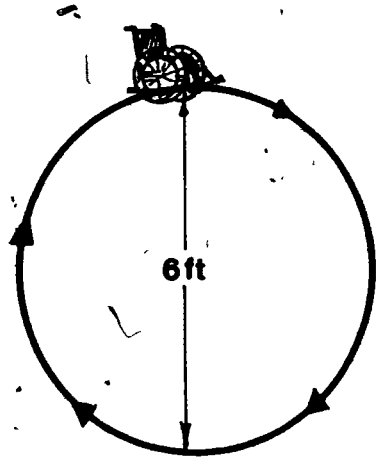


Fig. 2-3 Wheelchair Maneuver

Self-Concept Instrument

The School Sentiment Index: Primary Level[1,2] has been devised to assess the attitude of students toward various aspects of the school program. It is recommended the instrument, or some section(s) thereof, be administered to students in the D&A Program on a pre-post test basis. A more sophisticated study might be to compare the post-test performance between a random sample of students in the D&A Program, and those in the regular physical education program. Sub-scales that might be compared would include: teacher-pupil rapport; pupil-pupil rapport; and social structure and climate.

Description and rationale. This inventory consists of 37 questions to be read orally by the administrator. Pupils respond to each question by marking "yes" or "no" on specially-designed response sheets.

This self-report device attempts to secure, in a rather straightforward fashion, a child's responses to questions which pertain to five aspects of attitude toward school. Examples of each dimension (for which subscale scores may be obtained) are: (1) *Teacher:* "Is your teacher interested in the things you do at home?" (2) *School Subjects:* "Do you like to write stories in school?" (3) *School social structure and climate:* "Does your school have too many rules?" (4) *Peer:* "Do you like the other children in your class?" (5) *General:* "Is school a happy place for you to be?" From these examples it can be seen that if a child wished to answer untruthfully, in such a way that he would be viewed in a better light, it would not be too difficult to do so. Such tendencies to supply false responses can be minimized by utilizing as administrator a person other than the classroom teacher, and by administering the measure in such a way that the anonymity of the respondent is both real and perceived.

[1] Attitude Toward School, Grades K-12, Revised Edition (Los Angeles, California: Instructional Objectives Exchange, 1972), pp. 35-46. Permission to publish granted.

[2] Additional attitude and self-concept instruments are included in the other ACTIVE manuals for students K-12.

Items representing each of the subscales are as follows:

Teacher: Items 1, 3, 7, 10, 16, 25, 27, 29
School Subjects: Items 9, 13, 14, 17, 19, 20, 33
Social Structure and Climate: Items 8, 12, 18, 21, 26, 36, 37
Peers: Items 2, 4, 11, 22, 23, 30, 31, 32
General: Items 5, 6, 15, 24, 28, 34, 35

Directions for administration. *The School Sentiment Index* may be administered in a variety of ways:

1. The entire 37 items may be administered and a single score obtained, yielding a global estimate of attitude toward school.
2. The 37 items may be administered, but those representing each subscale scored separately, yielding information on the attainment of each objective.
3. Items in a subscale representing particular objectives of interest may be administered and scored separately.

The questions in the *School Sentiment Index* are to be read orally to the children; pupils respond by marking "yes" or "no" on the response sheets provided. Children of kindergarten age and above have been able to complete the measure in approximately 10-15 minutes, when the recommended practice activities have been used.

The following practice activities should be used prior to beginning the instrument to ensure that the children understand the procedure for indicating their responses:

1. On the chalkboard, draw a series of response boxes similar to those on the response sheets:

Yes	No	Yes	No
Yes	No	Yes	No
Yes	No	Yes	No

(Do not distribute the actual response sheets until you are ready to begin the measure.)

2. Clearly identify for the children the written words "yes" and "no." Have individual children identify the words; confirm the correctness of each child's responses.
3. Demonstrate the proper marking of the responses. Emphasize that only one word is to be marked in each box.
4. Have different children come to the board to answer as many of the following practice items as are deemed necessary. With children who can already discriminate between "yes" and "no" responses, few, if any, of these practice exercises may be needed.
   a. Are you a child?
   b. Are you a train?
   c. Do you have a brother?
   d. Do you like to sing?
   e. Do birds fly?
   f. Do you have a dog?

To complete the measure, each child will need the following materials:

1. Three response sheets, each of a different color (for purposes of scoring as well as ease of administration) and each containing ten response boxes. It may be helpful to fold each sheet in half lengthwise, printed side out, so children see only one column at a time.
2. A pencil or crayon.

Two methods of identifying the response boxes are provided. The pictures on the left in each box may be used with children who are unable to identify the numerals 1-40. If the pictures are used, they should be identified before beginning the instrument. The pictures are: face, star, bell, cat, telephone, flower, clown, house, dog, umbrella. When administering the instrument, the administrator should check on each item to make sure children are responding "in the box with the ..." Children who are able to read numerals may prefer to use these rather than the pictures; numerals are located in the upper righthand corner of each box. The administrator should identify the correct numeral before and after reading each question.

Remind the children that for many questions, either answer *may* be correct although only one answer will be correct for a particular child Therefore, they need not worry if another child's response is different from their own.

Do not permit the children to verbalize their answers when responding.

In some cases, administration may be easiest if conducted with a small group of students at a time, rather than with the entire class at once.

Scoring. Pupils will receive one point for each positive response, that is, for each "yes" or "no" response which indicates

1. favorable attitude toward teacher (teacher subscale).
2. favorable attitude toward activities in various subject areas (school subjects subscale).
3. favorable attitude toward the social structure and climate of the school (social structure and climate subscale).
4. favorable attitude toward peer relations in the school context (peer subscale).
5. favorable attitude toward the general notion of "school" (general subscale).

Responses to be scored as positive are indicated in the *scoring guide*. Scoring templates may be prepared by cutting out the positive responses on an answer sheet, and student responses on an answer sheet, and student responses scored by placing the template over the student's response sheet.

Pupil scores may be obtained by counting the number of positive responses given by each pupil, for the entire measure or for a particular subscale. An average score for a group of pupils may be computed by summing the pupils' individual scores and dividing by the number of pupils in the group.

Scoring Guide

1.	yes	19.	yes
2.	no	20.	yes
3.	yes	21.	no
4.	no	22.	no
5.	yes	23.	yes
6.	no	24.	no
7.	no	25.	no
8.	yes	26.	yes
9.	yes	27.	no
10.	no	28.	yes
11.	yes	29.	no
12.	no	30.	no
13.	yes	31.	yes
14.	yes	32.	yes
15.	yes	33.	yes
16.	yes	34.	no
17.	yes	35.	no
18.	yes	36.	yes
		37.	yes

SCHOOL SENTIMENT INDEX

Primary Level

Questions:

(face)	1. Is your teacher interested in the things you do at home?
(star)	2. When you are trying to do your schoolwork, do the other children bother you?
(bell)	3. Does your teacher care about you?
(phone)	4. Do other children get you into trouble at school?
(flower)	5. Do you like being at school?
(clown)	6. Would you be happier if you didn't have to go to school?
(house)	7. Does it bother you because your teacher doesn't give you enough time to finish your work?
(dog)	8. Are the grown-ups at school friendly toward the children?
(umbrella)	9. Do you like to read in school?
(face)	10. When you don't understand something, are you usually afraid to ask your teacher a question?
(star)	11. Are the other children in your class friendly toward you?
(bell)	12. Are you scared to go to the office at school?
(cat)	13. Do you like to paint pictures at school?
(flower)	14. Do you like to write stories in school?
(clown)	15. Is school fun?
(house)	16. Does your teacher like to help you with your work when you need help?
(dog)	17. Do you like doing arithmetic problems at school?
(umbrella)	18. Are the rooms in your school nice?
(face)	19. Do you like to learn about science?
(star)	20. Do you like to sing songs with your class?
(bell)	21. Does your school have too many rules?
(cat)	22. Do you usually do what other children want to do instead of what you want to do?
(phone)	23. Do you like the other children in your class?
(flower)	24. Would you like to be somewhere other than school right now?
(clown)	25. Does your teacher like some children better than others?
(house)	26. Do other people at school really care about you?
(dog)	27. Does your teacher yell at the children too much?
(umbrella)	28. Do you like to come to school every day?
(face)	29. Does your teacher get mad too much?
(star)	30. Do you feel lonely at school?
(bell)	31. Do you have your own group of friends at school?
(cat)	32. Do your classmates listen to what you say?
(phone)	33. Do you like to learn about other people?
(flower)	34. Do you wish you could stay home from school a lot?
(clown)	35. Is school boring?
(house)	36. Are there a lot of things to do at school?
(umbrella)	37. Do nice things happen at your school every day?

(Color A)

1

YES NO

6

YES NO

2

YES NO

YES NO

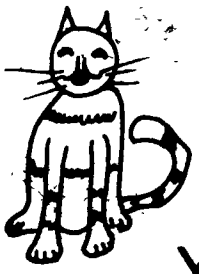
3

YES NO

8

YES NO

4



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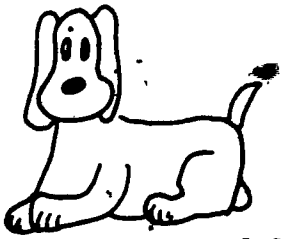

YES NO

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YES NO

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YES NO

21

11

YES NO

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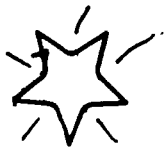

YES NO

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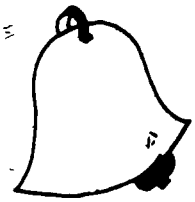

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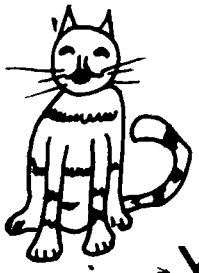

YES NO

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YES NO

(Color B)

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YES NO

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YES NO

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YES NO

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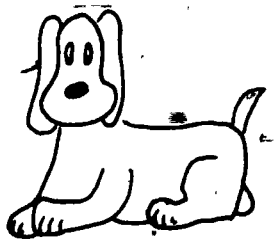

YES NO

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YES NO

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YES NO

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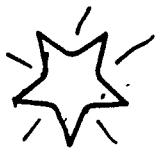

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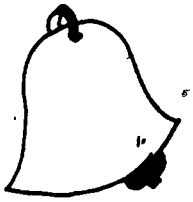

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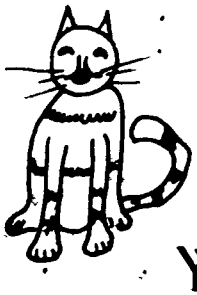

YES NO

25

YES NO

(Color C)

26

YES NO

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YES NO

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YES NO

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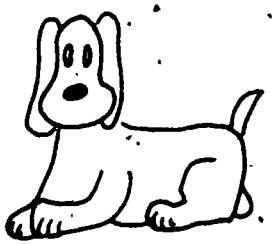

YES NO

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YES NO

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YES NO

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YES NO

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YES NO

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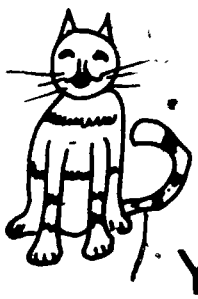
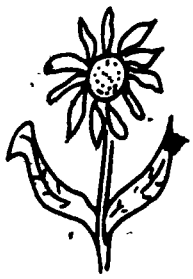


YES NO

35

YES NO

(color D) 36



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YES NO

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YES NO

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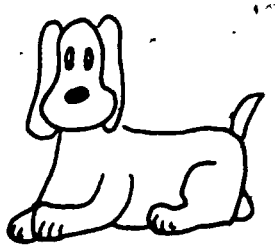

YES NO

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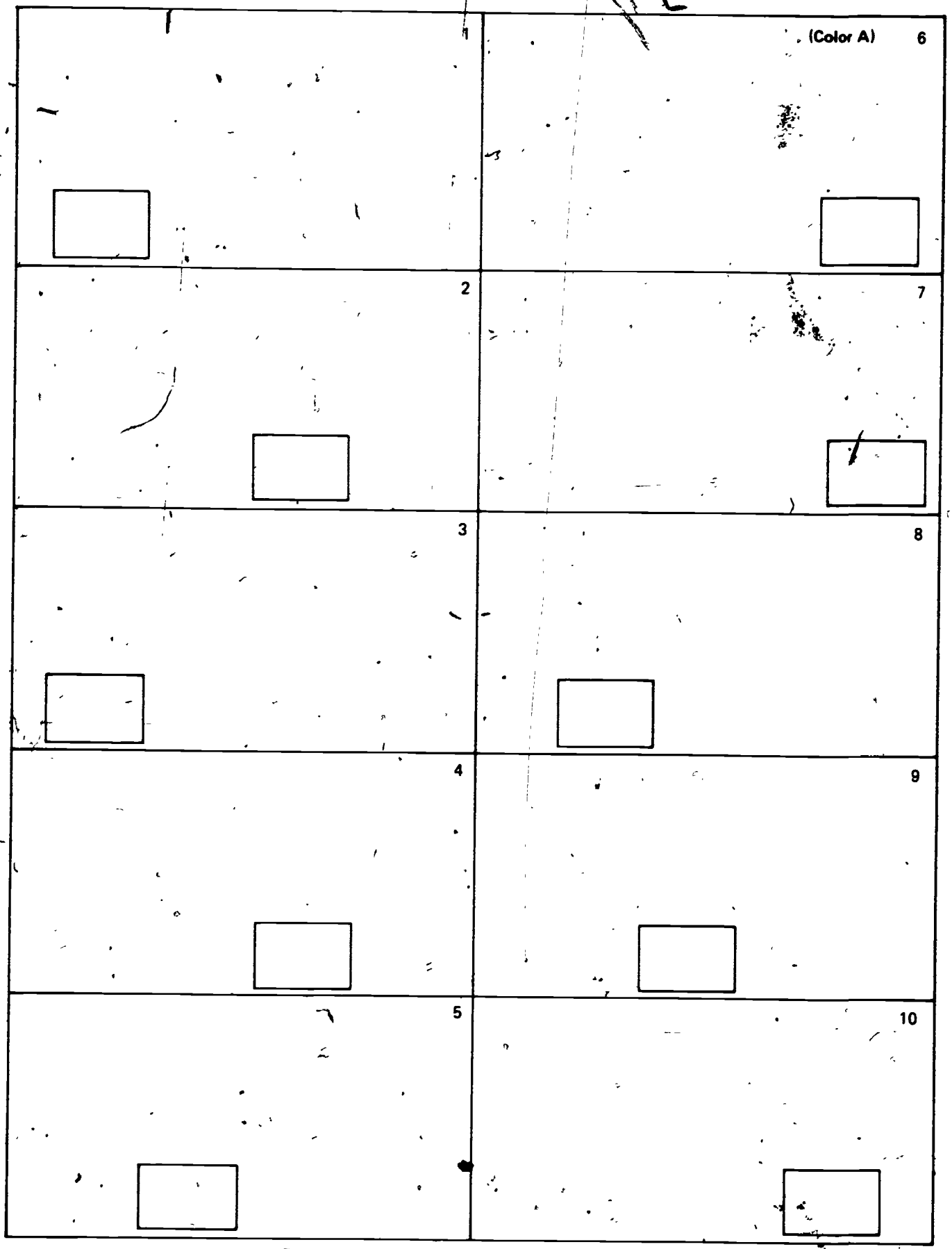
YES NO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(Color A)
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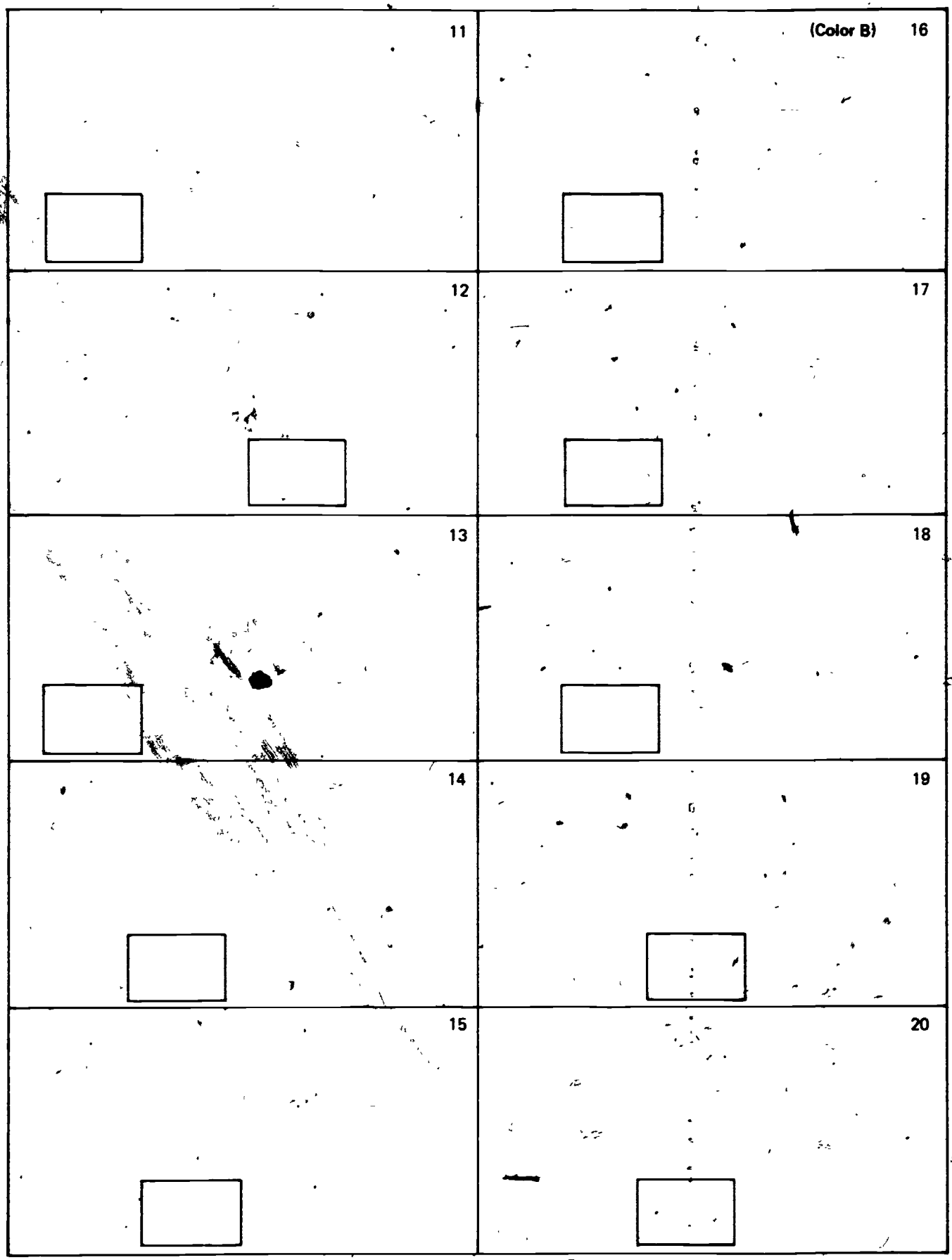
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(Color B) 16
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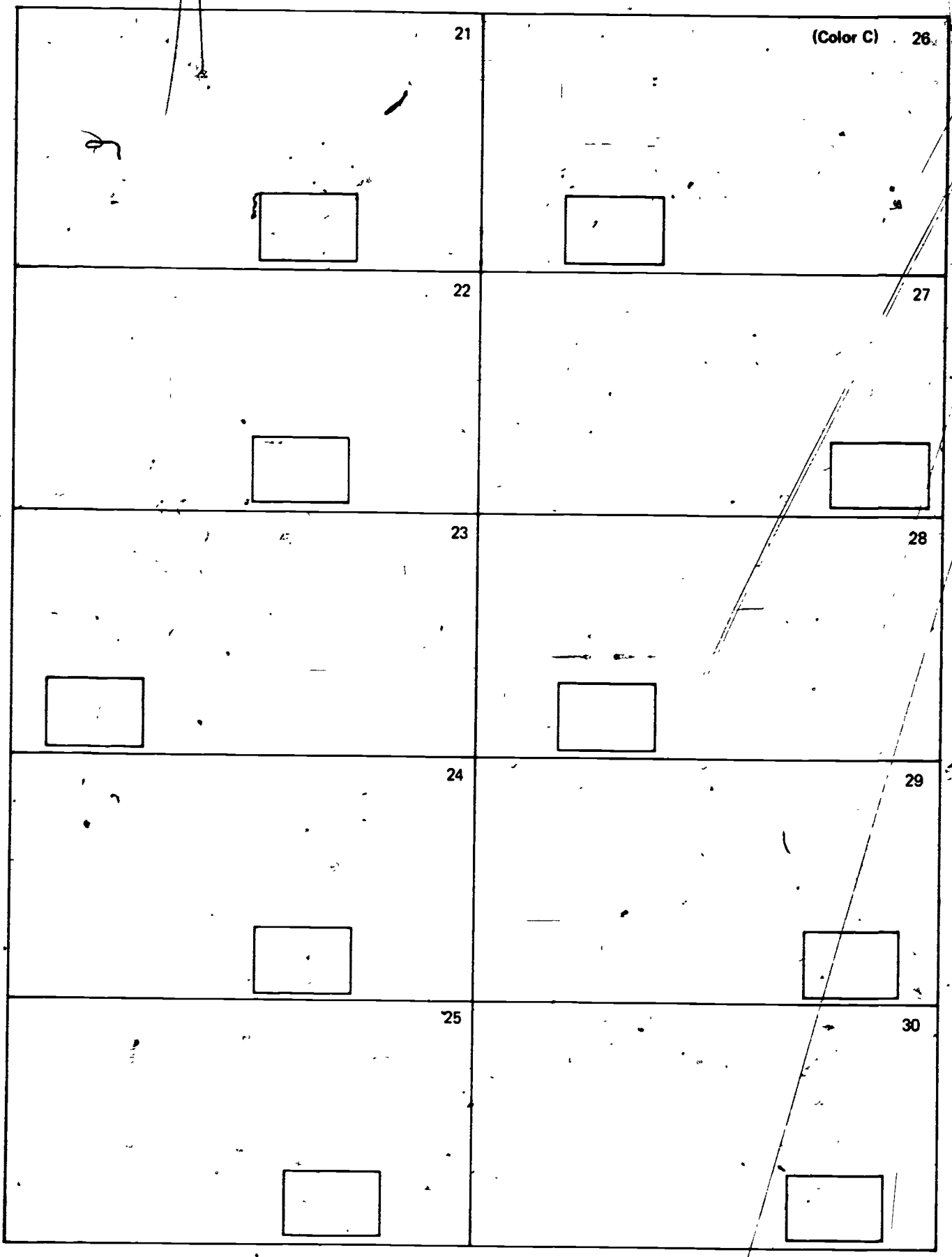
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(Color C) 26
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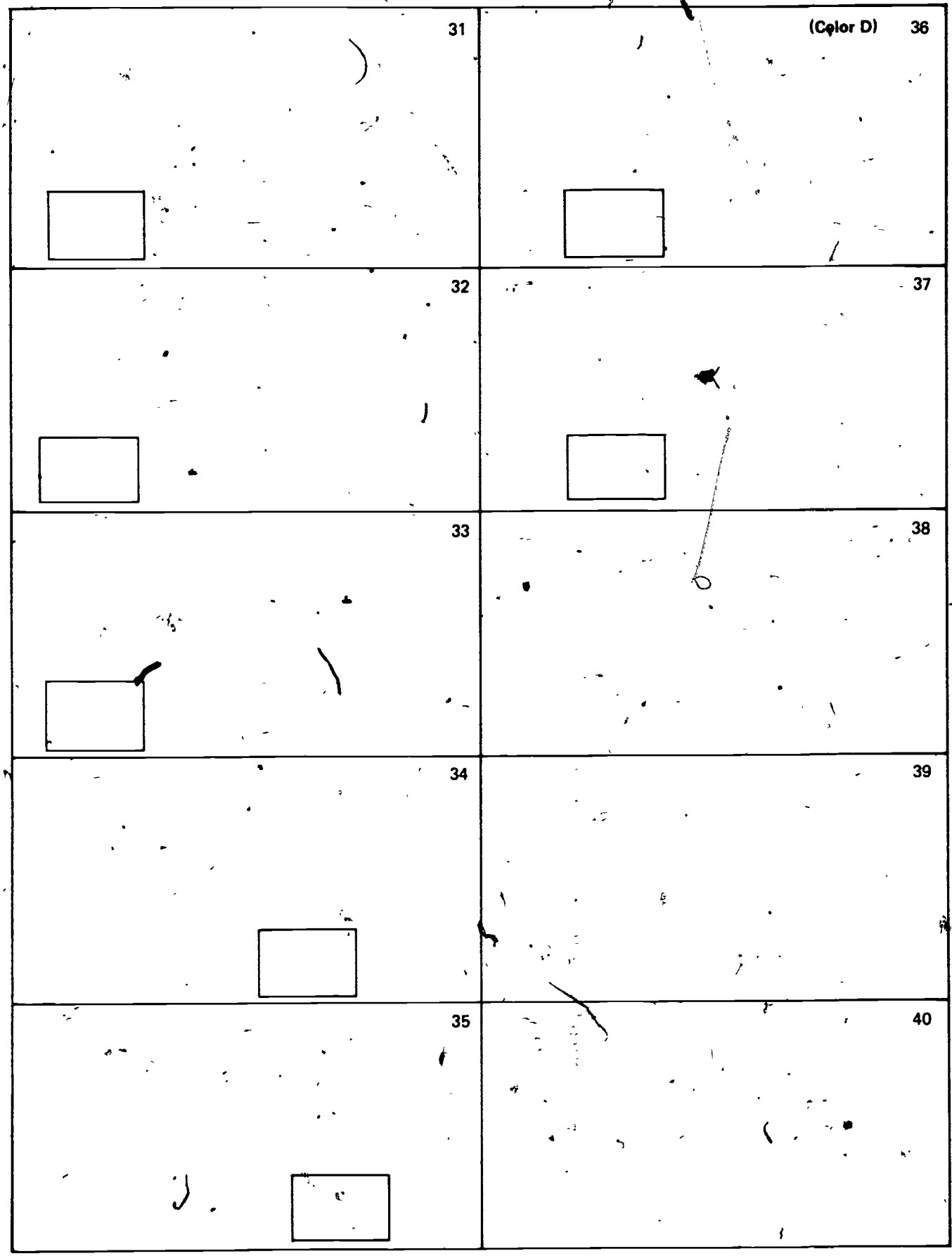
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(Color D) 36
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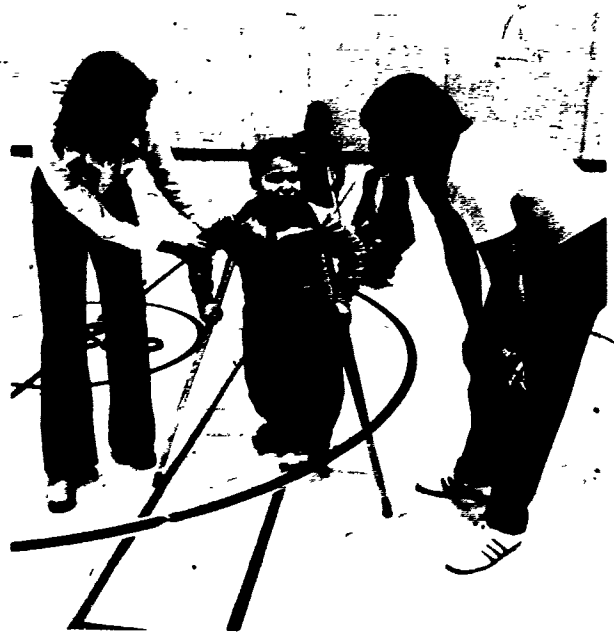
ASSESSMENT PROCEDURES

Crutch-Walking Skills

Observe "gait" for proper weight-bearing; note foot and crutch placement in climbing and descending stairs, walking, etc.



Assessing Student Performance.

Assessing Teacher Performance

Fig. 2-4 Crutch-Walking Skills

(Training Programs Monmouth College, West Long Branch, N.J., and West Elementary School, Slayton, Minnesota)

Objective Appraisal

Review all objective data garnered via administration of: the motor ability test; the physical fitness test; crutch and/or wheelchair items; and self-concept test.

Subjective Appraisal

Carefully observe student performance during all evaluative procedures. For better insight into the prescriptive needs, record anecdotal remarks that focus on the process – how the individual performs the skill. It is particularly important to observe how the child performs the tasks of daily living. For example, does the child with a disability in one arm use both arms in performing an activity? Note how responsive the child is to physical activity both in and out of class; keep a record of the activities in which he voluntarily participates.

PRESCRIPTION PROCEDURES

The problems manifested by children with motor disabilities and limitations are so diverse that it is difficult to present a specific, definitive activity for each disability. The teacher must analyze each child's behavior – his strengths and weaknesses – and prescribe accordingly. Each prescriptive program should include not only exercises intended to remedy the problem, but also modified games and activities. The following material is presented as a guide:

Exercises for Orthopedic Problems

All activities following an injury should be initiated only with a physician's approval.

Hip injury. Dislocation usually occurs when the hip is adducted and a force is applied upward drawing the head of the femur out of the socket. Abduction exercises are needed to strengthen the gluteus medius and give the femur more stability in the socket.

Extension exercises are needed to give greater stability, and general strength to the gluteus maximus. Check other leg for strength and range of motion (ROM). (See Chapter IV General Therapeutic Exercises: Exercises for the Hip.)

Knee injury.

1. Quadriceps setting (contracting the quadriceps with no limb movement). If the student finds this difficult, proprioception will be enhanced if the teacher presses gently, but firmly, downward (toward the toes) on the patella. At the same time, tell the student to pull the patella upward (toward himself).
2. When the prescription calls for quadriceps exercises, use an iron boot or sandbags attached to the foot of the injured leg. The weight should be such that the student is able to perform ten repetitions through the full range of motion. Stress maximum extension at the knee joint with each repetition and a dorsiflexed ankle to stretch the gastroc-soleus, if neces-

sary. Progressively increase resistance until the student can perform three sets of ten repetitions with a maximum resistance of at least 3/4 that of the good leg. It is suggested that a footrest be utilized to eliminate stress on the flexed joint.

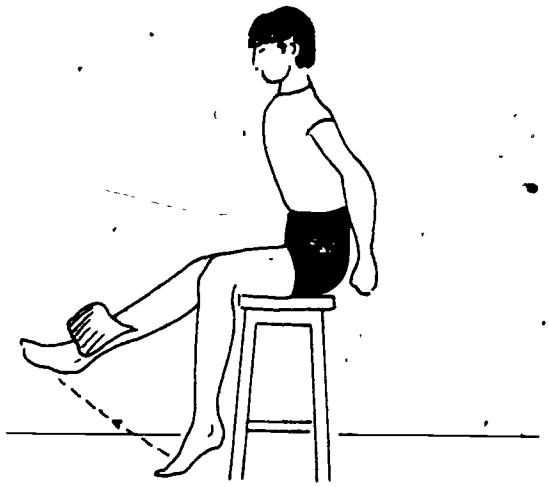


Fig. 2-5 Quadriceps Exercise

3. Stationary bicycle with variable resistance is an excellent exercise for quadriceps and gluteals
4. Always exercise the knee flexors or hamstrings (semi-membranosis, semi-tendenosis and biceps femoris) as well as the knee extensor (quadriceps) This may be accomplished in a prone position using weights or pulleys for resistance or in a sitting position using pulleys as resistance. (Refer to Chapter IV, General Therapeutic Exercises Exercises for the Knee.)

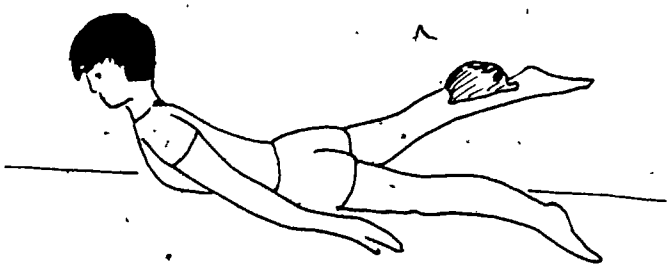


Fig. 2-6 Knee Flexion

Sprained ankle. The most common injury is that in which the ankle is inverted excessively – usually suddenly Exercises are, therefore, aimed at stretching the evertors and strengthening the invertors (peroneals). No resistive exercise should be initiated until all pain and swelling have disappeared.

1. Passive exercise plantar flexion, dorsi flexion, circumduction followed by active motion.
2. Resistive exercises for inversion and eversion with dorsi flexion.
3. When student can go through complete R.O.M. without discomfort, jogging, skipping rope, and other activities may be added. (See Chapter IV, General Therapeutic Exercises: Exercises for Ankle and Foot.)

Dislocated shoulder.

1. Stimulate all shoulder movements, particularly circumduction. This is usually pain free if the individual flexes at the waist, so that the trunk is almost parallel to the floor, allowing the affected arm to swing in circles, clockwise and counter-clockwise. This is an excellent beginning exercise.
2. Active flexion and abduction of the shoulder carried out in the standing position through full R.O.M. This should be followed by resistive exercises using pulleys or light weights such as 1 lb. cans which may be used initially.

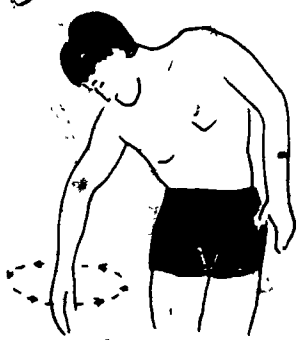
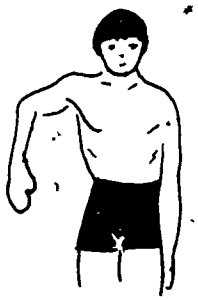


Fig. 2-7 Shoulder Circumduction

3 A common type of dislocation, subcoracoid, occurs when the arm is in an abducted, externally rotated position Therefore, exercises for adduction and internal rotation are often stressed



Adduction

Fig. 2-8 Shoulder Dislocation Exercise

Pulley exercises for shoulder problems.

1. Shoulder adduction and extension (pectoralis major), latissimus dorsi at arm's length with the affected shoulder toward the pulley weights Grasp the handle and pull across the chest and down to the opposite hip
2 Shoulder adduction with extension (pectorals, latissimus dorsi, teres major, posterior fibers of deltoid). From same position as 1, pull down and behind the back to opposite hip.

3. Horizontal abduction with extension (posterior fibers of deltoid, latissimus dorsi). Stand with the affected shoulder away from the pulley weights. Reach across the chest, grasp the handle, and pull across and down.
4. Shoulder extension (latissimus dorsi, teres major, posterior fibers of deltoid). Stand facing the pulley weight. Reach forward, grasp the handle at shoulder height, and pull down and behind the hip.
5. Shoulder adduction with extension (pectorals, latissimus dorsi, teres major, posterior fibers of deltoid). Stand with affected shoulder toward the pulley weights. Grasp the handle at shoulder height and pull down to the side.

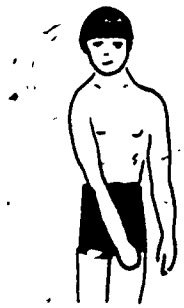


Fig. 2-9 Shoulder Adduction with Extension

Dumbbell exercises for shoulder problems.

1. Shoulder flexion to 90 degrees (deltoid, coracobrachialis). Starting with the arm at the side, flex the upper arm to shoulder height with the elbow fully extended.
2. Shoulder extension (latissimus dorsi, teres major, posterior fibers of deltoid). Starting with arm at side extend the arm through full R.O.M. (about 45 degrees).
3. Shoulder abduction in the horizontal plane (deltoid, infraspinatus). With the arm at the side, abduct the upper arm to about 90 degrees. Increase the range as the student's recovery progresses.
4. Shoulder circumduction (deltoid, supraspinatus). With the upper arm abducted to 80 to 90 degrees, circumduct the arm. Increase the size of the circles as the student's recovery progresses.
5. Internal and external rotation of the shoulder (subscapularis, pectorals, latissimus dorsi, teres major, infraspinatus, teres major). In the supine lying position, with the upper arm abducted to 90 degrees and the elbow flexed to 90 degrees, lower the dumbbell by external rotation; then raise the dumbbell to the starting position and lower it by internal rotation at the upper arm. *This exercise should be assigned when it is felt the shoulder is healing well.* When the exercise is introduced, guards should be required in front and back to limit the range of motion because excessive rotation might be contraindicated. (See Chapter IV, Exercises for the Shoulder.)
6. Elbow flexion (biceps, brachialis). With the entire arm supported on a table, perform one arm dumbbell curls. These exercises may be prescribed in sets of two, three and sometimes four, with then to fifteen repetitions to a set. Begin with light weights, both on the pulleys and with the dumbbells, and increase the amount as the student's recovery progresses. *Exercising regimen should not be prescribed until the medical inspector signs a clearance.* However, exercises should be prescribed for other than the injured area(s) to minimize general body atrophy. Two arm curls may be carried out using a barbell. (See Chapter IV, Exercises for the Elbow.)

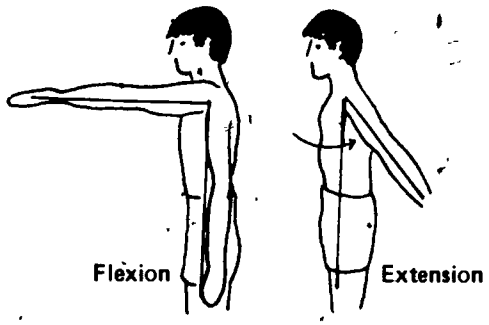


Fig. 2-10 Shoulder Positions

Adaptation of Games and Activities

Providing individualized games and activities for the handicapped necessitates consideration of each child's abilities and limitations so that modifications and adaptations can be made to insure safe participation. Doolittle recommends the following modifications in games and activities for the handicapped.[1]

General considerations

1. Many children who are permanently disabled have already developed adaptations which will allow them to participate in some physical activities. Permit these children to proceed at their own rate of involvement, then if they experience problems and cannot make the appropriate adjustments, suggest possible alternatives.
2. When working with a new child, begin slowly with activities which are familiar to him. Keep in mind that the child may have some fear of new experiences, may become embarrassed because of his inability, or may show little interest.
3. Adaptations should focus on the child's abilities rather than his disabilities.
4. Modification of game rules should not be discouraged and should reflect the needs and desires of the group playing the game.
5. Try not to change the game to such a degree that the children lose sight of what they intended to play. The game should resemble, as closely as possible, the game typical children play.

[1] John H. Doolittle, "Adaptation of Games and Activities." Penn State University.

Methods of modifying games and activities:

1. Reduce the range of the game:
   a. Decrease the boundaries of the court, field, or play area
   b. Lower the net or goal
   c. Increase the number of players designated to cover an area
   d. Play net-type games through a hoop
   e. Use soft, or lightweight, play implements that will not travel far when hit, kicked, or thrown
   f. Attach a cord (tether) to a ball to limit the distance it will travel
   g. Introduce changes to the rules that will reduce the amount of force applied to implements being used in the game
   h. Reduce the time periods of the game or the number of points required to complete the game.
2. Use equipment that can be handled easily:
   a. Light plastic implements that can be effectively held in one hand
   b. Large, partially inflated beachballs that can be handled with the arms and hands
   c. Soft yarnballs or fleece balls that can be grasped easily.
   d. Implements with special grips or handles
3. Reduce the speed of moving objects:
   a. Use large, lightweight balls that travel at a slower rate of speed
   b. Decrease the air pressure in the ball
   c. Introduce changes in the rules that will regulate the speed of the participants or the amount of force they may apply to the game implements:
      (1) Walk or hop, rather than run
      (2) Throw the ball underhand
      (3) Roll the ball
      (4) Punch or throw the ball rather than kick it
      (5) Throw the ball to several others on the team before throwing it to a base
   d. Play ball games on grassy surfaces
4. Use mechanical devices which will:
   a. Stabilize the participant; his limbs, or playing implements
      (1) Tripods or slings for riflery and archery
      (2) Braces or straps to aid in gripping
      (3) Terminal attachments to prosthetics for gripping, supporting, releasing, and activating
      (4) Ball bearing feeder for table games
   b. Increase the reach of the participant
      (1) Pusher for bowling
   c. Impart force or momentum to game implements
      (1) Crossbow for archery
      (2) Chute for bowling
   d. Align the participant with the boundaries, target or goal
      (1) Guide rail for bowling
      (2) Sound devices behind goals or at boundaries
      (3) Sound devices within balls
5. Provide additional rest periods:
   a. Allow free substitution in games
   b. Rotate players from active positions to less active positions
   c. Encourage time-out for rule interpretations or strategy discussions
   d. Provide quiet table games on the sidelines which are similar to the game being played on the field or court.
      (1) Nok hockey
      (2) Box soccer
      (3) Electric basketball, football, baseball
      (4) Darts – baseball
      (5) Skittles
      (6) Bowling

Modification of games and activities for exceptional children. As a rule, activities are selected from those which are most appropriate for various age groups and/or social levels of normal children. The difference lies in the application of these activities.

Adapting individual and dual sports

Archery: use lighter bow, arrows with rubber tips. Student may sit, draw targets.

Bait-fly casting: Place target boards on gym floor or field at various distances. Students may sit.

Badminton: four players on each side, each playing small zone. "Hoopbird" played with bird or yarnball.

Bowling: use plastic "gym-bowl" equipment or plastic detergent bottles. Student may bowl from a chair or sit on the floor. Roll ball through cardboard tube or box.

Croquet: Use plastic mallets and wiffleballs; vary the distance to the wickets.

Gymnastics: tumbling, parallel bars, high bar, rings, side horse.

Golf: Hit plastic practice ball into old tennis or volleyball nets which are faced with burlap. Putt on an old rug into a can placed on its side. Make miniature golf course from odds and ends.

Handball: One wall, use partially deflated volleyball or smaller playground ball to slow the action of the game.

Horseshoes: Rubber shoes or quoits can be used in and out of doors. Throw shoes into a box.

Shuffleboard: Shorten distance between scoring zones. Student may sit.

Swimming: Obtain American Red Cross *Swimming for the Handicapped.*[1]

Table tennis: Use larger paddles, make small table-size hoop and play as "hoopbird." Place plywood sides on the table so the ball will not bounce off the table as often; off the sides, ball remains in play.

Tetherball: Sit or stand, punch or kick. Make small table-size game with broomstick and small rubber ball in a silk stocking.

Quiet games: nok-hockey, table shuffleboard, pool, darts, beanbag toss games, box soccer

[1] American Red Cross *Swimming for the Handicapped*

Adapting team sports:

Baseball-softball-type games: Use light plastic bats and whiffleballs, batting tee. Use base runners, two sets of bases (one of shorter distances), throw the ball into the field rather than bat it. Give children positions that require little movement.

Kickball: Punch or throw the ball rather than kick it. Place ball on home plate rather than roll it.

Basketball type games: Limit movement in the game by playing 21, Around the World, Six Court, Half-Court, Scooter Basketball, Foul Shooting, Barrelball. Have student do the foul shooting for both teams.

Soccer-hockey-type games: Have student play goalie. Reduce size of goal. Scooter games: punching a playground ball. Hockey played with old brooms and volleyball. Barrelball: shooting for hole. Volleyball-type games: deck tennis, Newcomb, use larger soft bladder ball. Have both teams sit on the floor; put net at 4-5'.

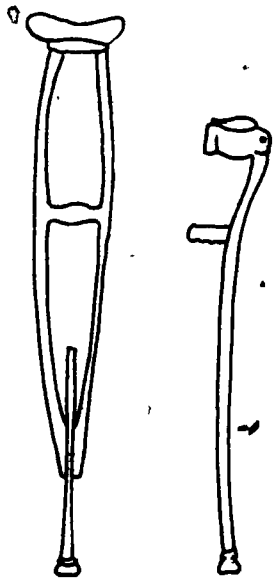
Cane and Crutch-Walking Procedures[1]

The cane is not a weight-bearing device but rather a supportive or balance aid, therefore, it should be held in the hand *opposite* the injured extremity. This technique establishes a good three-point base providing greater stability. For proper fitting, the cane should rest on the floor two to four inches laterally and forward at the foot (the elbow should be flexed to approximately 30 degrees). The end of the cane should be equipped with a suction-type rubber tip.

Common types of crutches.

Axillary – those which fit up under the arm (axilla)

Lofstrand – for those who do not require underarm support. A cuff fitting around the forearm and a hand-grip provides support.



Axillary Lofstrand

Fig. 2-11 Crutch Types

[1] John H. Doolittle, "Crutch and Cane Walking," Penn State University

Fitting axillary crutches. The length of the crutch should permit two fingers to be placed between the crutch pad and axilla. The handgrip should be adjusted to allow flexion of the elbow to about 30 degrees. The end of the crutch should be equipped with a good sized suction-type rubber crutch tip to provide good traction and shock absorption.

Prerequisites for crutch walking.

1. Ability to stand upright (with or without aids).
2. Ability to flex the shoulder (to bring the crutch forward).
3. Sufficient strength in elbow extensors (triceps) to bear weight.
4. Sufficient strength in shoulder extensors (latissimus dorsi) if swing through type gait is used.
5. Sufficient hand strength to grasp crutch handle.

Pre-crutch locomotion activities. Ambulation between parallel bars, or use of overhead support and crutches to perfect gait. (See Chapter IV, General Therapeutic Exercises, for appropriate strengthening exercises).

Types of crutch gaits.

Four-point – a nonweight-bearing gait used by people with extreme ambulation difficulties. One crutch moves forward followed by the opposite foot. Then the other crutch moves forward followed by the other foot. Right crutch, left foot; left crutch, right foot.

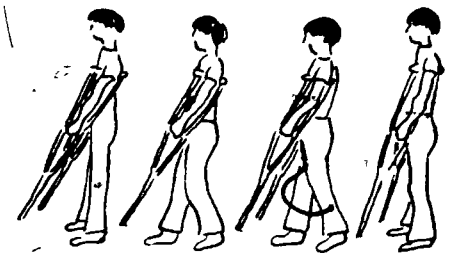


Figure 2-12 Four-point

Three-point – a very common gait used by people with a single leg involvement such as sprained ankle, broken leg, or amputation. The crutches are placed forward, taking all weight off the injured extremity. The unaffected leg swings through and forward. In time, the injured extremity may move forward with the crutches accepting partial weight.

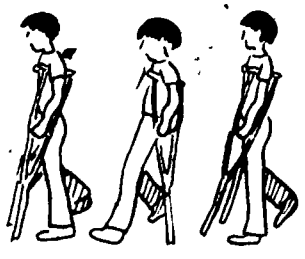


Fig. 2-13 Three-point

Two-point – often used when there is involvement of both legs and a compromise can be made between speed and stability. One crutch and the opposite foot are placed

forward at the same time, followed by the other crutch and foot. The cross-pattern of walking is employed.

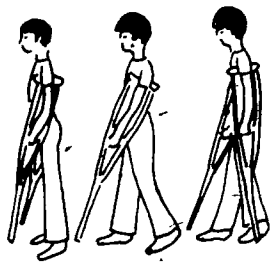


Fig. 2-14 Two-point

Drag-to – same procedure outlined in "swing-to" except that the subject moves both feet forward by a "dragging" action rather than the straightening of the elbows.

Drag-through – same procedure outlined in "swing-through" except that the subject moves both feet forward of the body by a "dragging" action rather than by straightening the elbows and "jack-knifing" the body.

Swing-to – used by people with extreme involvement of both legs and some involvement of the trunk so that the legs cannot be moved independently. The crutches are placed in front of the body, then the subject leans into the crutches and pushes the body off the floor by straightening the elbows. As soon as the heels touch the floor between the crutches, the shoulders are moved rearward to shift the body weight to the feet so that the crutches can be brought forward.

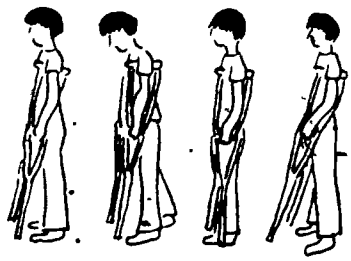


Fig. 2-15 Swing-to

Swing-through – used by people with extreme involvement of both legs and some involvement of the trunk so that the legs cannot be moved independently. The crutches are placed forward, then both legs swing through and forward by straightening the elbows and "jack-knifing" slightly, thus permitting the crutches to be moved forward once again. These people wear leg braces and have been taught how to accept their body weight. Some students (e.g., Cerebral palsied) may have to be taught individual crutch gaits necessitated by unique disability.

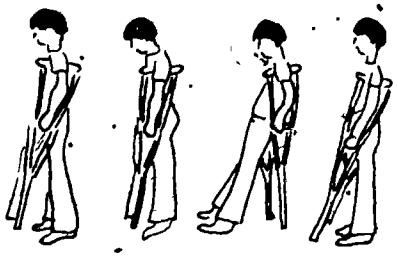


Fig. 2-16 Swing-through

Stair climbing

Ascending – place the unaffected foot on the tread of the step, then bring up the crutches and the injured extremity. When spotting, stand behind the student and hold his belt. If a handrail is involved, place both crutches under the arm farthest from the handrail and proceed as described above.

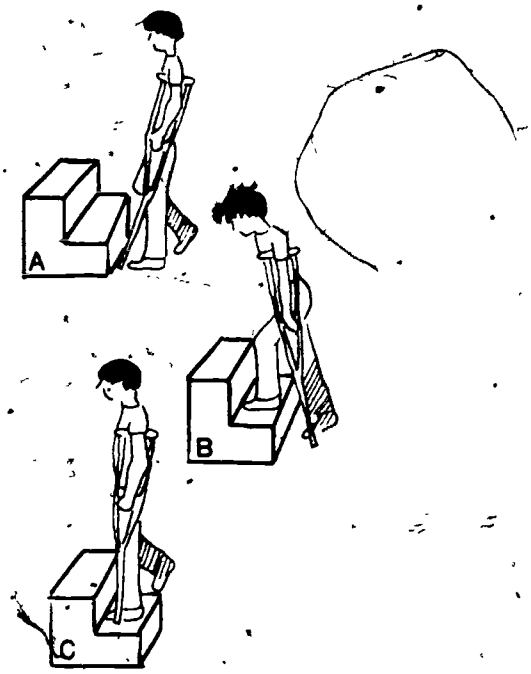


Fig. 2-17 Ascending Stairs

Descending stairs – place the crutches and the injured extremity on the lower tread of the step, then step down with the unaffected extremity. When spotting, stand in front of the student. Instruct the student to place his feet several inches from the riser of the step as this will provide more room for clearance, both ascending and descending

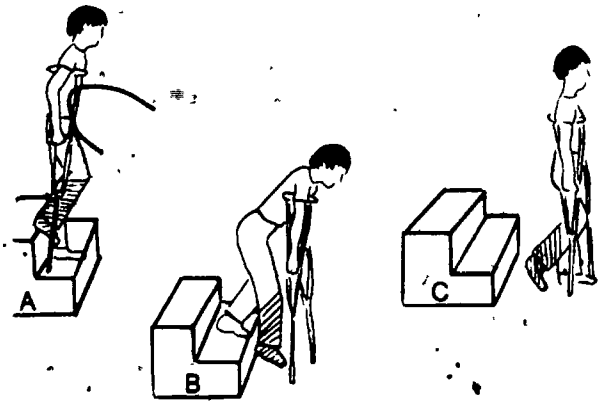


Fig. 2-18 Descending Stairs

EVAULATION PROCEDURES

Readminister all objective tests at nine-week intervals. Note progress based on review of objective and subjective data. Post-operative and convalescent students who have recouped their vitality (and all others who can function in a regular program) should be recommended for release from the program. Do not schedule those students in the unrestricted program, however, until you receive a medical confirmation. There may also be students who can function in the regular program but need additional individual assistance.

Students with permanent disabilities or limitations should be integrated in the unrestricted program whenever such an arrangement is *educationally sound*. Flexible scheduling probably affords the best opportunity to meet the needs of the child with a permanent handicap in that his D&A Program could be designed to provide those types of individualized activities that lead to optimal functional capacity within his limitations. It would, further, provide the teacher with time to assess the student's progress and to represcribe as indicated. On the other hand, integrating the handicapped child with his peer group will not only aid his adjustment socially and emotionally but will also serve as a sound educational experience for the non-handicapped in that they will recognize him as a human being who needs to be accepted as a functioning member of society.

Record student achievement on the Behavioral Performance Chart as follows: Physical fitness and motor ability tests pre- and post-test scores; muscle girth, SDI, range of motion – pre- and post-test scores; self-concept and attitude inventories – pre- and post-test scores; and criterion-referenced norms – pass or fail.

Pupil Progress Report to Parents

It is important that parents be made aware of the progress of their child in the D&A Program. Appendix E provides a suggested reporting format. The form provides a means of indicating the progress the child makes in terms of each test item and each developmental area. Provision is also made for parental comments and requests for a conference.

SUMMARY OF THE TAPE PROCESS

The sequence the teacher uses for individualizing instruction involves:

T Testing the student to gather baseline data.
A Assessing the individual performance of the student.
P Prescribing a sequentially developed program of individualized activities.
E Evaluating student progress at periodic intervals.

Fig. 2-9

(Teacher Training Program, University of Northern Iowa, Cedar Falls)

STUDENT AND TEACHER LEARNING EXPERIENCE

CHAPTER THREE

STUDENT AND TEACHER LEARNING EXPERIENCES

Learning can be greatly enhanced if the individual, whether student or teacher, becomes totally involved in the learning process. To achieve total involvement, the learner is provided with, a lecture, a demonstration, an opportunity to perform the specific task to be achieved, and feedback regarding performance. By incorporating all of these strategies, learning experiences are acquired. Accordingly, the following experiences are recommended not only for the teacher involved in the training program but also for the students participating in a school program.

LEARNING EXPERIENCES

Measure Muscle Girth, Strength Decrement Index and Range of Motion, Grades 9-12

Teacher's role.

a. Explain and demonstrate the correct technique of:
   (1) measuring muscle girth with a tape.
   (2) determining the Strength Decrement Index of a muscle using this formula:[1]

$$SDI = \frac{S_b - S_a}{S_b} \times 100$$

Symbols: SDI = Strength Decrement Index
S_b = Strength before exercise
S_a = Strength after exercise

   (3) determining range of motion using the range of motion assessment chart. (Refer to assessment chart in Chapter II.)

b. Explain the effects of exercise on muscular development and flexibility.

c. Distribute the necessary testing equipment and assist the students in testing.

[1] H. Harrison Clarke et al., "Strength Decrement Index", p. 376

Student's role.

a. Pair and work with a partner measuring muscular girth of the normal and disuse-atrophied limb, Strength Decrement Index (one's tolerance limits), and range of motion.

b. Check with the instructor to insure the use of the proper testing technique.

c. Record his scores on his prescription card.

Measure Performance of Skills Necessary for the Daily Pursuits of Life (Wheelchair, Crutch-and Cane-walkers, Grades 1-12.)

Teacher's role.

a. Observe and evaluate the ability of the student in a wheelchair to:
   (1) get in and out of wheelchair
   from crutches — 1 minute
   from bed — 1 minute
   from chair — 1 minute
   from toilet — 1 minute
   from automobile — 1 minute
   (2) perform the following tasks:
   open and close door — 1 minute
   open and close desk drawer — 20 seconds
   propel wheelchair — move chair forward, backward, turn right and left

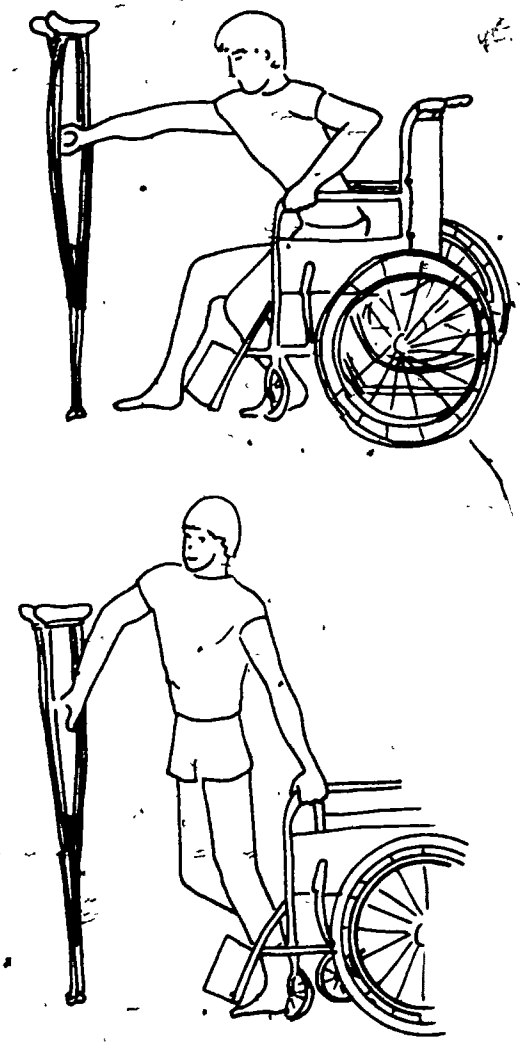


Fig. 3-1 Transferring from Wheelchair to Crutches

(3) transfer to crutches or cane(s) and locomote Indoors, minimum of 20 feet, within a time considered practical by the teacher. Student should be tested on various surfaces. e.g. carpet, wood, tile. Outdoors, for practical ambulation, the student should be able to traverse 150-200 feet, and walk 48 feet in 20 seconds, the distance and time necessary to cross a street. Student should also be able to ascend and descend stairs with one handrail and crutches, ascend and descend ramps, and ascend and descend curbs.

Student's role.

a Perform the tasks as required by the teacher, grades 1-8.

b. Perform the tasks as required by the teacher, grades 9-12.

In addition, evaluate personal performance in terms of skills that need to be improved. Discuss his personal appraisal with the teacher.

Develop an Individualized Prescription, Grades 1-12

Teacher's role.

a. Supervise a prescriptive program, furnished by the family or school physician, to ameliorate or eliminate the motor disabilities and limitations of students in grades 1-8 (based on testing and observation).

b. Assist the students in grades 9-12 in the development of their prescriptions.

Student's role.

a. Develop his own prescription, grades 9-12. His prescription must be approved by the instructor and must *be consistent with the recommendation of the medical inspector.*

Participate in Games and Leisure Time Activities, Grades 1-12

Teacher's role.

a. Provide a variety of games and leisure time activities modified to meet the handicapping conditions manifested by the students. (Adams, Daniel and Rullman provide an excellent list of games and activities in their text.)[1]

b. Structure the teaching and learning situation so that the games can be implemented.

c. Provide the necessary supplies and equipment.

d. Prepare a checklist to identify student interests and participation in games and leisure time activities.

e Adapt activities to focus on abilities rather than disabilities.

f. Establish an intramural program for the handicapped.

Student's role.

a. Select and participate in the games and leisure time activities of his choice during the school day, after school, and at home.

b. Select and participate in two *new* games and leisure time activities of his choice.

APPLICATION OF THE TAPE PROCESS

Hypothetical Case Study #1 Student suffered a fracture of the right femur. Fracture was of such a nature that it required open reduction with internal fixation of metal plate and screws. Student is slightly overweight and not in good physical condition. In the hospital for approximately two weeks. Received physical therapy the last two or three days in the hospital. Parents did not want student to miss additional school time; student fair in academic studies.

[1] Ronald C Adams, Alfred N. Daniel, and Lee Rullman, *Sports and Exercises for the Physically Handicapped*

Student arrives in wheel chair, casted from foot to just below hip. Student is scheduled for D&A program.

The instructor reviews a brief note from the student's physician requesting student be instructed in crutch ambulation, including stairs and other activities that would increase his strength and endurance. The instructor sees the student in a wheelchair. Discusses the problem with the student. Tries to obtain information, such as:

(Township of Ocean School District, Oakhurst, N.J.)

Fig. 3-2 Establishing Teacher-Pupil Rapport
(Teacher Training Program
University of Northern Iowa, Cedar Falls)

1. How the student suffered the fracture.
2. Period of hospitalization.
3. Physical therapy program while in hospital.
4. Physician's orders or requests, when leaving hospital.
5. Next appointment with the physician.
6. Address of physician.
7. How does student get around his home.
8. Home all on one floor or two.
9. Number of steps or stairs to climb at home, school, church, etc.
10. Is student active in school, community, church, etc.
11. Physical education teacher's name(s).
12. Classroom teacher's name(s).
13. Names of other teachers or specialists seeing child.
14. Student's hobbies or activities.

After making notes on the above information, teacher should evaluate the student. The evaluation process should include:

1. Muscle girth
2. Strength Decrement Index (SDI)
3. Range of motion
4. Physical fitness and motor ability test (difficult with this student because of cast.)
5. Wheelchair performance activities
6. Crutch-walking procedure
7. Self-concept assessment.

Make careful notations on the appropriate forms or on anecdotal remarks sh[illegible].

Review all evaluation procedures for strengths and weaknesses of student. Start to form[illegible]te the exercises and activities needed to increase strength, coordination, endurance, range of motion and self-con[illegible]. In addition, contact physician, if necessary, phys[illegible]therapist, teachers and others, to obtain a complete pic[illegible]re of the student.

Begin exercises in increase strength of upper extremities for crutch-walking, and of uninvolved leg, preferably resistive exercises to increase strength for crutch-walking. General exercise program to increase general conditioning of student. (See Therapeutic Exercises Section in Chapter IV for general exercise program.)

Begin activities of interest to student that can be accomplished from wheelchair, such as modified table tennis, shuffleboard, table tether ball, and other table top games.

Begin crutch activities by standing student against wall. Measure crutches for proper fit. Begin with standing balance; progress to three-point gait.

Continue exercise programs to increase strength. Vary activities and work on specific activities interesting to the child.

If student does well on crutches, continue with stairs, ascending and descending, to make student independent of wheelchair.

Continue with exercise and activities until cast is removed. Obtain written information from physician for exercises involving the lower extremity. Follow physi-

cian's request This request may consist of exercises for the foot, ankle, knee and hip. Start gently and gradually Strength and range of motion are important. Find out from physician when the student can begin to bear some weight on involved leg.

Do not stop exercises for upper extremities and uninvolved leg Continue activities and skills.

Review and continue to reevaluate, using all evaluation procedures as previously outlined

Continue crutches with or without weight bearing until physician puts student on cane.

Measure cane, check proper gait, and performance on stairs Continue exercise programs and general conditioning exercises for all four extremities and body activities.

Continue cane and exercises until physician feels student can ambulate without cane, then begin more exercises and general activities so that he may return to the regular physical education program

The hypothetical case could run from 4-6 weeks to 3 or 4 months, depending on the healing time and possible complications Guided by the physician's decisions, activities and exercises should be continually revaluated in light of the needs of student

Hypothetical Case Study #2 Cerebral Palsy is motor dysfunction caused by a brain lesion In many instances therefore, the orthopedic disability is only part of the problem There may be intellectual deficiencies, perceptual deviations, visual and auditory problems in addition to the motor dysfunction

Spastic Cerebral Palsy, particularly spasticity of the lower extremities, is most common Although each case is unique there are generalities. A "typical" case is this:

Johnny is a 15 year old spastic Cerebral Palsy, primarily in the lower extremities (spastic paraplegia). He is able to ambulate with the aid of Canadian crutches (aluminum crutch canes with support at mid forearm), but progresses very slowly and laboriously at great energy cost There is mild spasticity of trunk and upper extremities, but arms and hands function well except for very finite motor skills. Intellect is low normal, and with minor adaptations in school environment Johnny is able to attend regular classes

Questions to ask.

Johnny does ambulate Can this be improved? Is there deformity that can be corrected? (He is now 15 years old) Can we speed up the slow gait? Is there full ROM? If not, can we increase ROM? Is there muscle weakness? Can we strenghthen muscles if weakness exists?

If the answers to these questions are "no" then gait pattern should not be changed and emphasis should be placed on adapted activities and recreation In what games will he be able to participate if they are adapted to his abilities? And what recreative activities will give him enjoyment and exercise? It should be understood that not all disabilities can be remediated If this is so, then the individual should be as efficient as possible within the parameters of his disability

Fig. 3-3. Individualized Weight Training Program
(Morris Hills High School, Rockaway, N J)

RESOURCE TASKS AND ACTIVITIES

CHAPTER FOUR

RESOURCE TASKS AND ACTIVITIES

This resource chapter is designed to assist the teacher in providing exercises directed to all parts of the body. The tasks and activities described herein are intended only as a guide, to be modified and adapted as necessary.[1]

The therapeutic exercises are divided into the following classifications:

1. Passive exercises: Tasks that cannot be accomplished by the patient but must be done entirely by the instructor or the therapist.
2. Active assistive exercises: Activities that are accomplished in part by the patient with the assistance of the instructor or therapist.
3. Active exercises: Exercises that are accomplished by the patient against gravity with some additional form of resistance such as weights, springs, or manual resistance.

The individual under treatment may be able to accomplish resistive exercises for some parts of his body, but for other parts may need assistance in performing passive exercises. It is important to evaluate each patient and to plan a firm, sound exercise program based on his own needs and abilities.

It is also important to keep accurate records on the status of the patient in a therapeutic exercise program. This information should include the amount and type of exercise, the number of repetitions, times per day, resistance (if any), and the condition of the patient after completing a specific routine.

The exercises on the following pages are active exercises, with the exception of certain resistive exercises.[1] These are not the only exercises to be used for a particular disability. All four classifications of exercises can be appropriately used, depending on the condition of the patient and his medical treatment.

The therapist or instructor must remember to treat the whole individual and not just the joint or area involved. For example, if the patient has a condition affecting the knee, exercises must include hip and ankle on the affected side, as well as general conditioning exercises for the entire body.

Exercises For The Upper Back

1. a. prone position
   b. arms at sides
   c. elbows straight
   d. palms of hands upward
   e. pull scapulae together
   f. shoulders do not move
   g. hold
   h. return to starting position
2. a. prone position
   b. arms at sides
   c. elbows straight
   d. palms of hands upward
   e. raise arms to 45 degree angle
   f. shoulders do not move
   g. hold
   h. return to starting position
3. a. prone position
   b. place hands in the small of the back
   c. palms of hands upward

[1] The supply and equipment needs necessary to effectively implement a program for individuals with motor disabilities and limitations are provided in Appendix F.

[1] Ronald C. Adams, Alfred N. Daniel, and Lee Rullman. *Games, Sports and Exercises for the Physically Handicapped*, pp. 218-234. Permission to publish granted.

d. raise elbows and shoulders
e. head does not move
f. hold
g. return to starting position

4. a. prone position
b. arms at sides
c. elbows straight
d. raise head, shoulders, and chest
e. hold
f. return to starting position

5. a. prone position
b. arms at shoulder level, right angle to body
c. elbows straight
d. palms of hands facing downward
e. raise arms
f. hold
g. return to starting position

6. a. prone position
b. arms at 120 degree angle to body
c. elbows straight
d. palms of hands facing downward
e. raise arms
f. hold
g. return to starting position

7. a. prone position
b. forehead resting on table, mat, or support
c. arms extended overhead
d. elbows straight
e. palms of hands facing downward
f. raise arms
g. hold
h. return to starting position

Exercises For The Lower Back

1. a. supine position
b. knees flexed, feet flat on floor
c. roll pelvis backward
d. try to force lower back flat against floor
e. contract abdominal muscles
f. hold
g. return to starting position

2. a. supine position
b. knees bent, feet flat on floor
c. roll pelvis backward
d. try to force lower back against floor
e. contract abdominal muscles
f. slide one leg down until it is out straight on floor
g. lift leg, keeping it straight, upward to 90 degree if possible
h. bend knee toward 90 degree straighten knee, and lower leg back to floor
i. slide leg upward until knee is bent and foot flat on floor
j. repeat exercise on opposite leg
k. remember to keep pelvis tilted backward

3. a. supine position
b. legs out straight
c. bend one knee to 90 degree
d. grasp with hands, pull knee to chest
e. hold
f. return to starting position
g. repeat on other leg

4. a. supine position
b. legs out straight
c. bend both knees to 90 degree
d. grasp with hands, pull knees to chest
e. hold
f. return to starting position

5. a. stand with back against wall
b. heels 4 inches from wall
c. head, shoulders, and hips are against wall
d. roll pelvis upward, pull in abdomen
e. try to force lower back against the wall
f. hold
g. return to starting position

Exercises For Abdominal Muscles

1. a. supine position
b. knees flexed, feet flat on floor
c. arms extended overhead
d. slowly raise arms forward toward knees
e. with chin to chest, raise the upper body approximately 45 degrees
f. hold
g. lower slowly
h. return to starting position

2. a. supine position
b. knees flexed, feet flat on floor
c. arms folded across chest
d. contract abdominal muscle
e. slowly raise the upper body to a semi-sitting position
f. hold at approximately a 45 degree angle
g. lower slowly
h. return to starting position
i. repeat exercise with 3 to 5 lb. weight on chest

3. a. supine position
b. knees flexed, feet flat on floor
c. hands clasped behind head
d. elbows back
e. contract abdominal muscles

f. slowly raise the upper body to a semi-sitting position
g. hold at approximately a 45 degree angle
h. lower slowly
i. return to starting position

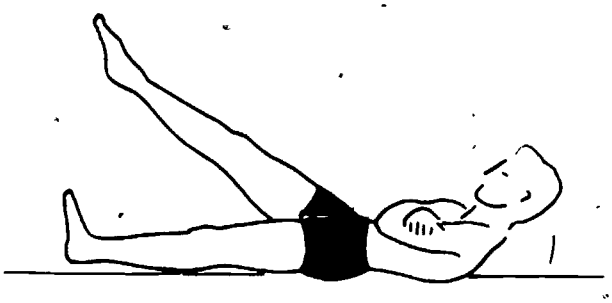
4. a. supine position
b. knees flexed, feet flat under bottom rung of stall bars or have therapist hold feet flat
c. hands clasped behind head
d. elbows back
e. slowly raise head and shoulders until they are 6 inches off floor
f. hold
g. lower slowly
h. return to starting position

5. a. supine position
b. knees flexed, feet flat under bottom rung of stall bars or have therapist hold feet flat
c. hands clasped behind head
d. elbows back
e. slowly raise head and shoulders off floor
f. rotate upper part of body to left while rising
g. hold
h. derotate
i. lower slowly
j. return to starting position
k. repeat exercise rotating to right

Exercises For The Hip

1. a. supine position
b. legs extended, knees straight
c slowly raise left leg as high as possible
d. hold
e. lower slowly
f. return to starting position
g. repeat with right leg
h. repeat with both legs at the same time

2. a. supine position
b. legs extended, knees straight
c. slowly raise left leg
d. slowly flex left knee to approximately a 90 degree angle
e. straighten knee slowly
f. lower slowly
g. return to starting position



h. repeat with right leg

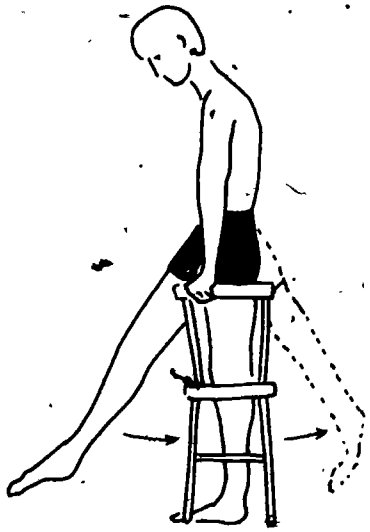
3. a. supine position
b. legs extended, knees straight
c. slowly raise left leg
d. bend knee and bring to chest
e. straighten left leg slowly
f. lower slowly
g. return to starting position
h. repeat with right leg

4. a. supine position
b. legs extended, knees straight
c. move (abduct) left leg slowly as far as possible
d. toes pointed toward ceiling, knees straight
e. hold (abducted)
f. slowly return to starting position
g. repeat with right leg.
h. repeat with both legs simultaneously

5. a. supine position
b. legs extended, knees straight
c. contract gluteal (buttocks) muscles
d. hold
e. relax

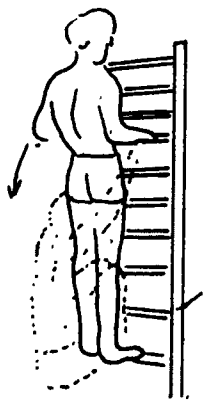
6. a. lie on left side
b. flex knee of left leg slightly
c. keep knee of right leg straight
d. raise (abduct) right leg as far as possible
e. hold
f. return slowly to starting position
g. repeat exercise on other side

7. a. stand between two chairs, hands on backs of chairs for support
b. elevate one foot slightly off floor
c. full weight on other leg, keep knee straight
d. swing leg with pendulum motion
e. return to starting position
f. repeat exercise with other leg



Exercises For The Knee

1. a. supine position
   b. legs extended
   c. place small rolled towel under one knee
   d. tighten thigh musculature and raise heel
   e. push back of knee against towel
   f. hold for count of five
   g. return to starting position
2. a. supine position
   b. legs extended
   c. tighten thigh musculature
   d. lift one leg 6 inches, keep knee straight
   e. hold
   f. lower slowly
   g. return to starting position
3. a. supine position
   b. legs extended
   c. tighten thigh musculature
   d. lift one leg, keep knee straight
   e. try to lift leg to right angle with table
   f. flex knee to maximum
   g. lower leg to starting position
4. a. sit on edge of table
   b. posterior thigh supported
   c. slowly flex knee
   d. flex knee to maximum
   e. extend knee
   f. repeat
5. a. stand facing stall bars
   b. place both feet on lower rungs
   c. spread feet about 12 inches apart
   d. hold onto stall bars with hands at shoulder height
   e. slowly lower body for knee flex
   f. slowly raise body for knee extension



6. a. ride a stationary bicycle
7. a. sit on table
   b. body erect, hands grasp front of table
   c. small rolled towel under uninvolved knee
   d. small stool supporting involved leg when knee is flexed to 90 degree or maximum
   e. fasten foot boot, or other weight device, securely on uninvolved leg
   f. determine maximum amount of weight that can be lifted with uninvolved knee; this is to be used as a guide for the involved knee
   g. knee must come to full extension
   h. must complete 10 repetitions of heaviest weight
   i. weight must be lifted through extension of the knee
8. a. sit on table
   b. body erect, hands grasp front of table
   c. small rolled towel under knee
   d. small stool supporting foot when knee is flexed to 90 degree or maximum
   e. fasten foot boot, or other weight device, securely on foot
   f. attach light weight (1½ to 2½ lbs.)
   g. extend knee, hold for count of 3 and then lower; repeat 10 times
   h. continue to add weights; extend knee, hold for count of 3, and then lower; repeat 10 times with full extension, if possible, of knee until patient reaches maximum without pain
   i. next treatment session: take 50% of heaviest weight lifted: (example 50% of 10 lbs = 5 lbs)
   j. start with 5 lbs; proceed as outlined in g
   k. next step is to lift 75% of the maximum load on involved side (example: 7½ lbs x 10 repetitions)
   l. final step is 100% (10 lbs x 10 repetitions)
9. a. sit on table
   b. body erect, hands grasp front of table
   c. small rolled towel under involved knee
   d. knee flexed 10 to 20 degrees, foot resting on stool
   e. attach foot boot with 50% of maximum weight (Exercise #8)
   f. extend knee to lift weight through this short range of motion (to increase strength of vastus medialis for full extension)
   g. hold at full extension to count of 5; repeat 10 times
   h. continue with weighted boot, hold knee in full extension for longer periods first 5 seconds then 10 seconds

Exercises For The Ankle And Foot

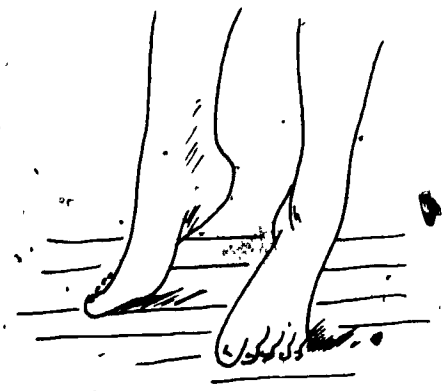
1. a. sitting, prone, or supine position
   b. foot in neutral position
   c. dorsiflex (pull up) foot as far as possible
   d. hold
   e. plantar flex (push down) foot as far as possible
   f. hold
   g. return to starting position
2. a. sitting, prone, or supine position
   b. foot in neutral position
   c. dorsiflex foot and invert (pull medially) as far as possible
   d. hold
   e. do not rotate hip or upper leg
   f. return to starting position

3. a. sitting, prone, or supine position
   b. foot in neutral position
   c. plantar flex foot and invert (pull medially) as far as possible
   d. hold
   e. do not rotate hip or upper leg
   f. return to starting position

4. a. sitting, prone, or supine position
   b. foot in neutral position
   c. plantar flex foot and evert (pull laterally) as far as possible
   d. hold
   e. do not rotate hip or upper leg
   f. return to starting position

5. a. sitting or supine position
   b. foot in neutral position
   c. instructor or therapist takes patient's heel in palm of hand
   d. instructor or therapist's fingers are across heel near insertion of "Achilles tendon"
   e. upper part of instructor or therapist's hand, wrist, and forearm is placed against sole of foot
   f. opposite hand is placed on anterior surface of knee to keep knee straight
   g. instructor or therapist slowly pushes toes, foot, and ankle into dorsiflexion by moving hand and forearm toward the knee
   h. hold at maximum stretch
   i. release slowly
   j. return to starting position

6. a. stand
   b. feet parallel, 4 to 6 inches apart
   c. knees slightly flexed
   d. raise heel from floor into plantar flexion
   e. hold
   f. lower slowly
   g. return to starting position



7. a. stand, facing wall about arm's length away
   b. feet parallel, 6 to 12 inches apart
   c. place toes and upper part of foot on book or piece of wood
   d. heel of foot on floor
   e. knees straight
   f. hands against wall
   g. keep body erect, buttocks in line with upper body
   h. slowly lean forward toward wall
   i. hold at maximum stretch
   j. return to starting position slowly

Exercises For The Fingers

1. a. sit at table
   b. palm flat on table
   c. spread fingers apart
   d. raise (extend) fingers from table one by one
   e. return to starting position

2. a. sit at table
   b. back (dorsal surface) of hand on table
   c. fingers extended
   d. flex fingers one by one at metacarpophalangeal joints
   e. keep interphalangeal joints extended
   f. hold
   g. return to starting position

3. a. sit at table
   b. back (dorsal surface) of hand on table
   c. fingers extended
   d. flex distal and then middle interphalangeal joints
   e. do not flex metacarpophalangeal joints.
   f. hold
   g. return to starting position

4. a. sit at table
   b. palm (volar surface) of hand on table
   c. fingers extended
   d. slowly spread (abduct) fingers as far as possible
   e. hold
   f. slowly bring fingers together (abduct) and squeeze
   g. hold
   h. do not lift fingers from table
   i. relax
   j. return to starting position

5. a. sit on table
   b. palm (volar surface) of hand on table
   c. flex fingers slightly
   d. slowly extend proximal phalanges
   e. keep fingers slightly flexed
   f. hold
   g. return to starting position

6. a. sit at table
   b. palm (volar surface) of hand on table
   c. extend thumb as far as possible
   d. hold
   e. return to starting position

7. a. sit at table
   b. palm (volar surface) of hand on table
   c. extend fingers and thumb
   d. keeping fingers and thumb extended

e. bring fifth finger and thumb together
f. touch tip of fifth finger and tip of thumb together
g. hold
h. return to starting position

Exercises For The Wrist

1. a. sit
   b. hand in relaxed position
   c. make a fist (flex fingers and thumb as tight as possible)
   d. hold
   e. extend and spread (abduct) fingers and thumb as far as possible
   f hold
   g. return to starting position

2. a. sit at table
   b. forearm resting on table
   c. hand midway between supination and pronation
   d. flex wrist and raise (elevate) side of hand off table
   e. hold
   f. return to starting position
3. a. sit at table
   b. forearm resting on table
   c. full supination of hand
   d. slide wrist toward fifth finger
   e. keep hand flat on table
   f. hold
   g. return to starting position
4. a. sit at table
   b. forearm resting on table
   c. flex wrist as far as possible
   d. hold
   e. return to starting position
5. a. stand facing a table
   b. hand palm down, forearm and elbow resting on table
   c. back (dorsal surface) of other hand on table
   d. slowly raise elbow and forearm upward from table
   e. hold
   f. return slowly to starting position
6. a. grasp door knob
   b. turn right
   c. hold
   d. turn left
   e. hold
   f. return to starting position

Exercises For The Elbow

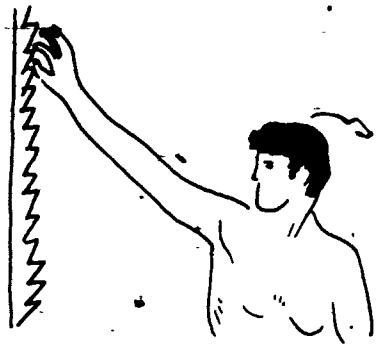
1. a. sit or stand
   b. arm at side, forearm supinated
   c. elbow extended
   d. flex elbow
   e. bring fingertips to shoulder
   f. hold
   g. extend elbow to maximum
   h. hold
   i. return to starting position
2. a. sit or stand
   b. forearm pronated
   c. elbow flexed to 90 degree angle resting on table
   d. slowly turn forearm and hand until palm is up (supination)
   e. hold
   f. slowly return to starting position
3. a. stand facing a bar at shoulder height
   b. grasp bar
   c. try to flex elbow (isometric)
   d. hold
   e. try to extend elbow (isometric)
   f. hold
   g. return to starting position
4. a. sit at table
   b. forearm resting on table
   c. grasp 12 to 18 inch rod or pole at one end
   d. slowly pronate as far as possible
   e. hold
   f slowly supinate as far as possible
   g. hold
   h. return to starting position
5. a. sit facing mirror
   b. wand resting on thighs
   c. grasp wand with both hands
   d. raise (flex) arms to shoulder level
   e. hold
   f. flex elbows, bring wand to nose
   g. hold
   h. extend elbows
   i. hold
   j. return to starting position

Exercises For The Shoulder

1. a. stand alongside table or chair
   b bend over at the waist
   c. uninvolved hand on table or chair for support
   d. arm on involved side hangs loose
   e. slowly swing arm forward and backward (pendulum action)
   f stop swinging, slowly
   g. slowly swing arm across body and then back (pendulum action)

h. stop slowly
i. slowly make circles left and then right
j. stop swinging, slowly
k. return to starting position

2. a. stand facing the wall
b. arm at side
c. place fingers on wall at hip level
d. (with elbow straight) slowly move fingers up wall
e. flex shoulder as far as possible
f. hold
g. return to starting position slowly



3. a. sit facing mirror
b. wand resting on thighs
c. grasp wand with both hands shoulder width
d keep elbows straight
e. slowly flex shoulders
f. bring wand up over head
g. do not arch back
h. hold
i. return slowly to starting position
j. do exercise without wand

4 a. sit facing mirror
b. arm at side, elbow straight
c. slowly raise (abduct) arm as far as possible to the side
d. keep palm down
e. do not lean in opposite direction
f. hold at maximum
g. lower slowly to starting position

5. a. sit facing mirror
b. arm at side
c. slowly raise (flex) arm as high as possible toward the front
d. palm down
e. hold
f. do not lean backward
g. lower slowly to starting position

6. a. sit facing mirror
b. wand resting on thighs
c. grasp wand with both hands shoulder width
d. keep elbows straight
e. raise wand toward mirror to shoulder level
f. hold
g. pull wand toward mirror to shoulder level
h. hold, return to front
i. pull wand to right as far as possible
j. hold, return to front
k. lower slowly to starting position
l. do exercise without wand

7. a. sit on stool
b. pulley with rope through it attached overhead on door, ceiling or extension of metal
c. elbows straight, shoulders flexed
d. body erect
e. grasp one end of rope with each hand
f. pull rope down into extension
g. opposite will go into flexion
h. hold at maximum pull
i. pull from flexion into extension
j. hold at full extension
k. repeat, alternating from flexion to extension
l. return to starting position

8. a. sit on stool
b. use pulley as in 7(b) above
c. shoulders abducted to 90 degree angle, elbows straight
d. grasp ends of rope one end in each hand
e. pull one arm down in shoulder adduction
f. other arm will go into shoulder abduction
g. hold in full abduction
h. reverse procedure, pull arm that is abducted into adduction
i. hold
j. repeat
k. return to starting position

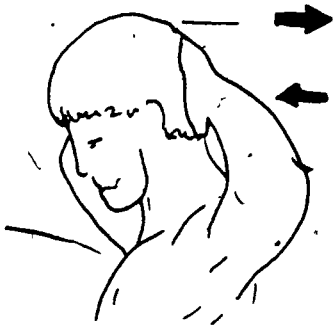
Exercises For Head And Neck

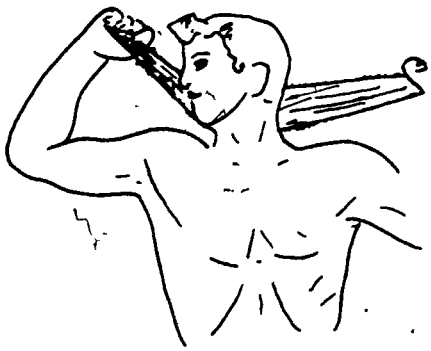
1. a. sit facing mirror
b. body erect
c. pull chin down and slightly back but not down on chest
d. slowly rotate head to right
e. hold
f. back to midpoint
g. slowly rotate head to left
h. hold
i. back to midpoint
j. return to starting position

2. a. sit facing mirror
b. body erect
c. pull chin down and slightly back but not down on chest
d. slowly tilt head toward right shoulder
e. hold
f. do not rotate head or raise (elevate) shoulder
g. return to midpoint

h. repeat on left side
i. hold
j. return to midpoint
k. return to starting position

3. a. sit on bench facing stall bars or wall
   b. arms flexed to shoulder level, elbows straight
   c. chin tucked in
   d. instructor or therapist places hand behind patients head
   e. patient presses head backward
   f. instructor or therapist gives resistance
   g. hold
   h. relax
   i. return to starting position





Exercises For Deep Breathing

1. a. supine position
   b. hips and knees flexed
   c. feet flat on floor
   d. inhale through nose to maximum
   e. hold briefly
   f. exhale through mouth with hissing sound
   g. repeat

2. a. supine position
   b. hips and knees flexed
   c. feet flat on floor
   d. place one hand on upper chest
   e. place other hand on abdomen
   f. inhale through nose and try to elevate the chest only
   g. hold briefly
   h. exhale through mouth with hissing sound
   i. abdomen should remain fairly still during exercise
   j. repeat

3. a. supine position
   b. hips and knees flexed
   c. feet flat on floor
   d. place one hand on each side of ribs
   e. inhale through nose, try to elevate chest only
   f. hold briefly
   g. exhale through mouth with hissing sound
   h. push hands together during expiration
   i. abdomen should remain fairly still during exercise
   j. repeat

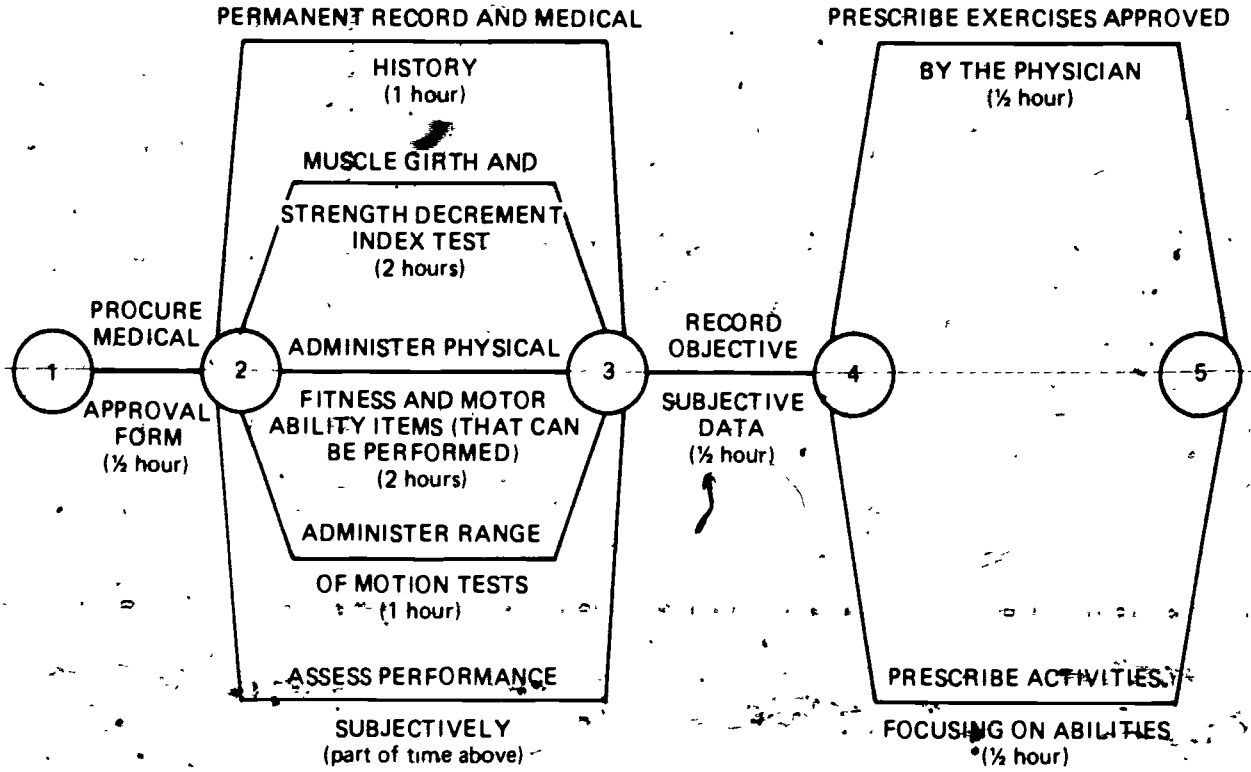
4. a. supine position
   b. hips and knees flexed
   c. feet flat on floor
   d. place folded towel around chest
   e. cross arms across chest
   f. grasp end of towel
   g. inhale through nose, try to elevate chest only
   h. hold briefly
   i. exhale through mouth with hissing sound
   j. pull towel tight during expiration
   k. repeat

5. a. sit in chair
   b. arms relaxed at sides
   c. slowly flex at waist
   d. exhale through mouth, as you flex body toward floor
   e. hold briefly at maximum position
   f. slowly sit up
   g. inhale through nose
   h. hold at sitting position
   i. repeat

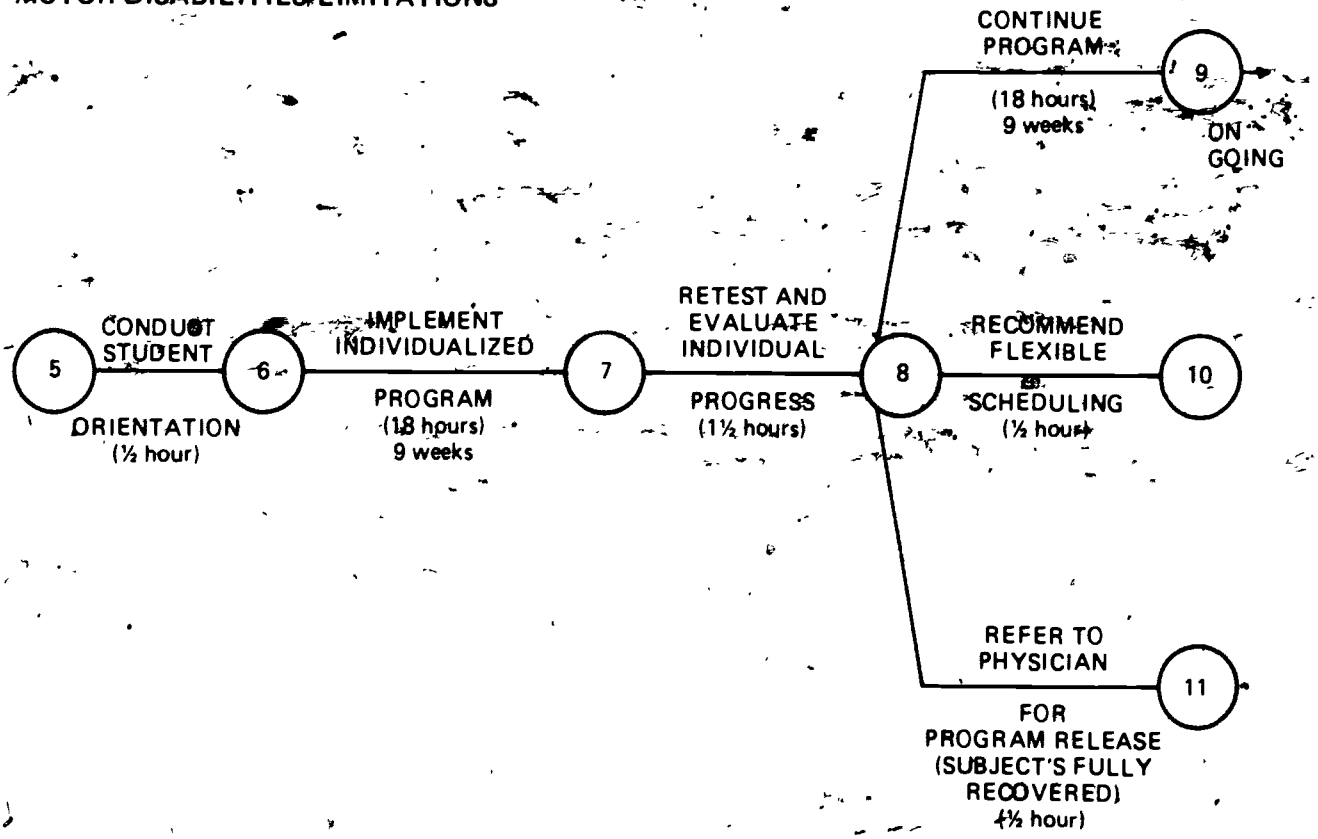
APPENDICES

APPENDIX A

NETWORK 17
MOTOR DISABILITIES/LIMITATIONS



NETWORK 18
MOTOR DISABILITIES/LIMITATIONS



APPENDIX A (Continued)

ACTIVITY CHECKLIST

MOTOR DISABILITIES AND LIMITATIONS

EVENT NUMBERS		ACTIVITY TIME	ACTIVITY DESCRIPTION	NETWORK NUMBERS	EXPLANATION
BEGINNING	ENDING				
1	5		IMPLEMENT PROGRAM FOR STUDENTS WITH MOTOR DISABILITIES OR LIMITATIONS	17-18	Self-explanatory
1	2	¼ hour	Procure Medical Approval Form Note: Medical forms are to be filed in the nurse's office, a copy of the form is to be placed in the child's folder	17	Self-explanatory
2	3	1 hour	Review Permanent Record and Medical History · Record pertinent data in teacher's register · Discuss the child's problem(s) with the Child Study Team	17	The D&A teacher will review the permanent record and medical history of every student in the program
2	3	2 hours	Administer Muscle Girth and Strength Decrement Index Tests (SDI) · Pair students for testing · Take muscle girth measurements with muscles contracted	17	Students will identify their "tolerance" limits

APPENDIX A (Continued)
ACTIVITY CHECKLIST
MOTOR DISABILITIES AND LIMITATIONS

EVENT NUMBERS		ACTIVITY TIME	ACTIVITY DESCRIPTION	NETWORK NUMBERS	EXPLANATION
BEGINNING	ENDING				
			· Administer strength test at the beginning and end of testing period (with exercise regimen between)		
2	3	2 hours	Administer Physical Fitness and Motor Ability Items · Keep a record of pre- and post-test progress	17	Students will be encouraged to perform those tasks that are within their ability levels
2	3	1 hour	Administer Range of Motion Tests · Use goniometer or flexometer to determine range of motion of joints	17	· Self-explanatory
2	3	part of time above	Assess Performance Subjectively · Keep record of anecdotal remarks that will assist in final evaluation	17	Self-explanatory
3	4	½ hour	Record Objective and Subjective Data	17	· Self-explanatory

APPENDIX A (Continued)
ACTIVITY CHECKLIST
MOTOR DISABILITIES AND LIMITATIONS

EVENT NUMBERS		ACTIVITY TIME	ACTIVITY DESCRIPTION	NETWORK NUMBERS	EXPLANATION
BEGINNING	ENDING				
4	5	½ hour	Prescribed Exercises Approved by the Physician ·Provide test data and suggested exercises for the physician's consideration	17	The family or school physician *will prescribe* all exercises
4	5	½ hour	Prescribed Activities focusing on Abilities ·Administer student interest inventory ·Post a list of modified games and activities that have been approved by the physician	17	The family or school physician *will prescribe* all games and activities
5	6	½ hour	Conduct Student Orientation · Explain the "why" of each exercise and task prescribed for each child · Demonstrate the correct testing techniques · Assist in testing · Explain daily class procedure · Prepare the necessary forms	18	Self-explanatory
6	7	18 hours (9 weeks)	Implement Individualized Program · Record all data in individual fold-	18	Each student will receive a program based on *his specific needs and inter-*

APPENDIX A (Continued)
ACTIVITY CHECKLIST
MOTOR DISABILITIES AND LIMITATIONS

EVENT NUMBERS		ACTIVITY TIME	ACTIVITY DESCRIPTION	NETWORK NUMBERS	EXPLANATION
BEGINNING	ENDING				
			ers to reflect the format test, assess, prescribe, evaluate		*ests*
7	8	1½ hours	Retest and evaluate Individual Progress · Refer students to physician for possible release from program (where results are supportive of such a recommendation)	18	Students will be retested at nine-week intervals
8	9	18 hours (9 weeks)	Continue Program · Consideration should be given to possible revision of exercises stimulation of motivation, etc	18	Self-explanatory
8	10	½ hour	Recommend Flexible Scheduling · Prepare and submit supportive evidence for your recommendation · Prepare a list of games and activities for student participation when assigned to the unrestricted program	18	Students who can perform certain games and activities in the unrestricted program will be scheduled accordingly
8	11	½ hour	Refer to Physician for Program Release · Prepare and submit supportive evidence for your recommendation	18	Students will not be returned to the unrestricted program unless they have a signed release from the family or school physician

APPENDIX B
GLOSSARY

Abduction: Movement of a part away from the midline of the body.

Adduction: Movement of a part toward the midline of the body.

Ambulation: Ability to walk or to propel one's body in space (i.e., to locomote).

Ataxia: Injury to the cerebellum resulting in a muscular incoordination characterized by a lack of balance.

Atrophy: Wasting or shrinking in size.

Bilateral: Having two sides; pertaining to both sides.

Contractions: Isotonic – concentric = shortening
Isometric – static = remains same length
eccentric = lenghtening

Contracture: A state of permanent contraction of a muscle.

Diplegia: Paralysis affecting like parts on both sides of the body; bilateral paralysis – legs more often affected than arms.

Disuse atrophy: Wasting due to lack of use or exercise.

Dorsi flexion: Movement of the foot upward, thus decreasing the angle between the foot and the lower leg (i.e., tibia and fibula).

Dysfunction: Absence of complete normal function – differs from paralysis, in which there is less of function.

Eversion: Movement or turning of a part outward.

Extention: Straightening of a joint; movement of two surfaces away from each other, thus increasing the angle of the joint.

External rotation: Movement or turning of a part outward.

Flexion: Bending of a joint.

Flexometer: An instrument for measuring the amount of flexion of a joint.

Gait: A method or particular style of walking.

Goniometer: An instrument or device used for measuring angles.

Handicap: A limitation, hindrance, or impedance caused by a disability.

Hemiplegia: Excessive muscle tone.

Internal rotation: Movement or turning of a part outward.

Inversion: Movement or turning of a part inward.

Locomote: See ambulation.

Muscle spasm: An involuntary, convulsive muscular contraction.

Orthopedic: Pertaining to the correction of physical (skeletal) deformities.

Paraplegia: Paralysis of both legs and the lower part of the trunk.

Paresis: Incomplete paralysis, partial loss of function of extremity or extremities.

Plantar flexion: Movement of the sole of the foot downward, thus increasing the angle between the foot and the lower leg (i.e., tibia and fibula).

Poliomyelitis: Inflammation of the gray matter of the spinal cord.

Progressive muscular dystrophy: Metabolic disorder where there is degeneration and wasting of muscle tissue.

Pronation: Movement or turning of the palm of the hand downward.

Prone: To lie face down.

Quadriplegia: Paralysis or involvement of all four extremities.

Radial deviation: Movement of the wrist in the direction of the thumb.

Range of motion (ROM): The amount of motion a part or joint is capable of moving in both directions (e.g., flexion-extension; abduction-adduction).

Spastic: Resistance to stretch; spasm.

Spasticity: Involuntary contraction of affected muscles when they are suddenly stretched – called stretch reflex – resulting in tenseness and inaccurate, difficult voluntary movement.

Sprain: Stretching of a ligament, or connective tissue, beyond its physiological limit.

Supination: Movement or turning the palm of the hand upward.

Supine: To lie on the back (face up).

Therapeutic exercises: Exercises used for specific purposes in the science and art of healing.

Tonus: Partial contraction of a muscle, leading to muscle firmness or rigidity.

Triplegia: Paralysis of three limbs.

Ulnar deviation: Movement of the wrist toward the small finger of the hand.

APPENDIX C

TOWNSHIP OF OCEAN SCHOOL DISTRICT: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 6

1/75

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 200 YD. DASH		PERCENTILE	STANINE
Number of Pupils Tested – 143									
M	F	M	F	M	F	M	F		
68	31	60	72	60	54	38	40	99	9
39	22	36	40	54	49	39	41	96	8
27	16	30	31	50	47	40	43	90	8
21	13	28	25	48	45	42	45	80	7
20	12	26	23	46	44	43	46	75	6
17	11	24	23	44	43	44	47	70	6
15	10	21	22	42	41	44	48	65	6
15	10	20	20	42	40	45	48	60	5
13	9	15	17	40	39	47	49	50	5
11	6	13	13	38	38	49	50	40	5
10	6	12	13	37	37	50	51	35	5
8	6	10	12	36	37	51	53	30	4
7	5	9	11	34	36	52	54	25	4
6	5	8	10	32	35	53	55	20	4
4	3	3	6	24	31	58	59	10	3
2	1	2	3	9	27	65	66	4	2
0	0	0	0	0	0	66	67	1	1

AGE 7

60	58	100	100	59	57	35	36	99	9
42	32	50	40	55	51	37	38	96	8
31	25	40	33	51	48	39	40	90	8
24	15	30	25	48	46	40	43	80	7
21	14	26	23	48	45	41	44	75	6
19	13	24	21	48	44	42	44	70	6
17	11	21	20	47	43	43	44	65	6
15	10	20	20	46	42	43	45	60	5
13	8	18	17	44	41	44	46	50	5
11	7	15	15	42	40	45	47	40	5
11	6	14	14	42	39	46	48	35	5
10	5	13	13	40	38	47	49	30	4
9	5	12	12	40	38	47	50	25	4
8	5	10	11	39	37	48	51	20	4
6	4	8	7	36	35	52	53	10	3
5	2	5	4	34	33	55	56	4	2
0	0	0	0	0	0	56	57	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PEI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

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AGE 8

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RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 200 YD. DASH		PERCENTILE	STANINE
Number of Pupils Tested – 143									
M	F	M	F	M	F	M	F		
53	50	100	120	68	60	33	35	99	9
45	31	92	100	63	57	35	37	96	8
35	23	50	71	59	53	36	38	90	8
28	17	38	52	56	50	37	40	80	7
24	17	32	49	55	49	38	40	75	6
23	15	30	40	53	48	38	41	70	6
20	14	28	35	53	47	39	41	65	6
19	13	26	30	51	47	39	42	60	5
16	11	24	25	49	44	40	43	50	5
14	9	21	21	47	43	42	45	40	5
12	8	20	20	46	42	43	45	35	5
11	7	20	20	46	41	43	46	30	4
9	6	17	19	44	39	44	47	25	4
7	5	16	17	43	38	45	48	20	4
5	4	12	11	40	36	47	51	10	3
1	2	9	6	35	34	49	55	4	2
0	0	0	0	0	0	50	56	1	1

AGE 9

75	70	121	100	71	66	31	32	99	9
65	43	100	100	69	63	32	33	96	8
52	33	70	62	64	58	34	35	90	8
37	24	55	50	59	54	35	38	80	7
32	21	50	50	57	53	36	38	75	6
30	18	50	43	55	51	36	39	70	6
27	17	42	40	54	50	37	39	65	6
24	15	41	38	54	49	38	40	60	5
19	12	35	32	52	47	40	41	50	5
15	10	30	29	49	45	40	42	40	5
13	9	26	25	48	44	41	43	35	5
11	8	24	24	48	44	42	43	30	4
10	6	22	23	47	43	43	44	25	4
8	5	21	22	45	41	44	45	20	4
5	4	16	18	43	38	46	47	10	3
2	2	10	7	37	35	50	49	4	2
0	0	0	0	0	0	51	50	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

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AGE 10

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 200 YD. DASH		PERCENTILE	STANINE
Number of Pupils Tested – 143									
M	F	M	F	M	F	M	F		
80	63	125	121	70	67	30	30	99	9
69	50	100	100	65	64	32	32	96	8
57	40	89	85	63	61	33	33	90	8
41	25	55	63	60	56	34	35	80	7
37	23	52	57	59	56	35	36	75	6
32	20	50	50	58	55	35	36	70	6
29	17	50	45	57	54	36	37	65	6
25	15	45	42	55	53	36	37	60	5
20	12	38	40	53	51	37	38	50	5
16	10	32	32	51	49	38	39	40	5
14	10	30	30	50	49	38	39	35	5
13	9	28	27	49	48	39	40	30	4
10	7	24	25	48	47	40	41	25	4
8	6	21	23	48	44	41	42	20	4
5	4	18	20	44	41	44	44	10	3
1	2	13	15	41	37	47	50	4	2
0	0	0	0	0	0	48	51	1	1

AGE 11

90	83	125	125	76	74	30	30	99	9
83	58	125	125	74	72	31	33	96	8
64	38	90	100	70	70	32	34	90	8
45	31	70	63	67	67	33	36	80	7
42	26	68	68	65	64	34	36	75	6
39	24	64	60	64	63	34	37	70	6
35	21	60	58	64	62	35	37	65	6
33	19	54	51	63	61	35	38	60	5
27	15	50	50	62	60	36	39	50	5
22	13	47	40	60	58	37	39	40	5
20	12	43	36	58	57	38	40	35	5
18	10	37	35	58	55	38	41	30	4
14	8	32	30	55	54	39	42	25	4
12	7	30	30	52	52	40	43	20	4
8	4	25	22	50	48	41	45	10	3
2	2	21	17	42	46	44	49	4	2
0	0	0	0	0	0	47	51	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

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AGE 12

RAW SCORES ARM HANG M	ARM HANG F	RAW SCORES SIT-UPS M	SIT-UPS F	BROAD JUMP M	BROAD JUMP F	8-MINUTE RUN[1] M	8-MINUTE RUN[1] F	PERCENTILE	STANINE
Number of Pupils Tested – 143									
M	F	M	F	M	F	M	F		
86	65	125	117	80	82	5 0	4 1	99	9
74	60	125	100	76	75	4.7	4 0	96	8
62	45	122	80	73	72	4.4	3 6	90	8
45	34	101	69	72	69	4 3	3.4	80	7
42	31	90	64	70	68	4 2	3 3	75	6
39	31	75	60	68	67	4 1	3 3	70	6
35	25	68	55	67	67	4 0	3 2	65	6
32	23	65	52	66	66	4.0	3 2	60	5
28	18	60	50	64	63	3.7	3 1	50	5
23	14	55	45	62	62	3 5	3 0	40	5
20	13	51	43	61	60	3.4	3 0	35	5
19	12	43	40	60	59	3 4	2 6	30	4
17	10	40	40	60	58	3 2	2 6	25	4
16	9	35	35	58	56	3 1	2 4	20	4
8	5	27	28	52	51	3 0	2 3	10	3
5	4	20	22	48	47	2 7	2 2	4	2
0	0	0	0	0	0	2 4	2 1	1	1

AGE 13

94	65	125	105	89	78	5 6	4 1	99	9
79	60	125	100	83	77	5.0	3 6	96	8
64	40	125	80	78	73	4 7	3 5	90	8
51	33	100	60	73	71	4 4	3.4	80	7
45	29	100	59	72	70	4.4	3 3	75	6
43	28	87	52	72	69	4.3	3 2	70	6
39	26	77	50	72	68	4.2	3 1	65	6
37	23	72	50	71	68	4.2	3.1	60	5
30	20	50	45	69	65	4 1	3 0	50	5
24	15	50	40	65	62	4.0	2 7	40	5
21	13	49	37	65	61	3 7	2 7	35	5
20	12	45	35	63	60	3 6	2 6	30	4
17	10	40	32	62	60	3.5	2.5	25	4
13	10	38	30	60	58	3.4	2.4	20	4
9	5	31	25	58	56	3.3	2.4	10	3
6	4	25	20	51	51	3.0	2 1	4	2
0	0	0	0	0	0	2.4	1 7	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

[1]NOTE: Measured in laps (440 yards) and 1/8's of a lap (Thus, 4 0 reflects four complete laps, 3 7 reflects three complete laps, plus 7/8's of a lap.)

TOWNSHIP OF OCEAN SCHOOL DISTRICT: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 14 — 1/75

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 12-MINUTE RUN[1]		PERCENTILE	STANINE
Numbers of Pupils Tested – 163									
M	F	M	F	M	F	M	F		
103	75	125	100	96	84	8.1	6.3	99	9
82	57	120	70	94	80	7.5	5.6	96	8
75	45	101	55	84	75	7.3	5.3	90	8
65	34	100	49	81	72	6.7	4.7	80	7
62	32	100	45	80	71	6.6	4.6	75	6
55	29	86	42	78	70	6.4	4.6	70	6
49	24	85	40	76	68	6.4	4.3	65	6
48	22	79	35	75	67	6.3	4.2	60	5
44	19	66	31	73	66	6.0	4 0	50	5
38	15	60	26	72	64	5.7	3.7	40	5
36	15	60	25	71	63	5.5	3.7	35	5
34	13	55	23	69	62	5.4	3.5	30	4
27	11	50	21	67	60	5.3	3.3	25	4
24	8	50	20	65	59	5.2	3.0	20	4
15	5	35	15	61	55	4 6	2 7	10	3
8	1	26	12	58	51	3.7	2 0	4	2
0	0	0	0	0	0	3.4	1 9	1	1
AGE 15									
Number of Pupils Tested – 209									
126	70	125	90	100	89	8.5	8 1	99	9
105	58	121	71	96	80	7.4	6.0	96	8
86	37	110	57	91	77	6 7	5 6	90	8
73	30	101	50	87	72	6 4	5.1	80	7
68	28	100	45	86	71	6.3	5 0	75	6
65	25	100	42	84	70	6 2	4 7	70	6
61	24	100	40	84	69	6.0	4 7	65	6
60	22	100	40	83	68	5 7	4.7	60	5
54	18	80	35	80	66	5 7	4.5	50	5
48	15	70	30	78	64	5.4	4.3	40	5
46	13	65	30	77	63	5.3	4.2	35	5
43	12	60	30	76	62	5.2	4 1	30	4
38	10	55	28	75	60	5.1	4.1	25	4
34	8	54	26	73	59	4 7	4 0	20	4
22	5	45	20	70	54	4.3	3.6	10	3
15	4	32	12	66	52	3.6	3 1	4	2
0	0	0	0	0	0	3.1	2 1	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

[1]NOTE Measured in laps (440 yards) and 1/8's of a lap (Thus, 4 0 reflects four complete laps, 3 7 reflects three complete laps, plus 7/8's of a lap.)

APPENDIX C

TOWNSHIP OF OCEAN SCHOOL DISTRICT: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 16 1/75

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 12-MINUTE RUN[1]		PERCENTILE	STANINE
Number of Pupils Tested – 163									
M	F	M	F	M	F	M	F		
121	75	120	81	105	84	8.0	6.4	99	9
109	51	115	70	99	77	7.3	5.5	96	8
85	37	101	51	94	74	7.0	5.3	90	8
78	30	100	50	90	70	6.6	5.0	80	7
74	26	95	45	88	69	6.4	4.7	75	6
70	22	80	40	86	67	6.2	4.7	70	6
68	20	75	40	86	66	6.1	4.5	65	6
65	19	75	40	84	65	6.0	4.4	60	5
58	16	60	36	83	63	5.7	4.3	50	5
50	12	55	33	80	61	4.6	4.2	40	5
48	11	50	30	80	60	5.5	4.1	35	5
42	10	50	30	77	59	5.3	4.0	30	4
40	9	45	29	75	57	5.2	4.0	25	4
38	8	40	25	74	57	4.6	3.7	20	4
28	5	33	23	71	52	4.2	3.5	10	3
19	1	25	20	65	48	3.6	2.5	4	2
0	0	0	0	0	0	3.0	1.3	1	1
AGE 17									
Number of Pupils Tested – 181									
120	61	125	80	106	88	8.2	6.4	99	9
112	42	115	60	101	78	7.7	5.4	96	8
87	27	102	50	96	75	7.3	5.2	90	8
79	22	100	50	93	75	6.7	4.6	80	7
75	19	95	47	92	72	6.7	4.6	75	6
71	18	90	45	90	71	6.5	4.3	70	6
68	16	81	41	90	70	6.3	4.3	65	6
64	15	76	40	89	69	6.3	4.3	60	5
60	14	70	35	87	67	6.0	4.1	50	5
54	12	65	30	84	66	5.7	4.0	40	5
48	11	60	30	84	65	5.6	4.0	35	5
45	10	52	30	82	63	5.4	3.7	30	4
41	10	51	30	81	63	5.1	3.7	25	4
40	8	50	25	79	60	4.7	3.7	20	4
31	5	40	20	75	55	4.6	3.4	10	3
25	3	25	12	70	48	3.5	3.2	4	2
0	0	0	0	0	0	3.0	2.4	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

[1]NOTE Measured in laps (440 yards) and 1/8's of a lap. (Thus, 4.0 reflects four complete laps, 3.7 reflects three complete laps, plus 7/8's of a lap.)

APPENDIX C

STATE OF NEW JERSEY PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 6 9/75

RAW SCORES ARM HANG		SIT-UPS		BROAD JUMP		200 YD. DASH		PFI		%	STANINE
n=75	60	81	62	82		85	80	80	80		
M	F	M	F	M	F	M	F	M	F		
20	21	99	60	55	54	38	40	82	80	99	9
18	16	97	60	54	49	39	41	75	75	96	8
7	15	75	55	53	47	40	43	70	68	90	8
6	14	52	30	52	45	42	45	65	63	80	7
6	10	52	29	48	44	43	46	63	60	75	6
5	9	38	25	44	43	44	47	60	58	70	6
5	8	35	20	43	41	44	48	58	57	65	6
4	7	30	18	41	40	45	48	58	55	60	5
3	5	20	10	38	39	47	49	55	50	50	5
2	4	19	8	35	38	49	50	50	45	40	5
2	3	12	6	35	37	50	51	50	43	35	5
2	2	10	5	34	37	51	53	48	40	30	4
2	2	9	5	32	36	52	54	45	38	25	4
1	1	8	3	30	35	53	55	42	35	20	4
1	1	4	0	20	31	58	59	35	28	10	3
1	0	2	0	6	27	65	66	30	20	4	2
0	0	0	0	4	0	66	67	20	15	1	1

AGE 7

n=65	56	64	53	65	62	60	60	60	61		
M	F	M	F	M	F	M	F	M	F		
95	90	99	90	76	57	35	36	80	82	99	9
90	90	90	90	74	51	37	38	75	78	96	8
31	70	80	89	70	48	39	40	70	73	90	8
34	60	53	60	49	46	40	43	65	70	80	7
30	36	37	50	47	45	41	44	63	67	75	6
22	35	32	36	45	44	42	44	60	65	70	6
18	19	26	35	45	43	43	44	60	63	65	6
15	16	22	30	44	42	43	45	58	62	60	5
9	9	17	26	41	41	44	46	55	57	50	5
7	7	10	20	39	40	45	47	50	53	40	5
6	7	10	20	37	39	46	48	48	52	35	5
6	6	8	20	37	38	47	49	45	50	30	4
4	5	8	17	36	38	47	50	45	47	25	4
3	5	6	15	35	37	48	51	40	42	20	4
2	2	4	7	34	35	52	53	33	35	10	3
1	1	0	0	28	33	55	56	27	23	4	2
1	0	0	0	28	0	56	57	18	20	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

STATE OF NEW JERSEY: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 8

9/75

RAW SCORES ARM HANG		SIT-UPS		RAW SCORES BROAD JUMP		200 YD. DASH		PFI		%	STANINE
n=65	64	60		62	60	59	60	62	61		
M	F	M	F	M	F	M	F	M	F		
95	90	100	120	68	60	33	35	83	80	99	9
90	90	92	100	63	57	35	37	77	77	96	8
51	80	50	71	59	53	36	38	70	73	90	8
39	53	38	52	56	50	37	40	65	67	80	7
30	37	32	49	55	49	38	40	63	65	75	6
22	32	30	40	53	48	38	41	60	65	70	6
18	26	28	35	53	47	39	41	60	63	65	6
15	22	26	30	51	47	39	42	58	60	60	5
9	17	24	25	49	44	40	43	55	55	50	5
7	10	21	21	47	43	42	45	53	50	40	5
6	10	20	20	46	42	43	45	50	50	35	5
6	8	20	20	46	41	43	46	50	45	30	4
4	8	17	19	44	39	44	47	47	43	25	4
3	6	16	17	43	38	45	48	43	42	20	4
2	4	12	11	40	36	47	51	37	35	10	3
1	0	9	6	35	34	49	55	32	25	4	2
1	0	0	0	0	0	50	56	17	15	1	1

AGE 9

n=58	78	59	76	70	77	70	75	73	73		
M	F	M	F	M	F	M	F	M	F		
93	80	99	98	71	99	31	32	78	75	99	9
93	75	99	90	69	96	32	33	70	75	96	8
68	61	81	65	64	80	34	35	65	70	90	8
60	40	70	50	59	60	35	38	62	63	80	7
53	36	60	46	57	60	36	38	60	60	75	6
41	30	50	41	55	58	36	39	60	57	70	6
41	25	37	36	54	52	37	39	58	55	65	6
33	22	35	35	54	50	38	40	57	55	60	5
15	14	34	27	52	49	40	41	53	50	50	5
10	10	19	20	49	46	40	42	48	47	40	5
6	7	18	18	48	45	41	43	47	45	35	5
5	6	13	14	48	42	42	43	45	45	30	4
4	5	10	10	47	40	43	44	43	43	25	4
4	4	6	10	45	38	44	45	40	40	20	4
3	3	2	5	43	5	46	47	35	33	10	3
0	1	2	3	37	4	50	49	27	35	4	2
0	1	2	2	0	2	51	50	18	17	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

STATE OF NEW JERSEY: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 10

9/75

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 200 YD. DASH		PFI		%	STANINE
n=55	57	53	66	54	54	50	50	50	50		
M	F	M	F	M	F	M	F	M	F		
133	76	104	100	90	96	30	30	80	80	99	9
102	71	100	93	69	90	32	32	75	75	96	8
56	50	99	80	56	65	33	33	68	70	90	8
32	41	99	75	52	53	34	35	63	63	80	7
29	39	99	75	52	50	35	36	62	60	75	6
22	30	75	65	50	48	35	36	58	58	70	6
19	21	50	50	48	48	36	37	57	57	65	6
13	18	46	45	48	47	36	37	55	55	60	5
9	11	38	33	47	45	37	38	52	52	50	5
6	7	24	20	45	41	38	39	50	48	40	5
5	5	18	20	40	39	38	39	48	45	45	5
4	5	10	14	39	30	39	40	45	43	30	4
3	4	6	9	25	25	40	41	45	40	25	4
3	4	4	5	4	20	41	42	42	38	20	4
3	3	4	4	2	6	44	44	35	30	10	3
1	1	2	3	1	4	47	50	30	22	4	2
1	1	1	0	1	3	48	51	20	15	1	1

AGE 11

n=73	88	75	81	70	82	78	80	73	75		
M	F	M	F	M	F	M	F	M	F		
73	55	100	101	71	67	30	30	80	70	99	9
50	49	95	73	71	64	31	33	75	67	96	8
44	29	95	55	67	62	32	34	72	63	90	8
33	20	70	45	64	58	33	36	65	57	80	7
23	19	56	40	63	57	34	36	63	57	75	6
19	13	56	36	59	56	34	37	60	55	70	6
17	10	51	35	57	55	35	37	58	52	65	6
13	10	46	32	57	54	35	38	53	50	60	5
10	8	38	30	54	51	36	39	50	48	50	5
9	6	35	25	52	48	37	39	47	45	40	5
8	6	28	23	52	47	38	40	45	43	35	5
6	5	28	20	48	46	38	41	42	42	30	4
5	5	25	20	47	44	39	42	40	40	25	4
4	4	20	16	44	42	40	43	40	38	20	4
2	2	10	5	34	5	41	45	33	30	10	3
1	1	4	5	3	4	44	49	25	25	4	2
1	0	0	0	3	0	47	51	18	10	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

STATE OF NEW JERSEY: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 12

9/75

RAW SCORES ARM HANG		SIT-UPS		RAW SCORES BROAD JUMP		8-MIN. RUN		PFI		%	STANINE
n=140	93	125	103	136	120	175	163	90	92		
M	F	M	F	M	F	M	F	M	F		
86	70	125	79	80	82	39	41	80	80	99	9
74	60	125	76	76	75	38	40	80	70	96	8
62	41	122	71	73	72	35	36	78	63	90	8
45	32	101	65	72	69	34	34	68	58	80	7
42	29	90	64	70	68	33	33	65	55	75	6
39	25	75	63	69	67	32	33	63	53	70	6
35	20	68	60	67	67	31	32	63	53	65	6
32	16	65	59	66	66	31	32	62	50	60	5
28	14	60	58	64	63	30	31	62	45	50	5
23	10	55	57	62	62	29	30	53	43	40	5
20	9	51	56	61	60	28	30	50	40	35	5
19	7	43	54	60	59	27	26	50	40	30	4
17	6	40	53	60	58	26	26	48	38	25	4
16	5	35	51	58	56	24	24	44	33	20	4
8	3	27	44	52	51	23	23	33	28	10	3
5	2	20	10	48	47	23	22	23	23	4	2
0	1	0	3	0	0	19	21	15	10	1	1

AGE 13

n=90	70	80	120	94	128	98	100	69	68		
M	F	M	F	M	F	M	F	M	F		
94	81	125	120	89	81	46	41	85	85	99	9
79	75	125	116	83	78	39	36	80	83	96	8
64	66	125	110	78	75	38	35	73	75	90	8
51	50	100	100	73	72	35	34	68	68	80	7
45	47	100	100	72	71	35	33	68	68	75	6
43	45	87	90	72	71	34	32	65	63	70	6
39	38	77	85	72	69	33	31	63	60	65	6
37	35	72	80	71	68	33	31	60	60	60	5
30	24	50	74	69	65	32	30	60	55	50	5
24	20	50	69	65	63	31	27	55	55	40	5
21	15	49	60	65	62	30	27	55	50	35	5
20	15	45	54	63	60	29	26	52	48	30	4
17	13	40	50	62	58	28	25	50	45	25	4
13	11	38	45	60	55	27	24	50	43	20	4
9	4	31	15	58	30	25	24	43	34	10	3
6	4	25	4	51	10	20	21	28	28	4	2
0	2	0	4	0	4	16	17	15	18	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

STATE OF NEW JERSEY: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 14

9/75

RAW SCORES ARM HANG		RAW SCORES SIT-UPS		RAW SCORES BROAD JUMP		RAW SCORES 12-MIN. RUN		PFI		%	STANINE
n=298	449	236	315	282	300	225	215	201	202		
M	F	M	F	M	F	M	F	M	F		
103	70	120	120	97	87	56	41	83	84	99	9
87	61	111	101	91	82	50	36	78	80	96	8
71	50	103	96	85	79	47	35	70	73	90	8
62	44	96	80	81	75	44	34	65	68	80	7
59	40	89	80	79	74	44	33	63	65	75	6
56	37	80	75	77	74	43	32	60	63	70	6
49	34	74	65	75	72	42	31	59	60	65	6
48	30	65	61	74	72	42	31	58	60	60	5
40	24	58	55	72	69	41	30	53	55	50	5
35	20	50	48	69	67	40	27	48	50	40	5
32	18	48	46	68	65	37	27	48	50	35	5
28	16	42	41	67	64	36	26	45	45	30	4
25	15	40	39	65	62	35	25	43	45	25	4
20	13	32	33	62	61	34	24	40	40	20	4
10	9	25	26	55	57	33	24	33	32	10	3
4	4	16	20	25	52	30	21	25	22	4	2
1	2	1	13	3	25	24	17	18	4	1	1

AGE 15

n=313	309	304	293	307	308	290	270	288	288		
M	F	M	F	M	F	M	F	M	F		
110	69	150	110	100	85	85	41	83	82	99	9
86	58	130	85	94	81	74	36	78	77	96	8
78	40	130	73	90	77	67	35	74	70	90	8
71	30	125	60	87	73	64	34	70	65	80	7
69	27	117	55	86	72	63	33	68	62	75	6
66	24	108	53	84	71	62	32	65	60	70	6
61	21	10[illegible]	50	84	70	60	31	63	60	65	6
59	20	[illegible]	50	82	69	57	31	63	58	60	5
54	16	[illegible]	48	80	67	57	30	60	55	50	5
48	13	75	40	78	65	54	27	54	50	40	5
44	12	74	39	76	64	53	27	53	50	35	5
41	10	69	35	74	63	52	26	50	48	30	4
37	9	65	33	72	62	51	25	48	45	25	4
33	8	59	30	69	60	47	24	45	43	20	4
17	4	46	24	65	58	43	24	38	35	10	3
10	1	31	20	60	51	36	21	33	28	4	2
4	0	5	10	50	45	31	17	28	20	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	
4	10	12	30	20	50	28	70	
5	13	13	33	21	53	29	73	
6	15	14	35	22	55	30	75	
7	18	15	38	23	58	31	78	
8	20	16	40	24	60	32	80	
9	23	17	43	25	63	33	83	
10	25	18	45	26	65	34	85	
11	28	19	48	27	68	35	88	65
						36	90	

STATE OF NEW JERSEY: PHYSICAL FITNESS INDEX CONVERSION CHART

AGE 16

9/75

RAW SCORES						RAW SCORES					
ARM HANG		SIT-UPS		BROAD JUMP		12-MIN. RUN[1]		PFI		%	STANINE
n=259	292	277	281	275	295	265	270	250	252		
M	F	M	F	M	F	M	F	M	F		
119	66	189	100	102	82	80	64	85	82	99	9
98	51	146	84	99	80	73	55	78	78	96	8
89	38	128	70	94	76	70	53	75	72	90	8
79	29	105	52	90	72	66	50	68	66	80	7
74	26	100	50	88	71	64	47	63	65	75	6
72	23	98	50	87	69	62	47	63	63	70	6
68	20	93	50	86	68	61	45	60	60	65	6
63	17	86	50	84	68	60	44	60	60	60	5
58	14	75	48	83	66	57	43	58	55	50	5
50	11	64	40	80	63	46	42	53	52	40	5
48	10	60	40	79	63	55	41	53	50	35	5
46	10	58	37	78	61	53	40	50	50	30	4
42	9	53	35	75	61	52	40	45	48	25	4
39	7	49	32	74	59	46	37	45	46	20	4
28	4	41	30	70	57	42	35	40	40	10	3
17	1	30	21	65	49	36	25	32	32	4	2
5	0	5	16	6	30	30	13	20	27	1	1

AGE 17

n=198	194	184	225	197	211	181	181	175	177		
M	F	M	F	M	F	M	F	M	F		
105	64	198	100	99	83	82	64	83	85	99	9
94	46	145	75	98	79	77	54	78	78	96	8
89	36	126	65	96	76	73	52	73	70	90	8
78	30	123	53	94	72	67	46	63	67	80	7
74	28	120	50	93	72	67	46	60	65	75	6
71	24	113	50	90	70	65	43	58	63	70	6
67	21	98	50	89	69	63	43	58	60	65	6
64	19	98	49	87	69	63	43	55	60	60	5
59	16	85	42	85	67	60	41	53	56	50	5
54	13	70	40	83	64	57	40	50	52	40	5
51	10	64	35	83	63	56	40	48	50	35	5
48	9	57	31	81	62	54	37	45	50	30	4
45	8	54	30	79	61	51	37	43	47	25	4
45	7	49	30	78	60	47	37	43	45	20	4
30	4	35	20	70	56	46	34	35	38	10	3
20	3	21	15	66	50	35	32	27	27	4	2
3	2	5	4	48	30	30	24	13	17	1	1

COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI	COMPOSITE STANINES	PFI
4	10	12	30	20	50	28	70
5	13	13	33	21	53	29	73
6	15	14	35	22	55	30	75
7	18	15	38	23	58	31	78
8	20	16	40	24	60	32	80
9	23	17	43	25	63	33	83
10	25	18	45	26	65	34	85
11	28	19	48	27	68	35	88
						36	90

[1] Note: Measured in laps (440 yards) and 1/8's of a lap. (Thus, 4.0 reflects four complete laps; 3.7 reflects three complete laps, plus 7/8's of a lap.)

APPENDIX D

KINDERGARTEN MOTOR ABILITY TEST NORMS

(Courtesy of the Township of Ocean School District.)

	Gross Body Coordination	Balance Postural Orientation	Eye and Hand Coordination	Eye and Hand Accuracy	Eye and Foot Accuracy		
Number of Pupils Tested							
	RAW SCORES	RAW SCORES	RAW SCORES	RAW SCORES	RAW SCORES	PERCENTILE	STANINE
	10	24	18	16	15	99	9
	10	23	17	12	9	96	8
	10	21	16	10	7	90	8
	10	20	15	9	6	80	7
	10	19	15	9	6	75	6
	10	19	14	8	6	70	6
	9	18	14	8	6	65	6
	9	17	14	8	6	60	5
	8	16	13	7	5	50	5
	8	15	12	6	5	40	5
	8	14	12	6	4	35	5
	8	14	12	5	4	30	4
	8	13	11	5	4	25	4
	7	12	10	4	4	20	4
	6	9	8	2	3	10	3
	6	6	7	1	2	4	2
	4	3	4	0	0	1	1

Motor Ability Index Conversion Chart (MAI)

COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI
5	10	15	30	25	50	35	70
6	12	16	32	26	52	36	72
7	14	17	34	27	54	37	74
8	16	18	36	28	56	38	76
9	18	19	38	29	58	39	78
10	20	20	40	30	60	40	80
11	22	21	42	31	62	41	82
12	24	22	44	32	64	42	84
13	26	23	46	33	66	43	86
14	28	24	48	34	68	44	88
						45	90

APPENDIX D (Continued)

STATE OF NEW JERSEY: MOTOR ABILITY INDEX CONVERSION CHART

AGE 4

GROSS BODY COORD.		BALANCE-POST. ORIENT.		EYE-HAND COORD.		EYE-HAND ACCURACY		EYE FOOT ACCURACY		MOTOR ABILITY INDEX		%	STANINE
N=76		51		49		48		67		61			
M	F	M	F	M	F	M	F	M	F	M	F		
10		24		18		14		13		86		99	9
10		23		17		13		9		86		96	8
10		21		16		11		9		84		90	8
10		16		13		10		7		80		80	7
10		15		12		10		6		80		75	6
10		15		10		10		6		78		70	6
9		13		9		9		6		78		65	6
9		13		8		9		6		76		60	5
8		12		4		7		5		74		50	5
8		11		3		5		5		62		40	5
8		11		3		5		5		62		35	5
8		10		2		5		5		58		30	4
8		9		2		4		4		54		25	4
7		8		1		3		4		54		20	4
6		6		0		1		3		44		10	3
4		5		0		0		2		38		4	2
3		1		0		0		1		36		1	1

AGE 5

N=417	304	406	287	396	297	408	282	392	297	259	123		
M	F	M	F	M	F	M	F	M	F	M	F		
10	10	24	24	18	18	16	15	14	11	88	88	99	9
10	10	23	24	18	17	16	14	11	9	86	84	96	8
10	10	21	23	17	16	15	13	9	8	82	80	90	8
10	10	20	21	15	15	12	11	8	7	78	78	80	7
10	10	19	21	15	15	10	9	8	6	76	74	75	6
9	10	18	20	14	14	10	9	8	6	74	74	70	6
9	10	18	19	14	14	9	8	8	6	72	70	65	5
9	9	17	18	13	13	9	8	7	6	70	68	60	5
8	9	15	17	12	12	8	8	7	5	66	60	50	5
8	8	13	15	10	10	8	7	6	5	62	60	40	5
8	8	11	14	8	10	7	6	6	5	60	60	35	5
7	8	9	13	7	8	6	6	5	5	58	58	30	4
7	7	8	12	5	6	6	5	5	4	58	58	25	4
6	7	6	10	4	6	6	5	5	4	56	56	20	4
5	5	5	5	3	4	5	4	4	3	50	50	10	3
4	4	5	5	2	3	4	3	3	2	48	48	4	2
3	1	4	3	0	1	3	1	2	0	44	28	1	1

COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI
5	10	15	30	25	50	35	70
6	12	16	32	26	52	36	72
7	14	17	34	27	54	37	74
8	16	18	36	28	56	38	76
9	18	19	38	29	58	39	78
10	20	20	40	30	60	40	80
11	22	21	42	31	62	41	82
12	24	22	44	32	64	42	84
13	26	23	46	33	66	43	86
14	28	24	48	34	68	44	88
						45	90

Motor ability data was not available for females, age 4

STATE OF NEW JERSEY: MOTOR ABILITY INDEX CONVERSION CHART

AGE 6

GROSS BODY COORD		BALANCE POST		EYE-HAND COORD.		EYE-HAND ACCURACY		EYE-FOOT ACCURACY		MOTOR ABILITY INDEX		%	STANINE
N=179	125	206	127	258	120	183	99	150	83	186	103		
M	F	M	F	M	F	M	F	M	F	M	F		
10	10	24	24	18	18	18	17	10	10	88	82	99	9
10	10	24	24	18	18	15	14	10	9	86	78	96	8
10	10	22	23	17	17	13	12	9	8	82	74	90	8
10	10	20	21	15	14	10	10	8	8	74	70	80	7
10	10	19	20	15	14	9	8	8	8	72	70	75	6
9	10	18	18	14	13	8	8	8	8	70	68	70	6
9	9	16	16	13	12	8	8	8	8	68	68	65	6
9	9	15	15	12	10	8	8	8	8	66	66	60	5
8	9	12	11	9	7	7	7	8	7	64	64	50	5
8	8	9	8	8	6	6	6	7	5	60	58	40	5
6	6	8	8	6	6	6	6	6	5	59	56	35	5
6	6	6	7	6	5	6	5	5	4	58	56	30	4
6	6	6	7	5	5	6	5	5	3	56	54	25	4
5	5	5	6	5	4	5	5	3	2	52	54	20	4
5	5	5	5	3	4	4	3	2	0	48	45	10	3
3	4	3	5	3	3	3	3	0	0	38	36	4	2
1	3	0	4	1	1	0	1	0	0	32	28	1	1

AGE 7

N=218	206	272	206	204	194	237	158	246	169	169	100		
M	F	M	F	M	F	M	F	M	F	M	F		
10	10	24	24	18	18	16	14	15	15	90	84	99	9
10	10	24	24	18	18	15	13	14	14	86	80	96	8
10	10	24	24	18	18	12	11	12	12	82	78	90	8
10	10	22	22	17	17	10	10	10	10	82	72	80	7
10	10	21	22	16	17	10	9	9	10	72	68	75	6
10	10	21	21	16	16	9	9	9	9	72	66	70	6
10	10	21	21	16	15	9	8	8	8	70	64	65	6
9	10	20	18	15	15	8	8	8	8	70	62	60	5
9	9	18	17	14	14	8	8	8	8	64	58	50	5
8	8	16	15	13	12	8	7	7	7	62	56	40	5
8	8	15	15	12	11	7	6	6	6	60	54	35	5
8	8	11	12	12	8	7	6	6	6	58	54	30	4
8	7	8	9	10	7	6	6	6	5	56	52	25	4
6	6	8	8	9	6	6	6	5	4	52	50	20	4
5	5	5	5	6	3	4	4	3	2	40	42	10	3
4	3	4	5	5	3	3	2	1	1	32	28	4	2
2	1	3	3	4	1	1	0	0	0	17	17	1	1

COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI
5	10	15	30	25	50	35	70
6	12	16	32	26	52	36	72
7	14	17	34	27	54	37	74
8	16	18	36	28	56	38	76
9	18	19	38	29	58	39	78
10	20	20	40	30	60	40	80
11	22	21	42	31	62	41	82
12	24	22	44	32	64	42	84
13	26	23	46	33	66	43	86
14	28	24	48	34	68	44	88
						45	90

APPENDIX D (Continued)

STATE OF NEW JERSEY: MOTOR ABILITY INDEX CONVERSION CHART

AGE 8

GROSS BODY COORD.		BALANCE-POST. ORIENT.		EYE-HAND COORD.		EYE-HAND ACCURACY		EYE-FOOT ACCURACY		MOTOR ABILITY INDEX		%	STANINE
N= 82	55	58	71	62	61	63	44	62	48	83	51		
M	F	M	F	M	F	M	F	M	F	M	F		
10	10	24	24	18	18	16	18	14	18	88	96	99	9
10	10	24	24	18	18	16	16	11	18	88	96	96	8
10	10	24	24	18	18	14	16	10	16	86	94	90	8
10	10	24	21	17	16	12	14	9	15	84	92	80	7
10	10	24	21	17	16	11	14	8	15	80	90	75	6
10	10	23	20	16	16	10	12	8	14	76	86	70	6
10	10	23	18	16	16	9	12	7	12	72	78	65	6
10	10	22	18	14	15	9	11	7	12	70	74	60	5
10	10	21	15	13	14	8	10	6	10	66	64	50	5
10	8	18	12	10	12	5	8	5	8	58	60	40	5
10	8	17	10	9	11	5	8	5	7	54	60	35	5
9	8	15	10	8	10	4	7	4	6	54	54	30	4
9	8	14	8	7	9	4	6	3	4	52	52	25	4
8	6	12	8	7	9	4	5	3	4	50	50	20	4
5	5	5	4	6	6	3	4	2	1	40	38	10	3
4	4	5	2	5	4	3	4	0	0	18	30	4	2
3	1	5	2	4	2	1	2	0	0	13	18	1	1

COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI	COMPOSITE STANINES	MAI
5	10	15	30	25	50	35	70
6	12	16	32	26	52	36	72
7	14	17	34	27	54	37	74
8	16	18	36	28	56	38	76
9	18	19	38	29	58	39	78
10	20	20	40	30	60	40	80
11	22	21	42	31	62	41	82
12	24	22	44	32	64	42	84
13	26	23	46	33	66	43	86
14	28	24	48	34	68	44	88
						45	90

APPENDIX E

BEHAVIORAL PERFORMANCE CHART

Student's Name _____ School _____ Sex _____ Grade _____
Last First

COMPETENCY AREA	PERFORMANCE OBJECTIVE/EVALUATIVE CRITERIA	SCORE PRE	SCORE POST	% GAIN	PASS OR FAIL PRE	PASS OR FAIL POST
DEVELOPMENTAL PROGRAM	THE STUDENT:					
Low Physical Vitality	1. Achieves a minimum Physical Fitness Index Score of 50, or a single stanine score of 4 on the Township of Ocean Physical Fitness Test Battery, grades 1-12, (Note: students with a PFI Score of 35 or below, or a single stanine score of 2 or below are to be referred to D&A. Record raw scores and pass or fail.)					
	2. Identifies his primary and secondary somatotyping characteristics, 9-12 (pass or fail).					
	3. Computes his percentile/stanine scores and identifies his weaknesses and strengths on a continuum, grades 9-12 (pass or fail).					
	4. Demonstrates a more positive self-concept as evidenced by the Self-Concept Pictorial Scale, grades 1-4 (raw score and pass or fail). (10%)					
	5. Demonstrates a more positive attitude toward physical activity, as evidenced by the Wear Attitude Inventory, grades 5-12 (raw scores and pass or fail). (10%)					
Low Motor Ability	1. Achieves a minimum Motor Ability Index Score of 50, or a single stanine score of 4 on the Township of Ocean Motor Ability Test Battery, grades K-2. (Note students with an MAI score of 35 or below or a single stanine score of 2 or below are to be referred to D&A.) (Record raw scores and pass or fail.)					
	2. Performs his prescribed motor tasks correctly, grades K-2 (pass or fail).					
	3. Demonstrates a more positive self-concept as evidenced by the Self-Concept Pictorial Scale, grades K-4 (raw scores and pass or fail). (10%)					

APPENDIX E (Continued)

COMPETENCY AREA	PERFORMANCE OBJECTIVE/EVALUATIVE CRITERIA	SCORE PRE	SCORE POST	% GAIN	PASS OR FAIL PRE	PASS OR FAIL POST
Adapted Program *(Continued)*	1. Demonstrates a 10% improvement in those physical fitness/motor ability items he can perform, grades K-12 (raw scores and pass or fail).					
	2. With atrophied muscles, evidences a 5% increase in muscle girth measurements, grades K-12 (raw scores and pass or fail)...					
	3. With atophied muscles, demonstrates a 10% increase in muscular strength, grades K-12 (raw scores and pass or fail.)					
	4. With a range of motion limitation, evidences a 5% increase in flexibility, K-12 (raw scores and pass or fail).					
	5. Demonstrates the ability to determine his muscle girth measurements, Strength Decrement Index and range of motion, grades 9-12 (pass or fail).					
	6. Manifests a positive self-concept or attitude toward physical activity (10% improvement) grades K-12 (raw scores and pass or fail).					
	7. Who utilizes crutches, demonstrates proficiency in ambulatory skills (i.e., walking, climbing and descending stairs unassisted, grades K-12 (pass or fail).					
	8. Evidences a desire to participate in physical activity modified commensurate with his needs, as evidenced by increased participation in physical education/recreation activities, grades K-12 (pass or fail).					

APPENDIX F

PROJECT ACTIVE
SUPPLY AND EQUIPMENT NEEDS FOR PROGRAM IMPLEMENTATION

To: Adopting School Districts/Agencies

From: Dr. Thomas M. Vodola, Director, Project ACTIVE

Re: Supply/Equipment Needs for Program Implementation

The appended tables provide specific information relative to supply and equipment needs for program installation. The format has been designed to facilitate the identification of items for those who are adopting or adapting one phase of the program, or the total program. The information supplied includes:

- The specific item
- Essential items needed (coded with an "N")
- The number of items needed
- Items recommended (coded with an "R")
- The unit price of each item
- The source of the item

The tables reflect the basic needs for implementing the program in one school. It is recommended that one set be purchased for each additional school involved. (If a district has some of the items on hand, it obviates the need for that expenditure.)

Project Director
Thomas M. Vodola, Ed.D.
Township of Ocean School District
Ocean Township Elementary School
Dow Avenue
Oakhurst, N.J. 07755
201–229-4100 Ext. 260

APPENDIX F. (Continued)

PROJECT ACTIVE SUPPLY/EQUIPMENT NEEDS[1]

COMPONENT ADOPTED ITEMS	TOTAL PROGRAM N	R	Cost	Source	Items Needed	LOW MOTOR ABILITY N	R	LOW PHYSICAL VITALITY N	R	NUTRITIONAL DEFICIENCIES N	R	BREATHING PROBLEMS N	R	POSTURAL ABNORMALITY N	R	MOTOR DISABILITIES N	R	COMMUNICATION DISORDERS N	R
PC5026 Shoulder Breadth, Length Caliper	X		74 90	J A. Preston Corp. 71 Fifth Avenue N.Y., N.Y. 10003	1					X									
PC5028 Large Skinfold (Fat Caliper)	X		142.45	J.A Preston	1					X									
PC5155 Dry Spirometer	X		176.85	J.A. Preston	1							X							
PC5156 Disposable Paper Mouthpieces	X		31 60	J A. Preston	500							X							
PC5059 Flexometer		X	246 65	J.A Preston	1														
or PC5054 Plastic Goniometer (Transparent)	X		20 20	J.A. Preston	1											X			
PC5022A Symmetrigraf (Posture Grid)	X		80.60	J A. Preston	1									X					
No. 306 Stall Bars, Starter Unit (optional)		X		Nissen Corp. 930 27th Ave. Cedar Rapids, Iowa	1										X				
No. 39 Wall Mounted Horizontal Ladder (optional)		X		Nissen Corp	1										X				X
or Construct Horizontal Ladder (optional)		X		Maintenance Dept.	1										X				
No. 92602 Utility Playground Ball, PG8½	X		3.00	J L Hammett Co. 2393 Vaux Hall Rd. Union, N.J 07083	12	X										X			
No 92655 Fun Balls (Plastic) S-650	X		.55	J.L. Hammett Co.	12	X										X			

[1] Contact source for unlisted prices

APPENDIX F (Continued)

PROJECT ACTIVE SUPPLY/EQUIPMENT NEEDS

COMPONENT ADOPTED ITEMS	TOTAL PROGRAM				Items Needed	LOW MOTOR ABILITY		LOW PHYSICAL VITALITY		NUTRITIONAL DEFICIENCIES		BREATHING PROBLEMS		POSTURAL ABNORMALITY		MOTOR DISABILITIES		COMMUNICATION DISORDERS	
	N	R	Cost	Source		N	R	N	R	N	R	N	R	N	R	N	R	N	R
No 92670 Saf T Bat (Plastic) No 705	X		2 25	J.L. Hammett Co	3	X										X			
Plastic Measuring Tape 36"	X			Local Fabric Shop				X		X				X					
White Shoe Polish, Bottle	X		55	Local Supermarket	3	X		X						X		X			
No 39170 Water Color Marking Pen, Black	X		40	J L. Hammett	1									X					
No 61145 Pegboard and Pegs, No 7615 (optional)		X	3 45	J L Hammett	6 sets		X										X		
PEC1064 Walk On Letters	X		29 85	J.A. Preston	1 set	X													
No 9201 Audible Ball Electronic	X			Royal Nat'l Inst. for the Blind, 224-6-8 Great Portland St London, W-1, England	1													X	
No 92663 Audi-Ball, No AB 30 (optional)		X		J L Hammett	1													X	
No 1-0357 Staley Sports Field Kit (optional)				American Printing House for the Blind 1839 Frankfort Ave P O Box 6085 Louisville, Kentucky 40206	1														
No 1-0304 Portable Audible Goal Locator		X		American Printing House for the Blind	1													X	
Barbells		X		J.L. Hammett	1				X		X				X		X		

APPENDIX F (Continued)

PROJECT ACTIVE SUPPLY/EQUIPMENT NEEDS

COMPONENT ADOPTED ITEMS	TOTAL PROGRAM				Items Needed	LOW MOTOR ABILITY		LOW PHYSICAL VITALITY		NUTRITIONAL DEFICIENCIES		BREATHING PROBLEMS		POSTURAL ABNORMALITY		MOTOR DISABILITIES		COMMUNICATION DISORDERS	
	N	R	Cost	Source		N	R	N	R	N	R	N	R	N	R	N	R	N	R
Stopwatch	X			J L. Hammett	1	X		X		X		X							
PEC2747A Beanbag Game		X	50 45	J A. Preston	2														
PEC2747B Beanbag Set		X	32 40	J.A Preston	1												X		
Chinning Bar	X			Nissen Corp.	2			X									X		
Mats, 5' x 10'	X			Nissen Corp.	3	X		X							X		X		X
No 92882 Number 3 Fleece Balls	X		1 50	J L Hammett	3	X						X		X		X		X	
No 92645 Number CT850 Endure Tetherball	X		10.90	J.L Hammett	1	X										X		X	
PEC4806 Walk-On Number Kit	X		17.85	J.A. Preston	1 set	X										X			
No. 92656 Number S-630 Fun Balls	X		40	J L. Hammett	12	X													
No 84252 Rubber Quoit Set	X		5.65	J L. Hammett	1 set	X										X			
No. 60676 Footsteps to Numbers, 6076	X		8.00	J L Hammett	1 set	X													
No 92730 Jump Rope (7')	X		1 30	J.L. Hammett	6			X		X		X							
Shape O Ball		X		Tupperware Products	1	X													
PEC2600 Doorway Chinning Bar		X	14.95	J.A Preston	1				X										X
PEC2766A Deluxe Safe-T-Play Batting Set		X	56 90	J A Preston	1		X											X	
PEC2771B Pitch Back		X		J A Preston	1		X											X	
Masking Tape		X		Local Store	6 roll		X											X	

APPENDIX F (Continued)

PROJECT ACTIVE SUPPLY/EQUIPMENT NEEDS

COMPONENT ADOPTED ITEMS	TOTAL PROGRAM				Items Needed	LOW MOTOR ABILITY		LOW PHYSICAL VITALITY		NUTRITIONAL DEFICIENCIES		BREATHING PROBLEMS		POSTURAL ABNORMALITY		MOTOR DISABILITIES		COMMUNICATION DISORDERS	
	N	R	Cost	Source		N	R	N	R	N	R	N	R	N	R	N	R	N	R
LP6050 Coordination Skills		X	12.95	Kimbo Educational P.O. Box 246 Deal, N.J. 07723	1		X												
EA606 7 Developing Perceptual Motor Needs		X	12 95	Kimbo Educational	1		X												
EA605 Developing Body Awareness		X	6.50	Kimbo Educational	1		X										X		X
EA655 Relaxation		X	6.50	Kimbo Educational	1		X						X		X		X		X
EA657 Dynamic Balance		X	12 95	Kimbo Educational	1		X												X
EA658 Balance Beam Activity		X	12.95	Kimbo Educational	1		X												
EA656 Pre-Tumbling Skills		X	12.95	Kimbo Educational	1		X												X
LP5000 Developing Body-Space Perception Motor Skills CM1056, 1058, 1079		X	15 75	Kimbo Educational	1		X										X		X
LP5000 Teaching Children Mathematics through Games		X	12.95	Kimbo Educational	1		X												
LP8060 To Move Is To Be		X	12.95	Kimbo Educational	1		X												
LP4000 Rhythmic Rope Jumping		X	10 95	Kimbo Educational	1		X		X		X		X						X
4022 34 Developing Exercises		X		Dance Records, Inc. Waldwick, N.J. 07463	1				X				X						
4008 Elementary School Exercises to Music		X		Dance Records, Inc.	1		X		X				X						X
Foot Disinfectant	X			Local Drug Store	1 Gal.									X				X	

APPENDIX G TEACHER'S CERTIFICATE OF ACHIEVEMENT

The State of New Jersey

Department of Education

AND

PROJECT ACTIVE

ALL CHILDREN TOTALLY INVOLVED EXERCISING
Project No. 72-34[illegible] [illegible] P.L. 89-10

Hereby Acknowledges With Sincere Appreciation The Completion Of The Mini-Inservice Training Course For Physical Education, Special Education, And Recreation Teachers Working With Handicapped Children.

By

____

This course consisted of ten, four-hour sessions, lecture-demonstrations on individualizing instruction and practicum work experiences with handicapped children; and developing specific competencies.

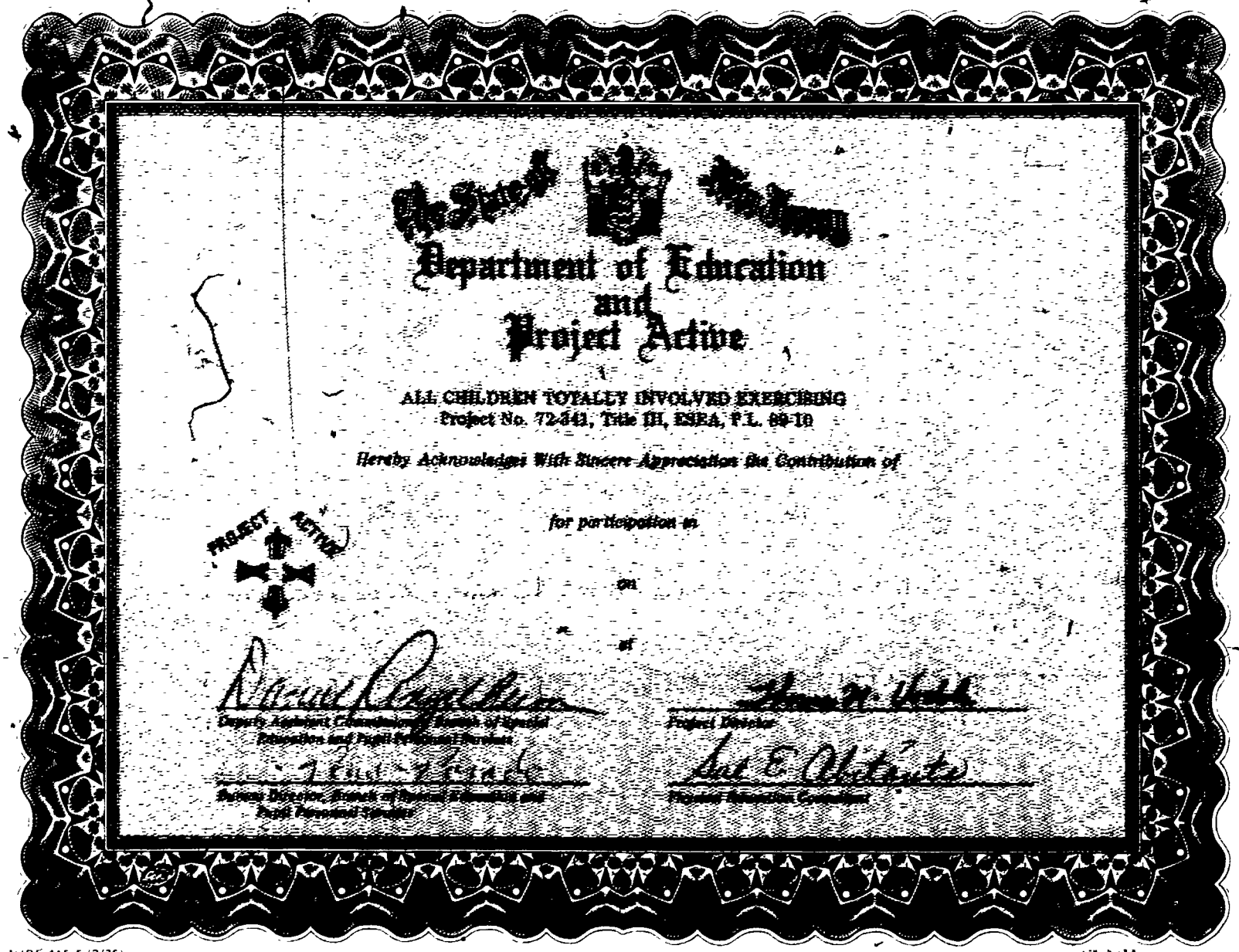
Project Director

Branch of Special Education & Pupil Personnel Services

Date

Physical Education Consultant

APPENDIX H STUDENT'S CERTIFICATE OF MERIT



Department of Education
and
Project Active

ALL CHILDREN TOTALLY INVOLVED EXERCISING
Project No. 72-341, Title III, ESEA, P.L. 89-10

Hereby Acknowledges With Sincere Appreciation the Contribution of

for participation in

on

at

PROJECT ACTIVE

Deputy Assistant Commissioner, Bureau of Special Education and Pupil Personnel Services

Bureau Director, Bureau of Special Education and Pupil Personnel Services

Project Director

Project Education Specialist

NJDE 415 5 (3/75)

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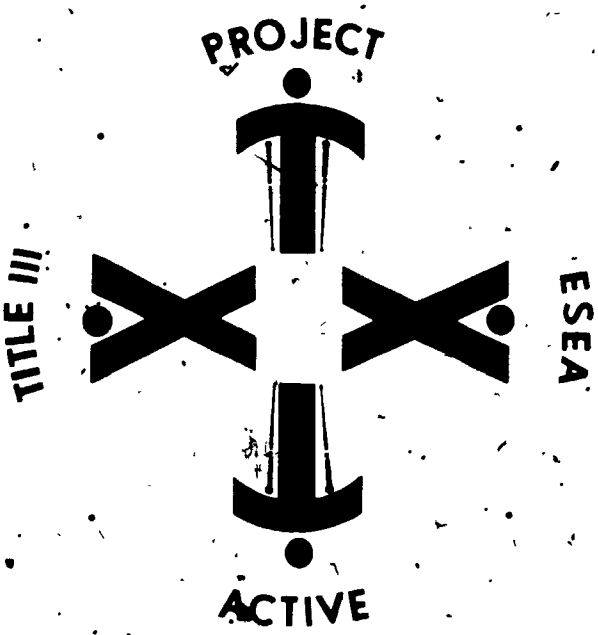
PROJECT
TITLE III
ESEA
ACTIVE