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CONSTRUCTION OF AN INSTRUMENT FOR
ASSESSING COGNITIVE LEARNING BASED
UPON "READY? SET... GO!" A TELEVISION
COURSE FOR ELEMENTARY PHYSICAL
EDUCATION/LEVEL ONE.

The University of North Carolina at
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CONSTRUCTION OF AN INSTRUMENT FOR ASSESSING COGNITIVE
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A TELEVISION COURSE FOR ELEMENTARY
PHYSICAL EDUCATION/LEVEL ONE

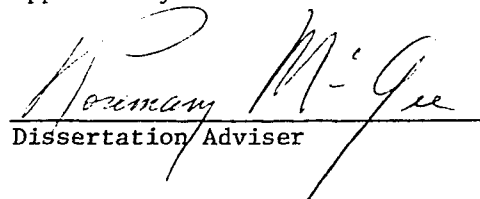
by

Virginia Hart

A Dissertation Submitted to
the Faculty of the Graduate School at
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in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

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Approved by


Dissertation Adviser

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Dissertation
Adviser

Norman M. Gee

Committee Members

Maude Riley
Gail M. Dennis
Kate T. Barrett
Nancy White

March 22, 1976
Date of Acceptance by Committee

HART, VIRGINIA. Construction of an Instrument for Assessing Cognitive Learning Based Upon "Ready? Set... Go!" A Television Course for Elementary Physical Education/Level One. (1976) Directed by: Dr. Rosemary McGee. Pp. 208.

The major purposes of this study were to construct a group-administered paper-and-pencil test for first and second graders to assess knowledges and understandings based on "Ready? Set... Go!" a television course for elementary school physical education/Level One and to establish the validity and reliability of the instrument.

The subpurposes included the testing of the following hypotheses:

1. There will be no significant difference in the cognitive scores of boys and girls.
2. There will be no significant difference in the cognitive scores of first- and second-grade children.

The cognitive objectives in the "Ready? Set... Go!" Teacher's Manual were identified and classified according to Bloom's (1956) Taxonomy of Educational Objectives. Only the objectives which could be measured with a group paper-and-pencil pictorial test were included. A two-way table of specifications was constructed to insure adequate coverage of the content at the appropriate behavioral level and to avoid construction of too many or too few items on a topic or a particular type of behavior.

The 33-item "Ready? Set... Go!" Knowledge Achievement Test was administered to 159 first- and 11 second-grade children in Oklahoma and North Carolina in May, 1975, following the final lesson of the "Ready? Set... Go!" television series.

In the preliminary administration of the test, results of the t-test indicated that the mean score for second graders was significantly higher than the mean score for first graders at the one per cent level of significance. Results of the final administration indicated that the mean scores for boys and girls did not differ significantly. There was no significant difference in the mean scores for North Carolina and Oklahoma children.

The instrument was reviewed and judged by a jury of experts, and curricular validity was established. Internal validity was confirmed by using Flanagan's Item Analysis technique. Index of discrimination, difficulty rating, and the functioning of the test items were determined. The Kuder-Richardson Formula 20 yielded a reliability coefficient of .7334. Considering such factors as the age of the subjects, the testing environment, and the uniqueness of the pictorial nature of the test involving perception as well as cognition, the test appeared very acceptable. It was constructed specifically to coincide with the "Ready? Set... Go!" television course but seems applicable to programs of physical education which espouse similar objectives.

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CHAPTER I

INTRODUCTION

In his "house divided" address accepting the Republican Senatorial Nomination on June 16, 1858, Abraham Lincoln said words to this effect: If we can determine where we are and where we are going we can better decide what to do and how to do it. In essence, Lincoln was saying that "the most efficient results are attained when the worker has definite goals toward which to work and dependable instruments for determining progress" (Greene, Jorgensen and Gerberich, 1942, p. 2).

In any curriculum design the program objectives must be clearly stated and understood. Some means are necessary to evaluate the effectiveness of the program in relation to the defined goals. If no instruments are available to assess mastery of objectives, someone must undertake the task of constructing appropriate tests. It is the general consensus among test builders that teachers should know how well the program objectives have been accomplished (Klein, 1965; Shah, 1969; Lindquist, 1951).

A review of literature indicated that the necessity of providing tests for curriculum evaluation had been seriously neglected (Lindquist, 1951). There was a particular absence of work in the area of assessing cognitive learning on the primary level. What had been done had usually started at the fourth grade level with no attention to the primary and early childhood ages. Bauernfeind (1963) attested to this fact and

added that testing programs are incidental or nonexistent in the early primary grades. He speculated on the reasons for this condition, several of which follow:

1. Scores at the primary level may be reliable at the time of testing but will probably not have long-term validity and reliability.
2. It is assumed that children in primary grades cannot handle separate answer sheets and that individual test booklets would be unreasonable in cost.
3. Teachers in the primary grades are more intimately involved with pupil achievement than teachers of later grades; thus, a test would add little to what the teacher has already observed.
4. In the early grades the child learns to read and in later grades he reads to learn.

For these reasons, test publishers often do not provide tests for use until grades four and above.

Instruments used at the primary level can require no reading or writing on the part of the subject (Anastasi, 1968; Askov, 1972). The reading and writing limitation can be overcome, however, by use of pictures and by having the teacher or examiner read the questions. Since most test constructors are not artists and do not have the assistance of competent artists, an additional problem presents itself. The items must be drawn so that the situation represented receives proper emphasis. Otherwise the items may defeat their own purpose.

Tests designed for the primary level are most often intended to be administered individually. For practical purposes, group tests are preferable. It is feasible, according to Anastasi (1968), to use group tests as early as kindergarten and first grade if instructions are given orally.

Stewart (1970) suggested that the test which is of greatest assistance to the person making instructional decisions should be reliable and should represent the content of the curriculum. The test should be group-administered and should require a brief period of time. Stewart (1970) recognized that evaluation will have a new role in the open classroom environment where the concept of individually guided instruction is employed.

Tests presently available are generally in the areas of readiness, achievement, intelligence, and mental ability; they are broad in scope, provide a wealth of information about children, and are vital to the school. A case could be made for more effective standardized testing in the lower grades.

According to Garrett (1959, p. 3), mental tests designed to measure intelligence or aptitude tell "how much a child can learn" without reference to what pupils have learned either in or out of school. Greene, Jorgensen and Gerberich (1942, p. 10) stated that "educational tests have as their primary function the measurement of the results or effects of instruction and learning." A teacher who carefully selects or states an objective is attempting to insure that the test deals with the educational outcomes he wishes to measure and is geared to the proper level of difficulty for the pupils.

Ahmann (1962, p. 1) quoted Lord Kelvin as follows: "When you can measure what you are speaking about and express it in numbers, you know something about it." He related the comment to the area of testing and its impact on schools as they seek to determine the individual differences present in children and the degree of behavioral change resulting from educational experiences. These processes are influenced by the degree of validity and reliability of the instrument.

Evaluation is oriented toward instructional objectives. The evaluator wishes to know whether pupil behavior has changed to an appropriate degree and direction; thus the evaluator must have a concise idea of what these objectives are. With the objectives clearly stated, a set of evaluation devices in the form of tests can be constructed. The evaluation process is without question tied to instructional objectives; the teacher, therefore, must teach and evaluate in terms of these objectives.

Ahmann (1962) continued by stating that when student behavioral patterns are elicited in a natural situation, the student behavior is more spontaneous in the ordinary course of events and is not influenced by artificial forces in an unrealistic way. He considered this an ideal manner in which to observe pupils' behavior but recognized the difficulty of arranging situations which provide such a natural setting. Because these natural situations are not commonly available, the classroom teacher is compelled to develop artificial situations which resemble natural situations. The administration of a test to assess behavior as it relates to instructional objectives is primarily an artificial

situation as far as evaluation is concerned. There could be, however, a degree of similarity between results from the natural and the artificial situations.

Paper-and-pencil tests in the cognitive domain closely approximate the natural situation. Since the cognitive domain is considered by many to be the most important domain, it is not surprising to find that paper-and-pencil tests have dominated the educational scene. Ahmann (1962) concluded that paper-and-pencil tests should be used only when they provide the most meaningful information concerning the pupil's behavior.

Through a review of the literature the need for constructing tests designed to assess achievement in the area of cognitive learning was recognized. The need was especially obvious at the primary level. In view of this need the writer selected a television series as a basis for constructing such a test. It was selected for the following reasons: (1) it implements new ideas and trends in elementary physical education; (2) it is presented in what has been described as a natural situation; and (3) its lesson objectives are clearly stated in behavioral terms.

An instrument in the form of a paper-and-pencil test was constructed to assess cognitive learnings in the area of knowledges and understandings. The test was based on "Ready? Set... Go!" a television course for elementary physical education/Level One. Test items were designed in pictorial form and administered to the subjects for the purpose of determining whether or not the program as presented in the television series was meeting the cognitive objectives for which it was originally planned.

Statement of the Problem

The primary purposes of this study were as follows:

1. To construct a group-administered paper-and-pencil test for first and second graders to assess knowledges and understandings based on "Ready? Set... Go!" a television course for elementary school physical education/Level One
2. To establish the validity and reliability of the instrument

Subpurposes included the testing of the following hypotheses:

1. There will be no significant difference in the cognitive scores of boys and girls.
2. There will be no significant difference in the cognitive scores of first- and second-grade children.

Delimitations of the Study

There were several delimitations of the study:

1. The amount of available literature in the area of testing at the primary level was limited, especially in physical education.
2. The number of television programs pertaining to primary physical education was also limited.
3. The population sample was limited because the "Ready? Set... Go!" television series was not generally administered as originally planned.

4. The sampling was by entire classroom groups rather than by randomly selected individuals within the group. Any children with learning disabilities and mental deficiencies were not identified.
5. The test was in pictorial form and the questions were read by the examiner; visual and auditory perceptions were therefore involved. Listening is often more complex than reading.
6. The presentation of the instructions and questions was not controlled. Individual teachers read the questions orally in the natural classroom environment. Variations in the speed of reading, attitude, and pronunciation would be expected.
7. The testing situations were not controlled. Reliability of the test could have been altered by distractions and other environmental factors.

Definition of Terms

Achievement tests. Achievement tests are "those which measure pupils' mastery of subject matter taught in school" (Broome, 1939, p. 14).

Basic movement experiences. Basic movement experiences are "the continuing experiences designed to give the child a movement foundation which serves as a basis for future movement instruction and equips him for other movement demands of life" (Logsdon and Barrett, 1969, p. 4).

Cognitive domain. Cognitive is the domain which "includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills" (Bloom, 1956, p. 7).

Content validity. Content validity is the extent to which a test measures a representative sample of the subject matter and behavioral changes under consideration (Gronlund, 1965, p. 62).

Elementary level. Elementary level includes grades one through six.

Lesson objectives. Lesson objectives are directional objectives structured in behavioral terms. They contain the content and the behavior sought for the purpose of providing "guidelines for assessing the responses of children" (Logsdon and Barrett, 1969, p. 8).

Movement education. Movement education is regarded as being synonymous with physical education which is "a child's education in and through movement" (Tanner and Barrett, 1975, p. 19).

Primary level. Primary level includes grades one through three.

CHAPTER II

REVIEW OF LITERATURE

An examination of Chapter I will reveal the breadth involved in the construction of an instrument designed to assess cognitive learnings based on a television program. The television program was in the area of physical education and was designed for children at the primary school level. Thus it seems appropriate that the literature should be reviewed in several areas. Chapter II will focus on the cognitive development of the six- and seven-year-old child, physical education at the elementary school level (more specifically the primary level, with emphasis on the movement education concept), and television instruction. Test construction was also considered an important area to investigate and was incorporated into the topics reviewed and the procedure.

The Child

Cognitive Development of the Six- and Seven-Year-Old Child

In an article entitled "Children's Thinking," Hazlett (1930, p. 360) stated:

Writing some years ago, Professor Purtt declared that he found no evidence of any specific process of thought that could not be performed by a child of seven. I should like to suggest that, from the evidence that is accumulating, it seems likely that there is no age limit in relation to the process of thinking, beyond that imposed by lack of experience.

Bruner (1960) hypothesized that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development." Bruner (1960, p. 33) further stated that:

The general hypothesis that has just been stated is premised on the considered judgment that any idea can be represented honestly and usefully in the thought forms of children of school age, and that these first representations can later be made more powerful and precise the more easily by virtue of this early learning (Bruner, 1960, p. 33).

Bruner proceeded to cite Piaget's stages of intellectual development. In a later work Bruner (1964, p. 2) introduced three modes of representation, namely enactive, iconic, and symbolic thought. These closely parallel Piaget's stages of intellectual development. In fact, Biehler (1971) made a comparison of Bruner's and Piaget's stages of intellectual development and found them quite similar. Piaget's theory, however, will be used as a guide for the review of the cognitive development of the six- and seven-year-old child.

In a study entitled Piaget's Theory of Cognitive Development, Wadsworth (1971, p. 9) used the term "cognitive acts" which he defined as "acts of organization of and adaptation to the perceived environment." Almy, with Chittenden and Miller, (1966, p. 13) used the term "cognitive systems" rather than cognitive acts. Wadsworth (1971) elaborated on the terms adaptation and organization and quoted Piaget (Wadsworth, 1971, p. 10):

From the biological point of view, organization is inseparable from adaptation: They are two complementary processes of a single mechanism, the first being the internal aspect of the cycle of which adaptation constitutes the external aspect (Piaget, 1952, p. 7).

Wadsworth (1971, p. 10) continued:

To understand the processes of intellectual organization and adaptation as they are viewed by Piaget, four basic concepts are required. These are the concepts of schema, assimilation, accommodation, and equilibrium. These concepts are used to explain how and why mental development occurs.

Beard (1969, p. 17) referred to the concepts cited by Wadsworth as "sequences of actions" and identified the fourth sequence by naming two processes which, according to her, occur simultaneously: adaptation and internalization.

Almy et al. (1966, p. 20) referred to "maturation," "experience," "social transmission," and "equilibrium" as factors included in the transition from one stage of intellectual development to another. They also made reference to Piaget's processes of accommodation, assimilation, and equilibration or self-regulation.

The literature reviewed varied as to the specific terms used to identify the processes needed by a child in progressing through the stages of intellectual development. Wadsworth (1971, pp. 10-19) used and defined the terms in the following way:

Schema or schemata are the cognitive structures by which individuals intellectually adapt to and organize the environment (p. 10). The schemata of the adult evolve from the schemata of the child through adaptation and organization (p. 13).

Assimilation is the cognitive process by which the person integrates new perceptual matter or stimulus events into existing schemata or patterns of behavior (p. 14).

Accommodation is the creation of new schemata or the modification of old schemata (p. 16).

Equilibrium is a balance between assimilation and accommodation.

Wadsworth (1971, pp. 18-19) added "Conceptually, cognitive growth and development proceeds in this way at all levels of development, from birth through adulthood, the schemata of the adult being built from the schemata of the child."

The processes which have just been cited and defined are constantly in operation as the child passes through the popularly known stages or operations involved in the development of a child's thinking. The terms most commonly used in identifying and describing these stages were sensori-motor, preoperational, concrete operations, and formal operations. Isaacs (1972, pp. 22-24) used the term "intuitive thought" to identify the stage following the sensori-motor phase, but he did not use the term "formal operations" as a fourth stage. Singer (1972), Beard (1969), Isaacs (1972), Almy et al. (1966), Piaget (1952), Almy and Associates (1970), Biehler (1971), Weikart, Rogers, Adcock, and McClelland (1971), and Morse and Wingo (1969) all presented in some form Piaget's stages of intellectual development and were in relative agreement in their explanation of the stages and the time span over which each extends. Developmental Psychology Today (1971) included a somewhat comprehensive analysis of Piaget's theory in a discussion of perception and cognition.

Collectively, the authors cited represented the stages in the following way:

Sensori-motor--Birth to 18 months or 2 years--learning through the senses and the motor behavior

Preoperational--18 months or 2 years to 7 years--classification and intuitive thought; encounters reality on a different level; language and conceptual development emerge; his cognitions are "action" oriented

Concrete operations--7 to 11 years--ability to think out problems and apply logical thought

Formal operations--11 to 15 years--cognitive processes reach the level of comprehension and higher developmental levels

There were some discrepancies concerning the age span in the sensory motor and preoperational stages. Isaacs (1972) placed the six- and seven-year-old child at the concrete operations stage. In this study the emphasis was on the six- and seven-year-old child; therefore, the preoperational and concrete operational stages will be explored since there was such a fine line drawn between the two stages.

Cohen (1972, p. 70) reflected on Piaget's works and referred to the developmental sequences through which all children pass:

The implication of this finding for education is that certain kinds of concepts cannot be understood by children before some degree of maturing has taken place, no matter how much we try to teach them. On the other hand, the exact time at which the stages or sequences begin and end varies with individual children. It is thought that the kind and amount of experience a child has affects his maturation and accounts in some degree for an earlier or later emergence of a given stage.

The cognitive characteristics of children generally found in grades one and two will be approached from a broader concept than Piaget's stages in order to incorporate the ideas of Bruner (1960) and Cohen (1972). Children vary in their growth patterns and are often capable of accomplishing cognitive tasks which were previously thought inconceivable for them to grasp.

Biehler (1971, p. 113) recognized in children in the primary grades a "built-in motivation" and characterized them as "extremely eager to learn." Children at the 6 to 12 age are "developing concepts necessary

for everyday living" and "skills in reading, writing, and calculating" (Morse and Wingo, 1969, p. 81).

Almy and Associates (1970), Minor (1973), Rosskoph (1971), Wadsworth (1971), Beard (1969), Almy with Chittenden, and Miller (1966), Isaacs (1972), Bruner (1960), Bruner (1964), and Cohen (1972) discussed Piaget's stages of intellectual development. They varied slightly on some points in their identification and interpretation of the stages but were in general agreement.

As the child interacts with his environment, knowledge originates and takes on some organized form (Almy et al., 1966). There is a change from perceptual thought and thought that is subjectively oriented to conceptual, objective, and systematic thought (Almy and Associates, 1970).

Based on Piaget's findings, there was evidence that the assimilation of mental operations begins with actions. Children learn from involvement, not mere observance (Minor, 1973).

Developmental Psychology Today (1971, p. 269) gave Piaget's "operation" as follows:

An operation, for Piaget, is the mental action one performs in adapting to the environment. One of the major characteristics of an operation is that it is reversible: it has a logical meaningful opposite.

These operations are acquired gradually and are the substance of intellectual growth. "Intellectual growth is measured by the growing use of accommodation, the ability to alter old strategies or make new ones to solve unfamiliar problems" (Developmental Psychology Today, 1971, pp. 269-270).

In Piaget's preoperational phase the child develops the ability to imagine situations simultaneous with the time that language is developing. Through these abilities the child gains greater physical and perceptual control of his surroundings and is able to internalize events that happen in his life (Roskoph, 1971).

During most of the preoperational stage, there is an absence of the operation of conservation. The child is unable to reverse operations. Bruner (1960, p. 34), in referring to Piaget's stages of intellectual development, stated:

In this so-called preoperational stage, the principal symbolic achievement is that the child learns how to represent the external world through symbols established by simple generalization; things are represented as equivalent in terms of sharing some common property.

Bruner (1960) recognized the preoperational stage as ending around the age of five or six.

Near the end of the pre-conceptual or preoperational stage, the child can give reasons for his belief. He is able to classify objects according to size. However, there is difficulty when he has to deal with two relations, i.e., between a whole and its parts or between a class and sub-classes. It is difficult for him to make comparisons (Cohen, 1972).

Although he is able to internalize some events there are still other actions which are intuitive and perceptual. Beard (1969, p. 26) stated: "In intuitive thinking, which depends on perceptual judgments, conclusions may differ."

Bruner (1960) pointed out that teachers should expect to face some difficulty in conveying concepts to the child at the pre-conceptual

stage, even in a manner that is intuitive. When the child reaches the stage of concrete operations, his thinking is still limited to direct experience (Almy et al., 1966). As a result of his actions the child can internalize ideas related to classes and sets or sequences. He can explain classifications he has made and their relationships. At this stage of concrete operations, Beard (1969, pp. 26-27), stated:

Piaget considers that the action in reality is replaced by an action of imagination, called an operation, which may depend on imagery at least in the first place. However, operations are imagined actions which are no longer tied to physical possibilities or limited and confused by "centering" on one aspect or another.

Things at the concrete operations stage still need to be represented in some solid or visual form. The child is still limited to materials or objects or to things requiring a minimum of imagination. The most important development is that of logical operations. Logical operations are concrete operations (Beard, 1969; Wadsworth, 1971). Concepts of time, space, causality, and speed increase. The child of seven who has reached the stage of concrete operations "is superior in all respects to that of the preoperational child" (Wadsworth, 1971, p. 90) in his level of intellectual readiness or alertness.

Isaacs (1972, p. 24) stated:

Thus basic structure of their world is now properly laid down in their thought, not of course in words, but in functioning ideas. Therefore they can think out, flexibly and successfully, the simple every day space relations (distances, sizes, etc.), time-relations (intervals, successions, overlaps, etc.), or mechanical, numerical and logical relations which we all continually need.

Isaacs (1972) was referring to the child who has reached the age of seven.

At the stage of concrete operations the child "develops the ability to carry out concrete operations, that is, operations involving manipulation of physical materials." He is able to explain reasonably tasks he can see and objects he can handle (Rosskoph, 1971, p. 125; Cohen, 1972). The child can give structure to those things he meets; but he has difficulty dealing with things he has not experienced or which are not directly present (Bruner, 1960).

The stage in Bruner's hierarchy of intellectual growth which corresponds to Piaget's intuitive phase and the stage of concrete operations is the stage of iconic representation. Bruner (1964, p. 2), in an article entitled "The Course of Cognitive Growth," stated:

Iconic representation summarizes events by the selective organization of percepts and images, by the spatial, temporal, and qualitative structures of the perceptual field and their transformed images. Images "stand for" perceptual events in the close but conventionally selective way that a picture stands for the object pictured.

Bruner (1964) found that children in the five to seven years age range show no difference in the performance of tasks involving classification of materials except that the older children complete the task more quickly.

Minor (1973, p. 86) stated that "even as perception affects the meanings of words, words affect perception. . . . The word embodies a concept. The concept in turn affects perception-to-come. Mastery of words-as-concepts refines perceptions." Kennedy (1970) pointed out that we cannot assume that the child has in any degree mastered his language by the time he begins school.

Cohen (1972, p. 71) cited Piaget when referring to the degree of variability in children ages five, six, and seven:

Important to school learning is Piaget's discovery that among children between five and seven sequential development in the direction of abstract thinking occurs within a normal range, that is, some children begin at five, others at six, and most by seven, to handle abstraction.

It may be advisable to point out that "a child's age is often incorrectly used as an indicator of his stage of development." Age, however, can be used as a guide (Strauss, 1972, p. 90). The level of the child's intellectual structure helps determine the concepts he will learn and controls the limits for the interactions between the child and his environment.

The child at six and seven can remember only so much at any one time unless he sees it directly. It is important to him to find facts and learn how and why things happen. There is still a dependence on direct contact with things and people as a means of learning. As he continues to learn from people and things, he can also learn from pictures and television.

The child likes to explore and experiment; therefore, he finds it difficult to sit for a long period of time and listen to verbal explanations. The child of six and seven is ready and willing to learn (Cohen, 1972).

Beard (1969, pp. 28-29) suggested the following factors which influence the child's cognitive development:

1. Opportunities afforded by his environment
2. Individual differences in ability

3. Individuals favoring different ways of perceiving
the world
4. Affective influences

Beard (1969) emphasized that the child can regress to a previous stage of thinking at times when the materials being introduced are unfamiliar. This may occur especially in a testing environment.

Almy et al. (1966, p. 20) identified factors involved in what they referred to as transition from one stage to another. They recognized the following factors:

1. Maturation
2. Experience
3. Social transition
4. Equilibration or self-regulation--has to do with
the relationship between development and learning

Rohwer (1971) pointed out that children of the same age differ from one another in many ways. The manner in which tasks are presented will influence the child's capacity to learn.

Feldman and Crockenberg (1969) selected certain important variables which they considered necessary in charting and systematizing cognitive development in children: perception, sensori-motor development, language, conceptual activity, learning, memory, and problem solving. They presented a profile of cognitive development in an ordered sequence, beginning with birth and continuing through late adolescence and representing much research in the area of cognitive development. Feldman and Crockenberg (1969, pp. 13-14) stated: "Language development, a key indicator of symbolic activity, is featured as a major variable between

age two and age four. During middle childhood, more obvious 'cognitive' variables, such as learning, problem solving and conceptual processes, undergo development." Middle childhood encompassed the child from five to adolescence. The characteristics in the cognitive developmental profile were identified according to the authors used in the research. Piaget was used quite extensively by Feldman and Crockenberg (1969) in identifying age periods and the stages of development.

The review of literature indicated that the child of six and seven years of age is capable of developing cognitively and perceptually as he participates in various experiences. Findings also revealed that the child, under proper guidance and in the proper environment, should be able to handle successfully an instrument designed to assess cognitive learnings in a specific subject area.

Studies Emphasizing the Assessment of
Cognitive Learning in Primary Children,
Ages Six and Seven

Anastasi (1968) introduced primary testing by distinguishing between group and individual tests. She stated that individual tests are usually found in the clinical setting and group tests in the educational environment. Since this study deals with a group test of the educational type, the review of literature will be limited to primary grade tests of this nature.

Realizing the importance of developing proper skills in test-taking, especially in young children, Goolsby and Wray (1969) developed a pictorial group test for pre-primary and beginning first-grade children to provide practice for later testing experiences. The directions were

very clear and thorough, and the test contained helpful information for future test constructors.

Stewart (1970) constructed a group-administered paper-and-pencil test for kindergarten and first-grade children. The purpose of the test was to assess the children's knowledge of the contents of Arithmetic Book I, entitled "Developing Mathematical Processes." The author selected 15 behavioral objectives from Book I which could be measured by a group paper-and-pencil test. Test revisions were made as a result of comments of the individuals who reviewed the items. From the total of 171 items, seven test booklets were compiled and each was administered to approximately 40 children. The final test consisted of 35 items. A total test reliability coefficient of .91 was reported and the content validity was satisfactory.

Hines (1971) reported work related to the development of an instrument to determine the effects of Around the Bend, a television program. The purpose of the test was to supplement the standardized instruments being used to measure program performance and the cognitive learning of preschool children who viewed the program. The Appalachia Preschool Test was developed by the Appalachian Educational Laboratory. The television program was supplemented by activities of a home visitor and mobile van teachers. To measure the achievement of cognitive objectives, Part 2 was administered to 273 children in three treatment groups, and subsequently to a 60-child sample in a comparison group. Children who viewed television but did not have a home visitor or mobile van teacher scored significantly lower than those who had one or both of the variables. A three-way analysis of variance indicated that a significant treatment effect existed.

A study by Olds (1968, p. i) pertained to syntactical factors influencing children's comprehension of certain complex relationships. "It was hypothesized that development in language performance during [the six to twelve age] range was in some measure a function of a growing ability to comprehend the precise meaning of a variety of structural signals and to produce them in appropriate situations." The instrument was game-type in nature rather than a paper-and-pencil test.

"The results indicated that older children generally performed better than younger children on all utterance types and that performance on individual utterance types varied widely from one type to the next" (Olds, 1968, p. 69). The mean utterance scores were as follows: age 7--.75; age 9--.79; age 11--.91. The performance of children 11 years of age was significantly better than that of children ages nine and seven; the difference in the performance of children ages nine and seven was not significant.

A group film test was developed by Wheatley (1972) to measure certain Piagetian conservations. One purpose of the study was to determine the practicality of group testing of conservation. An effort was also made to examine the differential performance of students drawn from various populations. Wheatley (1972) cited several studies: Becker (1969) compared group and individual scores on cognitive variables in a psychological test; Brown (1967) prepared a group test of children's ability to conceptualize in a science curriculum project. The results of the two studies cited by Wheatley indicated that conservation can be assessed using group testing.

The results of Wheatley's (1972) study showed a correlation of .86 between the scores from individual and group film testing. The KR_{20} reliability for each test was above .91. Thus, group testing of conservation using a film presentation seemed practical.

Nelson (1969) investigated the role of conservation of number and length in arithmetic achievement among first-grade students. He designed a group and an individual test based on the Piagetian concepts of number and length conservation. He also used the arithmetic section of the Stanford Achievement Test. Nelson used Wheatley's (1972) number-concept test as a basis for his work. The group test yielded an internal reliability of .66; the individual test reliability was .86. An item analysis indicated that conservation concepts can be achieved through group testing.

A study by Fenley (1972) involved the development and validation of criterion-referenced tests to measure beginning reading skills. The tests constructed for this study were based on the Prereader and Book One of McGraw-Hill Programmed Reading. Behavioral objectives were formulated and test items constructed accordingly. The tests were developed for and administered to kindergarten and first-grade children.

The reliability of Prereader Form A was .97; Prereader Form B, .97; Book One--Form A, .98; and Book One--Form B, .97. All but two children achieved mastery on Form B and all but one achieved mastery on Form A of the Prereader Test; all children achieved mastery on Book One tests. There was a high correlation between the alternate forms of the Book One tests.

The purpose of a study by McSpadden (1972) was to devise a diagnostic instrument for measuring listening ability of children in grades one, two, and three. The content validity and the reliability for the instrument were established; the relationship between listening and the variables of intelligence, reading achievement, and the achievement of school related skills was also evaluated. "Significant correlations were found between the listening test and measures of intelligence, reading achievement, and the achievement of school-related skills" (McSpadden, 1972, p. iv). An analysis of variance of scores was significant at the .01 level; the odd-even reliability coefficients were significant at the .01 level.

Wallner's (1971) study involved the development of a pictorial paper-and-pencil test of listening comprehension designed for kindergarten and beginning first-grade children. Reliability and validity of the test were established. The reliability for Form A and Form B was .95. The content validity of the test was supported by the judges.

An objective paper-and-pencil test based on a number of the behaviors outlined in Bloom's Taxonomy of Educational Objectives: Cognitive Domain was developed by Klein (1965). The age range was seven through nine. It was also an intent of the study to determine whether the instrument could be administered successfully to children ages seven through nine so that a range of performance could be elicited and detected. Validity and reliability were determined and two hypotheses were tested. It was concluded that a paper-and-pencil test which would measure all the behaviors defined in Bloom's Taxonomy of

Educational Objectives could be developed for seven-, eight-, and nine-year-old children. The test received the same rankings from the three judges at 16 of 21 levels of behavior. Two of three judges agreed in four categories; one category had to be eliminated because of lack of agreement. The index of discrimination of 83.7 per cent of the items met the desired criterion. It was also concluded that a range of performance in each behavior could be evidenced.

The compilation of test items to assess the learnings derived from education based on measurable social studies objectives was the focus of a study by Henson (1963). The study involved grades one to four. Curricular and statistical validity were determined; the reliability of the test was also a concern of the study. The test yielded a reliability of .91 using the split-halves reliability coefficient method. The conclusion was that the reliability and validity were acceptable.

An investigation by Shah (1969) had for its purpose the analysis of the items in the COPES Test of Science Concepts and the COPES Test of Critical Terms. Also, an attempt was made to determine the criterion-related validity of the test. There were other dimensions of the study. The subjects were children in grades two, three, five, and six. Five hypotheses were tested and supported. The results of the tests indicated high content validity. The reliability was investigated during the pilot phase of the study. The Pearson Product-Moment Correlation Coefficients of each test and the criteria were significant at the .05 level. Twenty-seven of a total of 46 items in the COPES Test

of Critical Terms discriminated at the .05 or .01 level of significance for the second grade.

There are several types of standardized paper-and-pencil instruments available for use at the early childhood and primary levels. The First Grade Screening Test (Pate and Webb, 1966) was developed for the purpose of identifying children who would probably not make sufficient progress during first grade to be ready for second grade the following year.

Boehm (1969) devised the Boehm Test of Basic Concepts--a pictorial test to be administered in groups. The 50 items were organized into two booklets of 25 items each.

The California Short-Form Test of Mental Maturity was devised by Sullivan, Clark and Tiegs (1963). Level 0 and Level 1 were intended for use with first- and second-grade pupils, respectively. Tiegs and Clark (1963) also constructed a California Achievement Test for lower primary level, Grades one and two.

In order to test readiness skills in kindergarten and grade one, Gates and MacGinitie (1968) prepared a test called Readiness Skills, one of a series of Gates-MacGinitie Reading Tests. The eight subtests assess the areas of Listening Comprehension, Auditory Discrimination, Visual Discrimination, Following Directions, Letter Recognition, Visual-Motor Coordination, Auditory Blending, and Word Recognition. The test is in pictorial form and is group administered.

Lee and Clark (1962) revised an earlier Reading Readiness Test for kindergarten and grade one. It is pictorial in form and is to be administered to groups. Metropolitan Readiness Tests were constructed

by Hildreth, Griffiths, and McGauvran (1969) to be administered whenever children are ready to follow group directions and handle a paper-and-pencil test, usually at the end of kindergarten or early in the first grade.

The Murphy-Durrell Reading Readiness Analysis (1965) is made up of three subtests: Phonemes Test, Letter Names Test, and Learning Rate Test. These tests are used to predict reading achievement at the end of the school year.

Primary I, II, and Elementary I Levels of the Otis-Lennon Mental Ability Test may be used during the last half of kindergarten through grade three. The purpose of the test is to measure ranges of ability in grades one through twelve. There are other levels of tests to cover the upper grade range.

Thurstone and Thurstone (1963) were the authors of the Primary Mental Abilities test for grades kindergarten and one. The tests purport to measure intelligence in the areas of verbal meaning, number facility, reasoning, perceptual speed, and spatial relations.

The Stanford Achievement Test, Primary I Battery, was designed for use from the middle of grade one to the middle of grade two. The test is used to provide an objective measure of the achievement level of each pupil in each subject as a basis for planning individualized instruction (Kelley, Madden, Gardner, and Rudman, 1964).

The Cooperative Primary Tests measure basic verbal and quantitative understandings in grades one through three. The complete battery provides separate measures of four important verbal skills and concepts necessary for elementary mathematics. Pictures are used (ETS, 1965).

An instrument appropriate for assessment and instruction is entitled Let's Look at Children (1965). It was designed for the purpose of understanding, assessing, and fostering the intellectual development of young children. It consists of a flexible package of materials to be used in a variety of ways.

A number of these readiness, intelligence, mental ability, concept, and screening tests were used to assist the researcher in constructing the instrument for this study.

No studies were located which dealt with the assessing of cognitive learning in physical education at the primary level. The AAHPER Cooperative Physical Education Tests, however, are designed to measure understanding of the knowledge in the area of physical education. There are two forms of the test to be used at grades four through six. No tests were available for grades below grade four. The tests are based on the body of knowledge contained in a manual published by the American Association for Health, Physical Education, and Recreation and are available through Educational Testing Service (1970).

The absence of instruments for assessing cognitive learning in physical education was quite conspicuous. A number of standardized screening, achievement, readiness, and mental ability tests were available. Various studies were located which involved the construction of group-administered paper-and-pencil tests for assessing cognitive skills and knowledges. The tests and studies identified in the review of literature served as helpful models for the construction of the instrument in this study.

Physical Education for the Elementary School Child

Approach to Physical Education Through
Movement Education in Elementary
School Programs from 1956-1976

Background Information on Movement Education. The major emphasis of this section of the review of literature will deal with the development of movement education from 1956-1976. It seems necessary, however, to reflect on some events which earlier influenced the present trend toward movement as a basis for elementary school physical education programs.

In 1925, H'Doubler emphasized the importance of developing a body that is responsive with a maximum degree of flexibility in every part. The body must function under control. H'Doubler (1925, p. 57) stated: "Obviously, such an undertaking demands a technique that will adequately develop and coordinate in a harmonious functioning not only all parts of the body, but to no small extent, all parts of the body and the mind as well." The development of a technique which leads to the harmonious functioning must be based upon an understanding of the mechanics of movement. Best performance results from movements that are natural because artificial movements that are often achieved through imitation are of little value to the student (H'Doubler, 1925).

Some years later H'Doubler (1946, p. 1) stated:

Considering the goal of all education as the building of integrated personality through self-realization, the most significant contribution physical education has to offer to the achievement of this goal is to create within students a desire for good body movement--good in the sense that it is true to the body structure and its laws.

According to H'Doubler (1946), it is important that physical education should contribute to a balanced education which involves the whole self. Experiences which provide the opportunity for motor activity must be a part of the total educational experience which fosters the creative energy.

H'Doubler (1946, p. 2) commented:

The problem of movement education, therefore, has two main considerations: one, to educate the mind to be aware of conditions of the body in action and to be able to organize and direct its energies into effective behaviour; the other to train the body to become a strong, flexible, and well coordinated instrument to the end that it may be responsive and efficient in executing those acts that manifest individual choice.

It should be noted that as early as 1946 H'Doubler began to incorporate the term "movement education" into her writings. H'Doubler (1946, p. 2) continued by stating:

All teaching effort should be directed toward helping the individual to gain an intelligent mastery of his body and developing this mastery as far as his capabilities permit for efficient and enjoyable activity.

H'Doubler (1959, p. xxiii) wrote of discovering movement, degrees of speed and force, and "the changing spatial relationship between the moving body parts, and between the body and other objects in space." To emphasize the importance of being educated in the area of movement, H'Doubler again referred to movement education as follows:

Unfortunately, because of the lack of movement education, the average person is kinesthetically unaware of movement as a source of self-awareness and well-being; therefore movement cannot play its important role in the life of the individual. . . . Movement experiences need to be presented in such a way that the student will be able to summon and integrate his intellectual, emotional, and physical responses, and in this way be able to identify himself with his own movement experiences (H'Doubler, 1959, p. xxiii).

H'Doubler, whose emphasis was in the area of dance, was writing generally about the need for efficient, effective movement. The concept of movement education applied to all individuals and was not intended as a program for elementary school children. Her ideas reflected those of Rudolf Laban, whose extensive study of body movement in Germany has led to a new look at physical education programs for children.

Halsey and Porter (1963) made reference to a workshop conducted by H'Doubler in 1926. The focus of the workshop was "Fundamentals of Movement" relating to dance, sports, and other activities (Sweeney, 1970). From the records of the uses of the terms movement education, movement exploration, fundamental movement, and other similar terms, it is evident that the concept has a long history. Ludwig (1968) recognized H'Doubler's early use of the theories of basic movement education in educational dance and also as a foundation for all physical education.

Gates (1968, p. 42) alluded to the diversity of ways the term movement education had been used. Gates, however, associated the broad use of the term with the "core of all the activities with which we as teachers are concerned." She referred to the sensory experiences of movement and related them to the true nature of the child.

Gates (1968), Brown and Sommer (1969), Gaumer (1962a), Gaumer (1962b), and others all referred to Laban's works in their discussions of movement. Movement is of two kinds, functional and expressive. There are certain components that are common to all movement, namely, effort--which is made up of the elements of time, space, weight and flow--and shape. There are, however, various interpretations of Laban's movement theories.

Movement education programs based on Laban's theory of movement are considered to have originated in England. The thrust of the program came in 1952 when the Ministry of Education published Moving and Growing and Planning the Programme (Tillotson, 1965). The publications were geared for teachers of elementary school children. There is no question that the works of Laban and Lawrence (1947), Laban (1963), Redfern (1965), Cope (1967), Morison (1956), North (1959), Russell (1965), Mauldon and Redfern (1969), Morison (1969), Mauldon and Layson (1965), Bilbrough and Jones (1963), Stanley (1969), and others have influenced the incorporation of the movement education concept based on Laban's scheme into elementary school programs in the United States.

Halsey (1955) reported having visited elementary schools and teachers' colleges in England in the fall of 1954. During her visit she conferred with many outstanding leaders in physical education and observed children in a number of schools. She was impressed with the approach to teaching "movement" in the areas of dance, games, and gymnastics. Children, working alone or in groups, invented their movements. The teacher made suggestions and encouraged the children to improve the quality of their movements.

Halsey (1955, pp. 34 and 39) identified six objectives of the physical education program for the children in the English schools:

"Free enterprise" encouraged children to explore and invent what they can do on the apparatus. "Individualized experience[s]" allowed for individual differences by permitting the children to progress at their own rate. Throughout the class period children kept active which provided for "vigorous physical activity." "Skill" was developed through the use of progression in the presentation of tasks. There was a "unified development of the child through integrated experience[s]"; this involved an integration of self and of the activities within a school day. The experience resulted in "recreation" because children are eager and happy in the activity.

Personal satisfaction and professional growth were outcomes of the visit to England. Halsey (1955, p. 39) stated: "It seems very obvious that we gain a great deal by exchange of ideas and experiences." There was, however, a more obvious outgrowth of the experience. It was during Halsey's (1955) visit that plans were initiated for organizing an Anglo-American Workshop on Elementary School Physical Education in England. These plans were implemented in 1956.

Movement Education in the United States Since 1956. Barrett (1969) stated that the term movement education has been used by physical educators for many years but with renewed emphasis since 1956. She defined movement education as "the total contribution to a child's development through movement experiences" (Barrett, 1969a, p. 60). In a paper entitled "I Wish I Could Fly--A Philosophy in Motion," Barrett (1973a) pointed out that she avoided the term movement education and similarly used terms because of the confusion they have caused. In a later article by Tanner and Barrett (1975), movement education and physical education were seen as being synonymous. They stated that "physical education is in essence a child's education in and through movement" (Tanner and Barrett, 1975, p. 20).

The renewed emphasis in 1956 was the result of the first Anglo-American Workshop on Movement Education (Howard, 1966). It was held in England in the summer of 1956 and was attended by American physical educators interested in elementary school physical education. Those in attendance had an opportunity to become familiar with the movement education programs as they were being implemented in England. The

workshop provided an impetus for a new attitude toward and an improvement in elementary physical education programs in the United States (Howard, 1966; Barrett, 1969b). Hussey and Murray (1956), in an article entitled "Anglo-American Workshop in Elementary Physical Education," gave a report of the workshop. Included in the article were excerpts from the reactions of some of the American participants. The following reaction by Elizabeth Ludwig was cited:

Participants in the Workshop undoubtedly reacted to the various experiences in different ways, but there is little doubt that here was an ideal situation for a fresh approach to an evaluation of one's own philosophy and program of physical education, uncomplicated by pressures and urgencies. The only urgency was to observe, to question, to think--an exciting experience and genuinely rewarding to everyone.

Also, in 1956, several members of the National Association for Physical Education of College Women were participants in a group on movement. They compiled a list of movement related terms and their definitions. Their work was the outgrowth of a concern about the definition of terms derived by a study group at the 1956 National Association for Physical Education of College Women's summer workshop. Two of the terms and their definitions which represented agreement among participants of both groups were as follows:

Basic Movement: Unstructured movement carried on for its own sake and for increased understanding and awareness of the movement possibilities available to the human body. (This involves emphasis on the actions of body joints and their relation to time, force, and space.).

Movement Education: Provided experiences through which an individual develops understandings of, appreciation for, and skill in, human movement (NAPECW, 1964, p. 145).

Ten years later the Second Anglo-American Workshop on Movement Education was held in the English Speaking Union, London. It was held

in order to show the development of movement education in England. During the intervening ten years, adaptations of British concepts of movement education became more and more prevalent in the professional materials, and they were more widely used in the elementary school programs (Howard, 1966).

Since 1966 a number of workshops, conferences, clinics, and institutes have been scheduled all over the country in an effort to implement the ideas gleaned from the two Anglo-American workshops. In one of these conferences, whose participants were primarily college teachers who were preparing elementary classroom teachers, Robert Fleming said:

It is a time for pruning. Pruning is a positive spring-like word. It is not destructive, for it gives shape, it strengthens, it utilizes, and it gives direction. The watered down or adjusted program is not what the student needs. . . . We must revise our perceptions of the program and cut our reference to "baby games" and "kiddie courses." We need to utilize new information about teaching. . . . How can children be helped unless we confront them with needed concepts, ideas, activities, experiences. . . ? (AAHPER, 1967, pp. 12-14).

Two other events that have given impetus to the "movement movement" were the creation by AAHPER of an Elementary School Commission in 1964 and the appointment of a full-time elementary education consultant in 1965. In an article entitled "Elementary School Physical Education Today," Hanson (1969), the newly appointed consultant, discussed promising practices, trends, and new terminology in elementary education and elementary physical education. The terms most frequently used when referring to the current trend in elementary physical education were basic movement, movement exploration, and movement education. She

recognized the confusion in the use and lack of understanding of the terms. She defined basic movement as "the proper term to use in identifying the foundational content which includes a focus on the elements of movement--space, time, force, and flow." She defined movement exploration as "a first creative step when using the problem-solving method." Movement education was defined as "a broader term, which is being used to describe elementary school physical education when it includes the basic movement content and uses movement exploration as part of the method" (Hanson, 1969, p. 3).

In 1965, This Is Physical Education, a statement prepared by the Physical Education Division of the American Association for Health, Physical Education, and Recreation, was published. Reference was made to the new "complex subject called physical education," accompanied by the statement: "The new content is a sequence of experiences in which children learn to move as they move to learn more about themselves and their world" (AAHPER, 1965, p. 3). Two of the five purposes of the experiences were as follows:

To HELP children learn to move skillfully and effectively not only in exercise, games, sports, and dances but also in all active life situations.

To ENRICH understanding of space, time, mass-energy relationships, and related concepts (AAHPER, 1965, p. 3).

The ideas reflected in the proposed curriculum for the four-to-eight age group encouraged exploration which resulted in the child's making discoveries about himself and the world around him. Exploration was to be "directed toward the solution of specific problems" (1965, p. 10), but reference was made to structured organizational

patterns, i.e., lines and circles. The report concluded:

In physical education . . . children are now dealing with the concepts, symbols, and skills of movement experienced in ways that could not have been foreseen a generation ago. Today's physical education is the subject in which children learn to move as they move to learn (AAHPER, 1965, p. 24).

As the result of the several conferences, conference reports, and other efforts to bring about changes in physical education programs, the literature revealed many and varied interpretations of the proposed ideas. Definitions of terms such as movement education, basic movement, and movement exploration brought about confusion and misunderstanding and began to be used in different ways. Other terms began to emerge, i.e. motor exploration, educational gymnastics. Often all of these terms were used interchangeably and synonymously.

Authors using the umbrella term movement education were Andrews, Saurborn and Schneider (1960), Bucher and Reade (1971), Dauer (1972), and Dauer and Pangrazi (1975). Kirchner (1974) and Kirchner, Cunningham, and Warrell (1970) employed the term movement education and related it specifically to the area of gymnastics. Those using movement exploration as the broad term were Anderson, Elliott, and LaBerge (1972), Halsey and Porter (1963), Miller, Cheffers and Whitcomb (1974), and Vannier, Foster, and Gallahue (1973). Fait (1976) chose motor exploration or movement education as his terms but referred to motor exploration more often. Schurr (1967) explained movement education as an approach used in teaching basic skills with exploration as the method. Movement education, or a similar term, was interpreted by most of the authors as a unit in physical education generally used at the primary level.

It should be recognized that an effort was being made by writers to understand and incorporate the movement concept into their texts and materials. There were, however, those in physical education who expressed doubt and even opposition to the philosophy associated with movement education. Locke (1970) presented the strengths and problems of movement education as he saw them. He stated that movement education might have some significance in the lower grades for retarded children or for children with other types of problems. He then added that "beyond these points I am unconvinced that movement education will bring the millennium in physical education" (Locke, 1970, p. 199). Siedentop (1972) discussed the concept of human movement and cited Laban's theory as its basis. He then tried to predict the future of movement education and conjectured that it probably would not last; he stated: "As you can tell, I am not exactly a proponent of the concept of human movement" (Siedentop, 1972, p. 125).

On the other hand, a number of authors supported the concept of movement education as physical education. They recognized human movement as the important content of physical education programs. Howard (1967) perceived movement education, an outgrowth of English education programs, as the typical approach found in elementary schools throughout the United States.

Movement education is physical education, the content of which is human movement or forms of human movement (Carroll and Lofthouse, 1969; Frostig and Maslow, 1970; Tillotson, 1965; Andrews, Saurborn and Schneider, 1960). The concepts of movement education are based on the

philosophy and principles of movement of Rudolf Laban (Stanley, 1969; Thornton, 1971; Schurr, 1970; Halsey and Porter, 1970; Howard, 1967). The program is centered around four components of movement: body awareness (what moves), space awareness (where the body moves), the effort quality of movement (how the body moves), and with what relationships. Each component has several subdivisions or elements. Under the body awareness component are found body functions involving the whole body, body parts, weight bearing, body actions, and shapes--either symmetrical or asymmetrical; space awareness involves general and personal space, directions, levels, pathways, and extensions in space; the effort quality implies weight (firm or heavy and fine touch), time (sudden and sustained), space (direct and flexible), and flow (bound and free); relationships involve objects which are manipulative or non-manipulative, and people--either alone, alone in a mass, with a partner or in small or large groups (Stanley, 1969; Barrett, 1973b; Thornton, 1971). Barrett (1973a, p. 7) stated: "It is from this structure that the content of physical education emerges and develops." The components and elements run throughout and can be applied to all movement forms. Barrett (1973a, pp. 7-8) continued by stating:

The program is divided into three specific forms of movement: dance, gymnastics and games/sports. In dance, the major emphasis for all children is educational dance and folk dance; in gymnastics, the major emphasis for all children is educational gymnastics . . .; in games/sports, the major emphasis for the younger children is on the development of manipulative abilities and child designed games, and for the older children continued development of these emphases with additional work on pre-structured games.

These forms, according to Barrett (1973a), make up the curricular level of organization in the physical education program.

Each of the curricular levels of organization was stressed and developed by a number of writers. Gates (1968), Russell (1965), Hussey (1969), Murray (1963), and Joyce (1973) emphasized especially the importance of expressive movement, which is developed in the dance area or form of movement. Mauldon and Redfern (1969) prepared an approach to teaching games. Mauldon and Layson (1965) and Morison (1969) stressed the gymnastics form. Each of these authors based the development of her respective curricular areas on Laban's scheme and further identified content items specific to each area. The movements used in the games/sports and gymnastics areas were consistently identified as functional movements, movements used in body management and mastery. Bilbrough and Jones (1963) and Stanley (1969) developed the three forms of movement.

A physical education program based on the philosophy of movement education is implemented in a manner which is consistent with the goals of education. It implies a methodology or teaching process which permits individualization and decision-making on the part of the child.

Terms which were consistently used to describe the method used in movement education were "problem-solving," "movement exploration," "guided discovery," and similar terms which permit the child to find the solution to the task or problem presented by the teacher. Such a decision-making process encourages the child more nearly to attain the goals of education and physical education which Barrett (1973a) saw as being interrelated.

Barrett (1973a) cited Ammons (1969) and Gordon (1971) in identifying five goals of education which helped her "define the direction of physical education for the elementary school child":

1. A child should have skill in decision-making.
2. A child should be able to take responsibility for his own learning and he should become increasingly an independent learner.
3. A child should value learning as a means for coping with his world.
4. A child should be competent.
5. A child should have a sense of self-worth (Barrett, 1973a, p. 5).

Barrett (1973a, p. 4) recognized "education and physical education as TOTALLY interrelated." She cited three mutually dependent goals of physical education. The goals were as follows:

1. A child should move skillfully, demonstrating versatility and dexterity in his ability to move.
2. A child should be aware of the meaning and significance that movement may hold for him.
3. A child should have knowledge about the principles which govern skillful movement (Barrett, 1973a, pp. 5-6).

In a later publication entitled "Movement Education: What Does It Mean?" Tanner and Barrett (1975, p. 20) stated:

It is the hope . . . that the view of movement education in its most global sense will eventually be generally adopted. This would then also infer the synonymy of movement education and physical education within the school setting, or formal education framework. This would eliminate the use of the term movement education as applying only to fundamental movement experiences for the primary grades, particularly those identified as units of content.

The program used as a basis for this study was developed around the concepts incorporated into movement education. The experiences designed for the child developed the content based on Laban's theory of movement and employed a method which encourages decision-making on the part of the child.

In summary, it was quite evident that the concepts of human movement and movement education have long histories. Many authors, however, considered the terms as descriptive of relatively new approaches to elementary school physical education. The early contributions of Margaret H'Doubler should help dispel the idea of the newness of the movement concept. More recently the movement education concept has come into the elementary schools and is having a definite influence on the school's physical education programs. The thrust was inspired by observations of children in the schools of England as well as the availability of English textbooks on the subject of movement education. The content of movement education programs is based on Rudolf Laban's movement theory, and the method used is principally problem-solving.

Television Instruction

General Programs--Primary Level

Instruction through the use of television has increased in the past years. Programs are available in practically all subject areas and at all levels of instruction. The use of instructional television, however, is more prevalent in subject areas other than physical education.

A review of the literature revealed an extensive amount of research and information concerning Sesame Street. In a brief article in the Newsline section of Psychology Today (1973, p. 14), the following statement appeared:

Sesame Street is the most thoroughly researched TV program in history, studied before it went on the air and since. Its success in achieving its basic goal, improving reading, arithmetic and other basic cognitive skills in young children, has been well documented (Horn, 1973, p. 14).

Lesser (1972) stated that Sesame Street was intended to be supplementary to but not to replace or compete with other educational experiences. The purpose of the program is to try to prepare children for school and to encourage them to want to learn. The comment was made in the Teachers' Resource Book for School Television (1972-1973, p. 7): "Sesame Street, the series that revolutionized television's role in education, provides a unique format and form of early education for pre-schoolers. Some teachers may also use it as a supplement in the primary grades."

Other instructional or educational courses and programs are offered through various television networks and/or centers. The National Instructional Television Center is probably the largest producer of educational programs. A number of the courses are designed for the primary level in the various curriculum areas.

Primary Art was written by Misako Nagashima (1969) for the purpose of introducing children to the method and meaning of art. It considers various artistic concepts and strives to encourage self-expression.

Mary Lou Ray (1972) wrote Words Are for Reading. The program helps develop language skills through the presentation of words appearing in scenes which are appealing to children.

Ripples does not deal with a specific subject matter area. It takes a new approach with children five to seven years of age. Ripples provides experiences geared toward the development of values, feelings, and other affective aspects of the child's life (National Instructional Television, 1970d).

Science and health are approached through a program entitled All About You (NIT, 1964). It deals with the mind and body in the areas of

understanding how children grow and develop; it also stresses the necessity for good health. One lesson focuses on the importance of playing daily; in addition, it emphasizes good posture.

How Can I Tell You consists of language arts programs for grades one through six. The intent is to stimulate children to express their thoughts and feelings in a variety of ways; various methods of communicating feelings are identified (NIT, 1970b).

Children are encouraged to express ideas and emotions and to develop dramatic skills in a creative way through participation in Imagine That. Activities involve pantomime and other forms of creative expression (NIT, 1968).

Tell Me a Story was designed for primary grades but appeals to a much wider audience. The program features stories from folklore, from classic story-tellers, and from the world. It should enhance the child's vocabulary and instill a feeling for logic (NCSCCT, 1966).

The course Patterns in Arithmetic was designed as a complete program in elementary arithmetic. It consists of six levels for grades one through six (NIT, 1970c).

Children act out songs, beat out rhythms on various instruments, make up words and music, and participate in singing games when they become involved in Stepping into Melody (NCSCCT, 1968). Stepping into Melody is a continuation of Stepping into Rhythm.

Kotila (1970) wrote Explorers Unlimited Teachers' Guide. The course includes visual field trips to places the children probably could not go otherwise. The trips include visits to a skyscraper, a salt mine, a fish hatchery, a large hospital, and other places where the camera can go.

Field trips of another type are taken as the children participate in Other Families, Other Friends, written by Ruth Kotila (1971). The field trips via television focus on people, where and how they live in other parts of the world.

Granny is a music enrichment series designed for the purposes of broadening a child's understanding of music and encouraging musical activity in the classroom and school. The Granny Series is produced by Station WTVI and by the Charlotte-Mecklenburg Schools. It is broadcast by the University of North Carolina Network in conjunction with the State Department of Public Instruction (1972-1973).

The University of North Carolina Television Network produced an elementary science course, Exploring the World of Science, for grades one through three. It is designed to encourage the child to explore the unknown and to develop an awareness of the world around him.

The University of North Carolina Television Network also carried a cognitive training program, Let's Learn to Think, and a social studies course, Stories to Talk About. In addition, a number of the National Instructional Television programs previously described were broadcast by the University of North Carolina Television Network.

Only one of the television programs which have been described included any form of test. Patterns in Arithmetic contained check-up exercises throughout the program (1970, pp. 55-59; 136-142; 199-203; 265-269). The exercises were televised, and copies of the paper-and-pencil tests were included in the children's workbook and the teacher's manual.

Elementary Physical Education Programs--Primary Level

An extensive search of the literature revealed little evidence of the availability of television programs in the area of physical education. Few, if any, studies had pursued the idea of physical education via television.

From 1962 to 1965, National Instructional Television made an analysis of school television activity across the United States. The purpose was to attempt to meet some of the needs of elementary physical education through the medium of television. The major thrust of the commitment to television was use at a local level; only one physical education series was recognized as suitable for widespread use by the producer. Educators and broadcasters, however, rejected the series (NIT, 1970).

During 1965-1966, the National Center for School and College Television held two conferences to assess television materials in health and physical education being offered in schools and colleges. Questionnaires were sent to all educational television stations, state networks, and closed circuit facilities in the United States. The results revealed that 33 of 55 telecourses were designed for elementary grades--16 were for the primary level, 16 were for the intermediate level, and one was for kindergarten through the sixth grade. All telecourses were offered for a full year or for a semester. The majority of the telecourses were offered at least once a week and some twice a week; one offered monthly lessons and another offered two lessons each month.

Participants at the conferences viewed, analyzed, and discussed existing programs. They found that there were more programs in existence than had been anticipated. Each had been developed locally with a minimum exchange among groups. Most programs were designed to cover several grade levels and to fit the school's organizational pattern. None was designed for the ungraded school pattern.

The result of the investigation and analysis of the findings by the National Center for School and College Television prompted the National Instructional Television, in 1966, to investigate further the use of television to strengthen instruction in physical education. An attempt was made to introduce new concepts into programs and to incorporate them into actual classroom practice. There was also a necessity for training teachers and specialists. It was the hope that television would expedite the needed reform.

The study of existing television materials revealed that traditional concepts of method and content were being perpetuated. There was no opportunity for exploration or discovery. Yet, the specialists felt that well designed television materials could meet the existing curriculum needs by supplying a classroom resource and by aiding professional development. The resource could also fill the gap between new concepts and actual practice in the classroom.

Although the programs studied were better than many of the existing traditional physical education programs in the schools, they still used the same methods and content. The television medium was not being used to full advantage; lessons were predominantly talk; various items detracted from the materials presented; and the programs attempted to serve diverse purposes.

The conference report included a list of programs in existence at the time of the investigation. The programs related to physical education are presented in Table 1.

In a series of articles in the Journal of Health, Physical Education, and Recreation, Bardsley (1965) reported on the use of closed circuit television in the various subject areas (including physical education) in the Chelmsford, Massachusetts, school system. Two complete physical education programs were telecast in the classroom each day in addition to the regular supervised 30-minute weekly period of physical education. Topics were adapted to grades one through three and four through six; posture was emphasized.

Atlanta, Georgia, and Fulton County Educational Television produced and broadcast locally Health n' Fitness, an elementary physical education program for kindergarten and grade one, and a series by the same title for grades two and three. Each series consisted of 38 lessons which began in August and continued throughout the entire school year until June. The lessons were aired twice a week and were 15 minutes in length. Generally, the first lesson in the week concerned a health topic and the second lesson related to physical education. Intermittently, there was only one lesson per week. Programs were also available for grades four and five and grades six and seven. A teacher's manual was available for each series.

A further review of the literature revealed a minimal use of television in the area of physical education. The higher the educational level, the less frequent was the use of television in teaching physical education.

TABLE 1

Television Programs in Physical Education--Primary Level

Telecourse Title	Location	Number of Lessons	Lesson Length	Broadcast Frequency
Focus on Fitness	Seattle, Washington	15	15-minute lessons	1/week
Fun and Fitness	Louisville, Kentucky	15	15-minute lessons	2/month
Growth Through Play K-3	Logan, Utah	12	10-minute lessons	2/week
Heads Up 2-3	San Francisco, California	14	15-minute lessons	1/week
Physical Education 1-2	Oklahoma ETV Commission	35	15-minute lessons	1/week
Physical Education 1-2	Columbus, Ohio	36	15-minute lessons	1/week
Physical Education 1-2	Tacoma, Washington	27	15-minute lessons	1/week
Physical Education For You 1	Milwaukee Public Schools	30	15-minute lessons	1/week
Physical Education For You 2	Milwaukee Public Schools	30	15-minute lessons	1/week
Primary Physical Education	San Jose, California	30	10-minute lessons	1/week

Note. Taken from National Center for School and College Television News Supplement No. 4, p. 10 (no date)

"Ready? Set... Go!"

In late 1966, a task force was established by National Instructional Television to develop objectives for use in a physical education television program and guidelines for accomplishing the objectives. The task force decided that television should be the medium used to introduce needed reform in curriculum and to stress the importance of physical education for elementary school children. The necessary materials would accompany the television program.

Physical education specialists studied existing programs and newer curriculum concepts. It was decided that the basic movement concept would serve as the core of the program; the methodology should complement and be consistent with the newer curriculum concepts.

National Instructional Television secured the services of two physical education specialists in elementary school physical education to select and organize the content. The content designers were Dr. Bette J. Logsdon, Bowling Green State University, and Dr. Kate R. Barrett, University of North Carolina at Greensboro. The appropriate television teacher was selected. She was Mrs. Jane Young, a native of England, from the University of South Florida.

There was an experimental production and a provisional production in late 1968 and early 1969, respectively. Following these productions, a teacher's manual and a series of lessons for Level One were made available across the country in the fall of 1969. Level Two was completed in time for use the following school year.

"Ready? Set... Go!" is a television series in elementary physical education designed for primary grades. Level One was designed especially for grades one and two and consisted of 30, 20-minute lessons and accompanying teacher orientation tapes. The report stated:

It is an approach to teaching physical education that deals with the introduction of basic body movement to the elementary student. The main emphasis is directed to giving the child an understanding of the concepts of basic movement, of making movement relevant to his total educational development (NIT, 1970a, p. viii).

Constant feedback by users of the program in the form of evaluation and rating scales revealed definite satisfaction and acceptance of the "Ready? Set... Go!" Series. The reports stated: "'Ready? Set... Go!' is effective television and when combined with support materials and follow-up activities, results in a highly valued program of physical education" (National Instructional Television, 1970a, p. 44).

Since the production of "Ready? Set... Go!" in 1969, there have been approximately 36 users of the program. These users represented the educational television networks in approximately 25 states in the United States. The number of users has decreased consistently. There were 24 users identified in 1970-1971, 12 in 1972-1973, 10 in 1973-1974, eight in 1974-1975 and four in 1975-1976.

Studies Related to the Effectiveness of Television Instruction

Findings based on studies have varied as to how receptive individuals have been concerning instructional television and its effectiveness.

Schramm (1962) expressed confidence in the conclusion that students learn effectively from instructional television. His findings indicated

that success had been experienced in the use of television instruction in practically every subject area. He concluded that television instruction was more effective for the average student than for the below average student. He also found that the average student learned equally as well in a television class as he did from the traditional classroom method. Even though some students learned more and some learned less, it was concluded that there was no significant difference in the degree of learning in a television class and in a traditional classroom environment.

In a table summarizing the results of 393 studies comparing the effectiveness of conventional classroom teaching and instructional television, no physical education studies were reported. Health and safety were represented (Schramm, 1962). Schramm (1962) reported that greater success had been experienced in grades three through nine than in high school and college. Grades below three were not included in the study.

Another study involved a comparison of the amount of progress made by students who had experienced conventional classroom teaching and those whose approach was instructional television. Schramm (1962) reported that elementary teachers in one locale identified physical education as one of the "most-wanted resources" (Schramm, 1962, p. 65).

In a more recent study, Hilliard (1966) concluded that educational television programs for children had been inadequate and had contributed little to the educational goals of children. He recognized the impact that television had on children and felt that an effort should be made to meet educational needs through the use of television.

Hilliard (1966, p. 11) stated:

Our responsibility is . . . to clearly recognize that the medium is the message, that the conveyer is the content in that the media in and of themselves have a profound effect on emotional, thought and behavior patterns, and that we must accordingly design and utilize the media with that in mind, making them and their use optimum in terms of our purposes of education.

Lesser (1972, p. 233) cautioned that "television must never be designed to replace or compete with other educational experiences. It can only aspire to complement whatever else the child has available."

Several questions were posed by Lesser (1972, p. 242). One with a comment, is as follows:

Will the visual representations of television foster corresponding mental representations in the child? It seems overly simplified to expect such direct effects upon a child's thinking, but given the importance assigned to the development of mental representations (or Piaget's "schemata"), it probably is worth finding out how the visual and mental representations connect.

The producers of educational television programs and researchers using television to explore how children learn have experienced many surprises and mysteries. They continue, however, to promote and encourage the use of the visual medium to learn about children and to help children learn (Lesser, 1972).

A report published by the Television Teaching Laboratory (1965) cited some advantages and limitations of television instruction. One advantage was that the "eye contact" involved in television teaching gives the student the feeling that the teacher is speaking directly to him. The instructor comes through as seeming more enthusiastic and sincere, qualities which are contagious and which increase motivation.

The standardization of instruction made it possible for evaluation to be more valid than before. Limitations cited were lack of feedback and the inability of the teacher to judge the reaction of the students during the lesson.

The report discussed the laws of learning and related them to television instruction in several ways. One such law was that children learn best when they are involved in the learning process through action and participation; and, "when purposeful activity is associated with learning, it makes the learning more permanent" (Television Teaching Laboratory, 1965, p. 8).

The report further recognized that "few studies . . . have dealt with the best way of evaluating student learning gained through TV instruction. Even less attention has been given to the use of TV for measuring student achievement" (Television Teaching Laboratory, 1965, p. 55).

Tests used to evaluate television teaching are generally teacher-made. Teacher-made tests should be designed to measure the extent to which the student has achieved the objectives of the course at the level specified. Tests which are intended to evaluate student achievement should be the best that can be constructed.

The literature was reviewed in four areas. Chapter II contains the discussion of three areas in the order named: the cognitive development of the six- and seven-year-old child and related studies; physical education for the elementary school; and television instruction, which included the development of "Ready? Set... Go!" The review in the area of test construction was incorporated into the procedure chapter.

CHAPTER III

PROCEDURES

The construction of an educational test involves several steps, each building on the previous one. These steps require certain skills on the part of the test constructor. Tinkelman (1971) and Lindquist (1951) were in relative agreement in regard to these steps and skills. Tyler (1931) stressed the same skills and emphasized the importance of having lesson objectives which are expressed in behavioral terms. The program on which the instrument for this study was based meets that specification.

The steps are enumerated below:

1. Identify, analyze, and classify the cognitive objectives.
2. Prepare a table of specifications identifying the content to be covered in the test and the cognitive levels at which the objectives are directed.
3. Write the test items with careful attention to types of items and item difficulty and arrange them in two forms.
4. Prepare careful and clear instructions to the examiner for the preliminary test forms.
5. Try out the preliminary test forms to verify time limits, language appropriateness, validity, and reliability.
6. Reconstruct the test into one form.
7. Make provision for review and judgment by a panel of experts.
8. Revise the test and accompanying manual. Assemble the finished instrument for final administration.

9. Determine procedures for administering and scoring the test and prepare any supplementary or accessory materials.

Original plans for this study included an additional step comprised of a pre-tryout of the test on a small sample of children. However, efforts to locate participants in the "Ready? Set... Go!" program from the previous school year were not successful.

The discussion of the procedures will follow the order of the steps listed above. It was necessary, however, to secure permission to use the materials on which the study was based; therefore, that procedure is explained first.

Securing Permission from National Instructional Television

"Ready? Set... Go!" was developed and is produced by National Instructional Television (NIT)*. Saul Rockman, Director of Research, was contacted in October, 1970, for the purpose of seeking permission to use the film series as a basis for the development of a knowledge test. In addition, inquiry was made into the possibility of obtaining funds to help defray expenses involved in the study. All requests were granted. In addition, NIT provided materials needed for the study and an updated list of users throughout the study. Copies of the correspondence are included in Appendix A.

Classification of the Objectives

The lesson objectives included in the "Ready? Set... Go!" manual were identified and classified according to levels within the cognitive

*Later changed to Agency for Instructional Television

domain as found in Bloom's (1956) Taxonomy of Educational Objectives. Only the objectives which might be measured with a group paper-and-pencil pictorial test were included. The classification table shown in Appendix E, Table A, also includes the corresponding test items by number for each of the test forms in which they were used.

Preparing a Table of Specifications

Anastasi (1968), Barrow and McGee (1971), Vaughn (1951), Tinkelman (1971), and other measurement specialists emphasized the necessity for preparing a specific breakdown of the content to be covered and a classification of the behavioral objectives appropriate to the content breakdown. A two-way table of specifications should be constructed in order to insure adequate coverage of the content at the appropriate behavioral level and to avoid construction of too many or too few items on a topic or a particular type of behavior.

Vaughn (1951) pointed out that even though a table of specifications is constructed, it may not always be practical to adhere strictly to the weights represented in the cells of the table. It is possible that the same item may be classified in more than one cell. Also, it may be difficult for the test constructor to design good items for some categories, but he may produce more than are actually required for others. Vaughn (1951) also suggested that the number of items assigned to a cell is often a rough representation of the weights that may be given to these categories in the final test. He stressed that he is not implying that test designers should be careless about item distribution or that planning is unnecessary. A table of specifications

should be carefully prepared, and deviations from the weights represented in each category should occur only if there are good reasons for doing so.

A table of specifications was prepared which identified the content to be covered in the test and the cognitive levels at which the objectives were directed (see Table 2).

The content items which are identified in the table are consistent with the content which is outlined and diagrammed in the "Ready? Set... Go!" teacher's manual (Logsdon and Barrett, 1969, pp. 4-6). The movement components in the first column are identified using the terms Quality, Body Awareness, Space Awareness, and Relationships. The diagram in the manual parallels these headings using "How the Body Moves," "What the Body Does," "Where the Body Moves," and "With What Relationships." Column two breaks these components down into more specific movement elements. The content was adapted from Laban's principles of movement which were discussed in the review of literature.

Fifty content items were identified in the cognitive objectives. In several of the objectives, there was some overlapping into two or more elements. Forty-one were at the knowledge (1.10+) level, six at the comprehension (2.10+) level, two at the application (3.00) level, and one at the analysis (4.10+) level. Since there were no objectives identified at the synthesis and evaluation levels of the cognitive domain, these columns were not included in the table. The number "50" in the table represents the total number of items which comprised the instrument as it was first developed for a preliminary administration of the test.

TABLE 2

Table of Specifications

Content	Objectives in the Cognitive Domain				Total Number of Content Items Desired	Per- cent- age	Number of Items in Tests
	Knowledge	Compre- hension	Appli- cation	Analysis			
	1.10+	2.10+	3.00	4.10+			
Quality	Time Force Space Flow	5	2		7	14	8
Body Awareness	Awareness Skills	5 20	1 1	1	1	7 22	27
Space Awareness	Space Direction Level Pathway	1 2 1 1		1		1 2 2 1	7
Relation- ships	Parts of body to each other	2				2	
	Individuals and groups to each other	3				3	8
	Individuals and groups to objects	1	2			3	
Total Items		41	6	2	1	50	50
Percentage		82	12	4	2	100	

As shown in Table 2, 94 per cent (82 and 12) of the items fell in the lowest levels of the cognitive domain. There were no content items identified under three of the four elements of the quality component, namely, time, space, and flow. These elements seemed difficult if not impossible to measure with still pictures and they were not included. As previously stated, only those objectives and content items which could be measured with a paper-and-pencil pictorial test were included.

It should also be noted in the table that there is a slight discrepancy in the total number of content items desired and the number of items designed in the test. In the quality component there were seven content items identified, but the test included eight items in that category; there were 29 content items identified in the body awareness component, but only 27 test items were constructed; and in the space awareness component there were six content items identified, but seven items were developed in this category. Vaughn (1951) cited reasons for deviating from the weights represented in each category. The deviations identified above and represented in the table of specifications were necessary because of overlapping of content in some cells and the difficulty of designing items in pictorial form in several content areas.

Development of the Test Items

Because the test was to be designed in pictorial form, some type of models or pictures had to be located and identified. Two sources

were used: pictures of children taken by one of the co-authors of the "Ready? Set... Go!" series and pictures found in the "Ready? Set... Go!" teacher's manuals/Level One and Two.

An undergraduate art major agreed to prepare the pictures. The content to be tested, as stated in the lesson objectives, was identified for her. Appropriate pictures were selected and placed in the order that they would appear in the test items. The stems for the questions were attached and the choice for the answer was marked. A form was drawn for the artist with spacing to accommodate five items per page so that she would know the approximate size to make the drawings. An examination of the test booklet in Appendix F reveals the format.

Fourteen three-choice items and 40 four-choice items were prepared from which 50 items would be selected. Parallel forms--A and B--of a paper-and-pencil test were constructed by dividing the 50 items and subjectively arranging them in increasing difficulty. There were 25 items in each form and one sample item to permit the children to practice marking before actual testing began. Parallel forms were used in order to increase the number of items from which to select in preparing the reconstructed instrument. The three-choice items were placed at the beginning with progression to the four-choice items. This arrangement was used to meet the qualifications of a power or level test, with the assumption that the three-choice items were less difficult than the four-choice items.

The time limit for the final test would be determined by asking the teachers to time the process as the test was administered. A

space was provided on the cover of the test booklet for recording the time. In a power test the time limit should be long enough to permit everyone to attempt all items (Anastasi, 1968). It should be noted, however, that since the examiner reads the instructions, the time is controlled as the test progresses.

Preparation of the Examiner's Manual

Another step in test construction is that of preparing careful and clear instructions for the examiner. Various standardized group tests were used to get ideas for the format, instructions, and wording for the examiner's manual. They included American Guidance Service First Grade Screening Test, Boehm Test of Basic Concepts, California Achievement and Short-Form Tests of Mental Maturity, Gates-MacGinitie Reading Test, Metropolitan Readiness Tests, Murphy-Durrell Reading Readiness Analysis, and the Otis-Lennon Mental Ability Test. Other sources containing helpful information were Goolsby (1969), Fenley (1972), Shah (1969), Wallner (1971), Guilford (1971), and Stewart (1970).

The test copies were made from the original with the use of off-set printing on a multilith press. One hundred and fifty copies of each form of the test and 25 copies of the examiner's manual for each form were printed.

Preliminary Study

Securing Permission and Identifying Users

In August, 1973, a letter was written to the North Carolina Department of Public Instruction requesting permission to do the

preliminary administration of the test in North Carolina. Permission was granted and support promised. (Appendix B)

Also granted was a request for time at the September "Ready? Set... Go!" orientation meeting to ask assistance from the directors of "Ready? Set... Go!" workshops across the state. The directors' assistance was needed to help identify teachers and children in the state who would be participating in the program.

At the orientation meeting, a questionnaire, prepared for the purpose of identifying users of the series, was distributed to the participants. The workshop directors gave their reactions and made suggestions for improvement. The form was revised and distributed to the directors of the various workshops. They were to request the participants in their respective 1973-1974 workshops to complete the questionnaire. The response was minimal.

In addition, four workshop directors were asked to identify participants from the 1972-1973 workshops to whom forms could be sent in an effort to locate children who had participated in the "Ready? Set... Go!" series during the 1972-1973 school year. These children were to be used in a pre-tryout administration of the test in late 1973. This attempt was unsuccessful.

In January, 1974, the aid of the North Carolina Department of Public Instruction was sought in trying to further identify users of the program in North Carolina. A list of Health Coordinators throughout the state was provided. A cover letter and questionnaires were mailed to 154 persons asking that they be distributed to the first- and second-grade teachers in their schools who were using "Ready?

Set... Go!"/Level One. (Appendix B). Ten forms were mailed to each coordinator; thus 1540 forms were mailed. These were to help identify the teachers whose situation met the necessary criteria for administering the test:

1. The children were in first or second grade.
2. The children were actively participating during the televised program.
3. At least one follow-up lesson per week was provided.

Twenty-three school personnel responded that the program was not being used in the county or school system, either because of poor television reception or for various other reasons. Of the 64 teachers who returned the completed forms, eleven met the criteria for acceptance, as shown in Table 3. Geographical location was a factor in the selection of subjects. An effort was made to get a good spread across the state. However, because of the small number of respondents meeting the criteria, the spread was not as wide as expected. The teachers selected, however, represented five counties located in the western, central, and eastern parts of the state.

TABLE 3

Preliminary Administration: Questionnaire
Distribution and Return

School Systems Contacted	154
Total Forms Mailed	1540
Completed Forms Returned	64
Additional Responses (Negative)	23
Situations Meeting Criteria	11

Copies of the test and the examiner's manual were mailed to the persons whose situation met the stated criteria. In a cover letter, the teachers were asked to make comments, suggestions, or changes guided by the following items:

1. Vocabulary and language appropriateness
2. Content coverage
3. Clarity of instructions and statement of test items
4. Possible additional instructions
5. Any other points needing special attention

They were asked to make their comments, corrections, or suggestions in the examiner's manual, on the test copy, or on a separate sheet of paper. These comments were used in the reconstruction of the test for the next phase of the study.

Subjects

In May, 1974, following the final lesson of the "Ready? Set... Go!" series, parallel forms of a paper-and-pencil test were administered to 213 first- and second-grade children in eight schools throughout North Carolina, as shown in Table 4. Nine teachers participated in the study, each administering one form of the test to the children in her group. In other words, all groups of children did not take the same test. One teacher administered Form A to a first-grade group and Form B to a group of second-grade children. An effort was made to get an equal distribution of Forms A and B of the test to the first and second grades. The information from this preliminary testing served as the basis for the revision of the items and the reconstruction of the items into one final form.

TABLE 4
Preliminary Administration: Test
Distribution and Return

Teacher by Number	Number Distributed				Number Returned						
	Form Grade	A		B		Form		Grade		Sex	
		1	2	1	2	A	B	1	2	B	G
1		25				25		25		12	13
2		26				26		26		11	15
3*		---	---	---	---	---	---	---	---	---	---
4		26				25		25		12	13
5				25		23		23		11	12
6				24		23	16	7		13	10
7				31		18	18			8	10
8**		27				0	---	---	---	---	---
9		31		21		28	21	28	21	17/10	11/11
10				26		24	24			13	11
11*		---	---	---	---	---	---	---	---	---	---
Subtotal		57	78	81	46	104	109	111	102	107	106
Total		135		127		213		213		213	

*Situations which met criteria but not selected
**Tests not returned

Scoring and Statistical Analysis

The scoring of the tests and the statistical analyses were done in the Academic Computer Center at the University of North Carolina at Greensboro. The Testan Item Analysis computer program was used for

the validity and reliability of the instrument. The items were evaluated by use of Flanagan's method of item analysis to reveal the difficulty of each item, the power of each item to discriminate between the students who knew and those who did not, and the amount that each possible response functioned by noting the frequency with which each response was chosen (Barrow and McGee, 1971). The top and bottom 27 per cent of scores were used "because this division provided the greatest efficiency in estimating item discrimination under certain reasonable assumptions" (Henrysson, 1971, p. 144). Only items with a difficulty rating between 10 and 90 per cent and an index of discrimination above .19 were considered for the reconstruction of the test into one form. Responses failing to function by three per cent of the children were either discarded or artistic adjustments were made so that the response or the item could be retained. Tables 5 and 6 give the results of the item analyses. The items which show an asterisk did not meet at least one of the criteria of difficulty, discrimination, and function and were therefore candidates for revision.

Questions which did not meet the three criteria were discarded or revised for the reconstruction of the test. This process was used to improve the content and internal validity of the test. Content validity is the extent to which a test measures a representative sample of the subject matter and behavioral changes under consideration (Anastasi, 1968). Internal validity was assured by using the item analysis technique. Content validity was assured by making the items reflect the content of the television series.

TABLE 5
Results of Item Analysis--Form A

Item	Functioning of Responses				Correct Response	Difficulty Rating	Index of Discrimination
	1	2	3	4			
1.*	<u>.02</u>	.17	.81		3	.81	.45
2.*	<u>.96</u>	.03	<u>.01</u>		1	<u>.96</u>	<u>.06</u>
3.	.57	.17	<u>.26</u>		1	<u>.57</u>	<u>.67</u>
4.*	.43	.35	.22		2	.35	<u>.01</u>
5.	.80	.09	.12		1	.80	<u>.39</u>
6.	.63	.23	.14		1	.63	.68
7.*	.05	.88	.05	<u>.02</u>	2	.88	.23
8.	.26	.08	.51	<u>.15</u>	3	.51	.51
9.*	.18	.77	<u>-.02</u>	.03	2	.77	.32
10.	.56	.25	<u>.06</u>	.13	1	.56	.61
11.*	<u>.01</u>	.04	.08	.88	4	.88	.26
12.	<u>.07</u>	.33	.55	.05	3	.55	.48
13.	.14	.16	.24	.45	4	.45	.44
14.	.19	.14	.36	.31	4	.31	.64
15.	.41	.05	.03	.51	4	.51	.28
16.*	.13	.30	.31	.27	1	.13	<u>.00</u>
17.*	.67	.13	.09	.11	1	.67	<u>.09</u>
18.*	<u>.02</u>	.15	.71	.12	3	.71	<u>.38</u>
19.*	<u>.02</u>	.18	.79	<u>.02</u>	3	.79	<u>-.04</u>
20.*	<u>.16</u>	.51	.11	.22	4	.22	<u>.11</u>
21.	.06	.68	.18	.08	2	.68	.45
22.*	.88	.06	<u>.01</u>	.06	1	.88	.26
23.	.26	.14	<u>.23</u>	.37	4	.37	.21
24.	.80	.08	.09	.04	1	.80	.35
25.	.08	.15	.58	.19	3	.58	.61

* Items that did not meet one or more of the criteria

TABLE 6
Results of Item Analysis--Form B

Item	Functioning of Responses				Correct Response	Difficulty Rating	Index of Discrimination
	1	2	3	4			
1.*	.17	.14	.69		3	.69	<u>.18</u>
2.*	.31	.37	.32		2	.37	<u>.13</u>
3.*	.37	.30	.33		1	.37	<u>.13</u>
4.	.12	.15	.73		3	.73	<u>.25</u>
5.	.83	.09	.07		1	.83	<u>.31</u>
6.*	<u>.02</u>	.20	.78		3	.78	.28
7.*	.81	<u>.00</u>	<u>.02</u>	.18	1	.81	.31
8.	.08	<u>.36</u>	<u>.07</u>	.48	4	.48	.72
9.	.23	.22	.51	.04	3	.51	.34
10.	.06	.64	.26	.05	2	.64	.22
11.*	.06	.25	.13	.56	1	<u>.06</u>	<u>-.06</u>
12.*	.89	.06	.04	<u>.01</u>	1	.89	.22
13.*	.21	.36	.25	<u>.18</u>	4	.18	<u>-.06</u>
14.*	<u>.02</u>	<u>.01</u>	.89	.08	3	.89	<u>.19</u>
15.*	.06	<u>.47</u>	.35	.12	3	.35	<u>.16</u>
16.*	.09	.80	.11	<u>.00</u>	2	.80	.19
17.	.24	.13	.56	<u>.07</u>	3	.56	.44
18.	.13	.11	.64	.12	3	.64	.28
19.*	.29	.21	.39	.10	1	.29	<u>.16</u>
20.*	.47	<u>.02</u>	.11	.40	4	.40	<u>.34</u>
21.*	.81	.05	.14	<u>.01</u>	1	.81	.25
22.	.03	.05	.88	<u>.05</u>	3	.88	.22
23.	.10	.15	.68	.07	3	.68	.34
24.	.09	.74	.08	.08	2	.74	.19
25.	.61	.11	.26	.03	1	.61	.44

* Items that did not meet one or more of the criteria

Reliability, which "indicates the consistency with which a test can rank the students from good to poor" (Barrow and McGee, 1971, p. 405), was checked by using the Kuder-Richardson Formula 20. This tool is acceptable for a power or level test.

The researcher also discussed the format, wording, and instructions with a reading specialist, a first/second grade teacher, and an alert first grader in the local school. Helpful feedback prompted adjustments in the reconstruction and revision of the tests into the form that was submitted to the jury for review. One such adjustment involved the changing of the word "through" to "on" in the instructions and reading of each item: "PUT A MARK 'ON' THE CORRECT PICTURE." To insure that the X placed "on" the picture was large enough to detect when scoring, instructions were changed to read: "MAKE A BIG X ON THE PICTURE." Results of the first administration of the test indicated the need for this change.

Reconstruction of the Instrument

The next step involved the reconstruction of the instrument into one test by using the results of the analyses of Forms A and B. Thirty-eight items were selected, revised if needed, and placed in order of increasing difficulty between 90 per cent (easiest) and 10 per cent (most difficult). Three-response items were made into four-response items for consistency, since the item analyses of the two forms did not reveal that three-response items were necessarily easier than four-response items. Since the desired length of the final test was to be between 30 and 40 items, 38 were selected. To avoid boredom

and fatigue and to keep within the anticipated attention span of the students, the desirable time limit was considered to be 30-35 minutes. Teachers in the preliminary study had reported needing from 20 to 25 minutes to administer the 25-item forms of the test.

The examiner's manual was revised accordingly. The information gained from the comments and suggestions made by the teachers who had administered the tests was used to make necessary changes in the instructions and directions.

Intermediate Step

In July, 1974, appropriate persons were contacted to ask permission for the pilot study to be administered in a specific state. Through the assistance of the Coordinator of Health and Physical Education in that state, permission was granted by the Department of Education, and a list of Health and Physical Education directors was provided.

In August, 1974, twenty-five forms and a cover letter were mailed to 34 City/County State Directors. Three responded negatively, indicating either that they were not using the series or that they could not help. Seven completed forms were returned. Only two teachers indicated a willingness to participate in the study. Few teachers or children were identified as users of "Ready? Set... Go!"/Level One.

Since the intermediate step as described was to have been the pilot study, an alternate plan had to be pursued. The administration of the test in North Carolina, which was previously planned as a pre-tryout administration, had to be considered the pilot or preliminary study. The "Ready? Set... Go!" program was gradually being phased out in most states.

Selection of a Jury of Experts

An important step in the development of a test is the review of the instrument by individuals knowledgeable in the areas of test construction. There should be a minimum of three persons qualified in the subject matter area to check for accuracy and appropriateness of subject content and the matching of objectives to curriculum and to the test items.

For this study, six persons were selected: one of the co-authors of the "Ready? Set... Go!" series, the television teacher of the series, a physical education and motor development specialist well acquainted with the Movement Education concept and "Ready? Set... Go!" and two college teachers and one elementary teacher who had worked extensively with the material in the manual by conducting workshops and using the concept with children.

At least two technicians were needed to check the technical merits of the test apart from content. Two university professors who were specialists and authors in the area of knowledge testing were asked to serve on the jury.

The editorial quality--including punctuation, spelling, uniformity of style, language appropriateness and vocabulary--was edited by three individuals. Two persons on the University faculty in the School of Education and a doctoral student in English with an emphasis in language arts were asked to use their expertise in the third category.

A letter and stamped self-addressed card were sent to each member of the jury requesting their assistance in these specific capacities. All responded in the affirmative. (Appendix C)

In November, 1974, the following materials were sent to the eleven members of the jury:

1. An evaluation form: Response Form Related to Content Areas
2. Objectives by items and cognitive levels
3. A condensed form of Bloom's taxonomy--cognitive domain
4. A condensed form of the table of specifications
5. An examiner's manual
6. A test booklet

Ideas for some of the information included in the materials were taken from Henson (1963, pp. 14 and 49). All of these materials are located in Appendix C.

The jury was requested to use the form and/or write comments directly in the examiner's manual or on the test booklet itself. A combination of the two proposed methods was used by the jury members. The comments, criticisms, and reactions by the jury were used to revise the instrument for the final administration.

Revisions Based on Review and Judgment by Jury

Some of the suggestions concerning revisions for the test booklet were as follows:

1. Show children of different sexes working together in group pictures and mix the sexes in separate responses in each item.
2. Show black and white children throughout the test.
3. If possible, be sure all parts of the child's body are in the pictures.

Suggestions made relating to the examiner's manual were as follows:

1. Include comment about testing situation in an open classroom environment.
2. Ask the child to point to his name when told to check to be sure it is on his or her test booklet.
3. In the instructions, clarify that there is only one answer to each item.
4. Underline the content in the statement or instructions for all items.
5. Consider the use of a transparency showing the two sample items when demonstrating how to mark the items.
6. Permit the reading of the statement more than once per item.
7. Say: LOOK AT YOUR OWN BOOK rather than DO NOT LOOK AT ANY BOOK EXCEPT YOUR OWN.

Further suggestions were given:

1. Change the name of the test from "Ready? Set... Go!" Movement Achievement Test to "Ready? Set... Go!" Knowledge Achievement Test.
2. Call out the number of the item at the top of each page as a check to be sure all are at the right place.
3. Use the word PUT A MARK "ON" instead of "THROUGH."

Retention, Revision, or Deletion of Items

The Jury members in the content area were asked to mark an X on the picture which in their opinion was most nearly correct or, if two seemed equally correct, to mark an X on both. Table 7 shows the responses marked by the members of the jury. If five of the six members chose the same picture, the item was retained with no change unless the item analysis showed some other reason for its deletion or revision.

All six members chose the correct (anticipated) picture for 18 items. All six chose the correct picture for six other items but indicated one possible alternate choice. All six chose the correct picture for one other with one suggesting two other possible choices. Five chose the correct picture for nine other items; on five of these one person did not make a choice. The response for the other four items raised too many questions or offered too many alternatives to justify revision and these items were discarded.

The comments and suggestions made by the members of the jury were used to make further revisions of the test instrument and examiner's manual. Five items were deleted and minor adjustments were made in the remaining 33 items retained for use in the final test. A list containing the items used in the final test, the major suggestions by the experts, and comments concerning revision or adjustments can be found in Appendix C.

Use of Spache Readability Formula for Grades 1-3

Vocabulary and language appropriateness were also checked by Dale's (1931) word list as revised by Stone (1956). Stone suggested

TABLE 7
Responses Marked by Members of Jury

Item	Jury of Experts						Key
	A	B	C	D	E	F	
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	1	1 & 2	1 & 4	1 & 4	1	1	1
4	1	1	1	1	1	1	1
5	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
7	1	1	1	1 & 3	1	1 & 3	1
8	1	1 & 4	-	1	2 & 4	1	1
9	2	2	2	2	2 & 4	2	2
10	1	4	1	1	1	1	1
11	2	2	2	2	2	3	2
12	2	2	1	2	2	2	2
13	4 & 3	3	-	3	3	3	3
14	3	3	3	3	3	3	3
15	3	3	3	3	3	3	3
16	2	2	2	2	2	2	2
17	2	2	2	2	2	2	2
18	1	1	-	1	1	1	1
19	1	1	-	1	1	1	1
20	3	3	3	3	3	3	3
21	1	1	1	1	1	1	1
22	3	3	3	3	3	3	3
23	3	3	3	3	3	3	3
24	2	1 & 2	1 & 2	1 & 2	2	1 & 2	1
25	1	1	1	1	1	1	1
26	3	3	3	3	3	3	3
27	4	4	4	4	4	4	4
28	3	3	-	3	3	3	3
29	3	3	1 & 3	3	3	3	3
30	4	4	4	4	4	2 & 4	4

CONTINUED

TABLE 7 CONTINUED

Item	Jury of Experts						Key
	A	B	C	D	E	F	
31	4	4	4	4	4	4	4
32	4	4	4	4	4	4	4
33	4	4	-	4	4	4	4
34	3	3	3	4	1 & 4	3	3
35	1	1	-	1	1	1	1
36	2	-	-	1	2 & 4	1	1
37	4	4	-	4	4	4	4
38	3	3	3	3	1 & 3	3	3

Notes. Only the members of the jury selected for the content area were asked to mark the responses.

These responses were made on the reconstructed items following Forms A and B and preceding the final form of the test.

- indicates no response selected by jury member.

that lists by E. L. Thorndike should be modernized to include more recent words. However, Spache compared the two lists and found no consistent differences. Stone's Revision of the Dale List of 769 Words (Spache, 1970) was used in applying the formula as a check for this study. A list compiled by Johnson (1971) was also used.

The Spache Readability Formula was applied to three samples from the first, middle, and last third of the test manual. The results are shown in Table 8. Spache pointed out that the use of the formula should be avoided on material that is not typical of continuous matter. The examiner's manual is probably an example of matter that is not continuous, but the formula was used in the hope that its application might reveal some helpful information.

The results of the formula indicated a 2.94 grade placement. Grade placement is an accepted continuum for reading ability; thus reading ability corresponds to school grades. Joos (1973, p. 1) stated: "A useful assumption is that reading skills are very much like other learned skills in that the population of readers may be thought of as possessing ability which gradually increases with motivation." He continued: "Briefly, reading is a developmental skill which can be laid on the grade level scale with reasonable success."

It was felt that the grade placement determined by applying the formula was not a true indication of the difficulty of the test. The words classified as "unfamiliar" when applying the formula were either words repeated throughout the instructions for the test, used in the objectives and content in the "Ready? Set... Go!" lessons, or were

TABLE 8
Application of the
Spache Readability Formula for Grades 1-3

Article or Book	"Ready? Set... Go!" Knowledge Achievement Test		Date	March, 1975		
Author	Virginia Hart		Publisher	Dissertation		
	Page	<u>5</u>	Page	<u>7</u>	Page	<u>9</u>
		<u>#4</u>		<u>#14</u>		<u>#25</u>
	From	<u>Place</u>	From	<u>Place</u>	From	<u>Move</u>
		<u>in #6</u>		<u>in #16</u>		<u>in #27</u>
	To	<u>Picture</u>	To	<u>Pictures</u>	To	<u>Shape</u>
1. Number words		<u>104</u>		<u>101</u>		<u>103</u>
2. Number sentences		<u>11</u>		<u>9</u>		<u>8</u>
3. Number words not on Stone Revised Word List		<u>7</u>		<u>7</u>		<u>5</u>
4. Average Sentence Length (Divide 1 by 2)		<u>9.45</u>		<u>11.22</u>		<u>12.88</u>
5. Per cent hard words (Divide 3 by 1; multiply by 100)		<u>6.7</u>		<u>6.9</u>		<u>4.9</u>
6. Multiply (4) by .141		<u>1.33</u>		<u>1.58</u>		<u>1.81</u>
7. Multiply (5) by .086		<u>.576</u>		<u>.593</u>		<u>.421</u>
8. Constant		<u>.839</u>		<u>.839</u>		<u>.839</u>
9. Estimated grade placement (Add 6, 7, and 8)		<u>2.745</u>		<u>3.012</u>		<u>3.070</u>
Average Grade placement of <u>3</u> Samples <u>2.94</u>						

Analyzed by Virginia Hart

words often used in other achievement tests used at the primary level. It should also be noted that the reading was done by the examiner, and a child understands spoken words which he cannot read.

Printing of the Final Instrument

The final editions of the test and examiner's manuals were again made from an original with the use of off-set printing on a multilith press; they were put into booklet form at the press.

Final Administration

Three states, selected from the list of 1974-1975 users provided by National Instructional Television, were contacted to request permission to administer the test in the state. Assistance was also requested in locating subjects for the final administration of the test. One state reported no participants and there was a personnel change in another. To attempt a test administration in either of these states would have been futile.

Oklahoma City, Oklahoma, responded favorably and indicated a willingness to be of assistance. The Physical Education Consultant of the Department of Curriculum Services was instrumental in identifying the Research Coordinator for the Oklahoma City Public Schools. A proposal was submitted to the Research Committee for consideration. Permission was granted and the contact persons were identified via a Personnel Directory. A cover letter and forms for the purpose of identifying teachers whose situation met the necessary criteria for administering the test were mailed to the principal of each of the 68 elementary or primary schools in the city. The criteria for

selection were the same as those listed for the preliminary study. A total of 291 forms were mailed. The number varied according to the number of primary teachers listed under each school. Refer to Appendix D for materials involved in the Oklahoma administration.

Twenty-seven completed forms were returned. There were four additional responses which indicated that the teachers in those schools did not participate in the program. Of the 27 returning the completed form, seven indicated a willingness to participate by administering the test. No situation met all three criteria; the only criterion which could be met, other than the fact that they were using the series in some way, was that the subjects were first- and second-grade children. Test booklets and examiner's manuals were sent to these seven teachers.

Because of the small number of forms returned and an even smaller number of affirmative replies, two teachers in North Carolina who had assisted in the preliminary study the previous year were asked to participate in order to increase the size of the sample.

Two hundred and forty-two test booklets and the examiner's manuals were distributed to nine teachers; 170 completed test booklets were returned. Tables 9 and 10 show a summary of the distribution and return of forms and tests.

TABLE 9

Final Administration: Questionnaire
Distribution and Return

Schools Contacted	68
Total Forms Mailed	291
Completed Forms Returned	27
Additional Responses (Negative)	4
Number Affirmative Responses	7 + 2

TABLE 10

Final Administration: Test
Distribution and Return

Teacher by Number	Number Distributed	Number Returned					
		State		Grade		Sex	
		Oklahoma	North Carolina	1	2	B	G
1	25	21		10	11	12	9
2	29	28		28		11	17
3	27	22		22		13	9
4	25	23		23		11	12
5	28	26		26		13	13
6	28	0					
7	25	--					
8*	26		25	25		16	9
9*	29		25	25		14	11
Subtotal		120	50				
Total	242		170	159	11	90	80

* Represents 2 participating teachers in North Carolina who were willing to assist in order to increase the size of the sample.

-- Subjects were third and fourth graders.

Subjects

The subjects were 170 first- and second-grade children from seven schools in Oklahoma City, Oklahoma, and one school in Boone, North Carolina. Nine teachers participated in the study, each administering the test to the children in her group. The tests from one teacher could not be used because the children were in the third and fourth grades.

Administration of the Test

A group-administered paper-and-pencil pictorial test was administered to the subjects in May, 1975, following the final lesson of the "Ready? Set... Go!" series. The final test booklet contained two sample items and 33 test items. All instructions concerning time limit, materials needed, testing environment and other necessary information were in the examiner's manual. As before, the teacher read the statements or questions and the children marked the answers in the test booklets. Copies of the examiner's manual and test booklet, along with the test key, are located in Appendix F.

Analysis of Data

As in the preliminary study, validity was determined by a Flanagan's item analysis. The KR_{20} formula was used to determine the reliability coefficient. The scoring of the tests and statistical analysis were done in the Academic Computer Center at the University of North Carolina at Greensboro. The Testan Item Analysis computer program was used for the validity and reliability of the instrument.

The t-test of significance of difference between the means was used in testing the hypotheses:

1. There will be no significant difference in the cognitive scores of boys and girls.
2. There will be no significant difference in the cognitive scores of North Carolina and Oklahoma children.

Hypothesis number 2 was changed from a grade comparison to a comparison of states in the final study because the sample included only 11 second-grade children.

The results of the analysis will be discussed in Chapter IV.

Summary

The purpose of this chapter was to present the procedures used in the development of a group-administered paper-and-pencil pictorial test based on "Ready? Set... Go!"/Level One. A sample of 213 first- and second-grade children was used in the preliminary study and 170 children were used in the final administration of the test.

The procedures described the design of the study, the identification of the sample, the construction of the instrument, the selection of a jury of experts to review and judge the instrument, and the statistical methods used to determine the validity and reliability of the test and to test the two hypotheses.

CHAPTER IV

RESULTS

The purpose of this study was to construct a group-administered paper-and-pencil test for first and second grades to assess knowledges and understandings based on "Ready? Set... Go!" a television course for elementary physical education/Level One. The test was designed in pictorial form. The validity and reliability of the instrument were to be established. Subpurposes included the testing of two hypotheses which will be stated as they are discussed. Chapter IV will review the findings of the preliminary study and present the results of the final administration of the test.

Review and Discussion of the Reliability and Validity of
the Preliminary Administration of the Test

Parallel test forms--A and B--were constructed for the preliminary study in order to have a sufficient number of items from which to select in reconstructing the instrument for the final administration. Table 11 gives a summary of the descriptive statistics for the two forms of the test. The results of the Flanagan's item analysis for each form were reported in Tables 5 and 6.

Test Reliability

An analysis of the data revealed that the reliability coefficient was .6579 for Form A and .3400 for Form B. The reliability of Form A was too low to be satisfactory for a final test form. As previously

indicated, the administration of Forms A and B was to serve as a try-out to identify weaknesses and/or strengths of the test before the next administration, described in Chapter III as an Intermediate step. Therefore, a reliability of .6579 was acceptable at this stage. On the other hand, the reliability coefficient of .3400 for Form B was quite disappointing and unsatisfactory, even for a first attempt.

TABLE 11
Summary of Descriptive Statistics and
Reliabilities from Preliminary Study Data

	Form A	Form B
Mean	15.3365	14.9633
Variance	12.8662	6.9801
Standard Deviation	3.5870	2.6420
Reliability (KR_{20})	0.6579	0.3400
Number of Respondents	104	109
Number of Items	25	25

The most surprising fact was the variability between the coefficients of the two forms of the test. The term "parallel test forms" has been used in this paper when referring to Forms A and B. It might have been more appropriate to refer to them simply as Forms A and B of the test and omit the term "parallel." The purpose for having two forms was to get feedback on a larger number of items than seemed advisable to administer to first and second graders in one time period

since attention span was a factor. Selected items from the two forms were to comprise the one final instrument.

Klein (1965) pointed out that the literature discusses several kinds of reliability; one of these is the coefficient of internal consistency, which is the stability and the consistency with which the student performs from one item to another within a test. There is no specific explanation for the variability in the results of the two forms or in the low reliability which was yielded in both forms, especially Form B. It was assumed that the two forms were more equivalent.

Askov (1972) suggested that reliability can be affected or influenced by the attitude of the children taking a test or the attitude of the teacher giving the test. Another factor might be variations in testing time and procedure; an effort was made, however, to standardize the procedures for this test.

According to Conrad (1951), a test which has not been criticized by subject matter experts before preliminary administration will probably yield a lower reliability than one which has been reviewed. He also speculated that there are advantages to having several persons involved in the construction of the items in order to eliminate biases. Overlapping among items or clues to the correct answer would also reduce reliability.

Wallner (1971) and Anastasi (1968) stated that the kind of furniture used and distractions and interruptions within the room at the time of testing might alter the reliability. These factors might vary from the traditional to the open classroom environment.

The open classroom setting was in use in several of those participating in the study. Wallner (1971) added that consideration must also be given to the fact that the ability of the children to perceive or conceptualize might be affected by emotional, intellectual, or physical problems; this in turn would influence the reliability of the test. No effort was made in this study to identify or eliminate such problem students. However, one teacher in the final administration did identify five students who were classified as educable mentally retarded. An examination of the scores of the five students revealed a normal range of scores. All administrations of the test were made by the regular teacher in the natural setting to all children present on the test day. One or more of the aforementioned factors might have been significant in influencing the results of the preliminary administration of the test.

Test Validation

A close examination was made of each item in the two forms with emphasis on the difficulty rating, the index of discrimination, and the functioning of each response. Nineteen items were selected from Form A and 13 from Form B to be used in the reconstructed instrument. One new item was added. The selected items were either revised if necessary or left in their original form. Only items with a difficulty rating between 10 and 90 per cent and an index of discrimination above .19 were considered for the reconstruction of the test unless it was felt that revisions could be made and the item retained. Responses failing to function at the three per cent level were discarded or revised and retained. Five items which had failed to discriminate

above .19 were revised and used in the final instrument in order to have a sufficient number of items for review by the jury. One decreased in discrimination and four increased above .19 when administered in the final study.

Other Statistical Analyses

Subpurposes of the preliminary study included the testing of two hypotheses. Table 12 includes a summary of the data which were analyzed to test the hypotheses. The hypotheses were tested using the scores from both Forms A and B, without regard to the low reliability of Form B. The significance of the conclusions could be tempered by this fact.

TABLE 12
Summary of the Data Used to Test the Hypotheses
Posed for the Preliminary Study

Group	Number	Variance	Mean	t
Sex				
boys	107	8.8496	15.2150	.1267
girls	106	10.9169	15.1604	
Grade				
1st	111	9.3869	14.3964	-3.97*
2nd	102	8.9779	16.0490	

Note. Based on a possible score of 25

* Significant at .01 level of significance

Hypothesis 1: There will be no significant difference
in the cognitive scores of boys and girls.

Because there was no a priori evidence to indicate that boys would score significantly higher than girls or vice versa, the two-tailed test was employed.

Upon examining histograms constructed from the two samples and then applying the F-test for equality of variances, it was determined that the underlying assumptions of the two-sample t-tests were satisfied. This procedure is used to compare the means of two populations whose distributions are assumed to be normal with equal variances.

A t equalling .1267 was computed. Since H_0 is accepted unless $|t| > t_{\alpha/2, n_x+n_y-2}$ where α is the level of significance, we accept H_0 for any reasonable value of α and conclude that the mean scores for boys and girls do not differ significantly.

Hypothesis 2: There will be no significant difference in the cognitive scores of the first- and second-grade children.

Because it was felt that there might be a difference between grades one and two, the one-tailed test was employed. The assumptions of normality and equality of variances were verified as in the previous problem; the two-sample t-tests were applied and a $t = -3.97$ was computed. Since H_0 is rejected and H_a accepted if and only if $t < -t_{\alpha, n_x+n_y-2}$, and $t_{\alpha, n_x+n_y-2} = 2.33$ for $\alpha = .01$, $n_x = 111$ and $n_y = 102$, we reject H_0 at the 1 per cent level of significance and conclude that the mean score for second graders is significantly higher than the mean score for first graders.

A review of literature suggested that second-grade children should be expected to score higher on a paper-and-pencil test than first-grade children. The results of most cognitive or perceptual tasks administered to children reveal that the older the child, the higher will be his level of performance. Rohwer (1971) explained Gagne's continuity theory. According to the theory, the older child is considered to have greater intellectual power than the younger child because he has experienced and supposedly learned more. These past learnings, if relevant, could be transferred to new tasks. Strauss (1972), Ward (1970), Gagne (1970), Piaget (1952) have all discussed the same topic and concur.

Analysis of Data for Final Administration

The final form of the "Ready? Set... Go!" Knowledge Achievement Test was administered to 159 first- and 11 second-grade children in two states. The test was read aloud by the regular classroom teacher; each item was read twice. Teachers were asked to adhere to a designated time limit. The data were analyzed to determine the reliability and validity of the instrument; also, two hypotheses were tested. The results are discussed in the order mentioned. Table 13 summarizes the descriptive statistics from the final administration.

Test Reliability

"Reliability indicates the consistency with which a test can rank the students from good to poor." It is affected by such factors as the number of items, the ability of items to discriminate, the testing situation, and the difficulty of the test (Barrow and McGee, 1971, p. 405).

TABLE 13

Summary of Descriptive Statistics from Final Administration

Group	Number of Respondents	Mean	Variance	Standard Deviation	Range
All pupils	170	22.0471	20.6605	4.5454	7-31
All boys	90	22.1444	17.3609	4.1666	7-31
All girls	80	21.9375	24.6163	4.9615	7-29
Oklahoma pupils	120	21.9417	26.0218	5.1012	7-31
North Carolina pupils	50	22.3000	7.9694	2.8230	17-28
All first grade	159	21.2830	19.6728	4.4354	7-28
All second grade	11	25.7273	9.8184	3.1334	19-30

The Kuder-Richardson formula method for checking reliability was used because it requires only one administration of the test and it does not necessitate the splitting or dividing of the test. It was pointed out by Richardson and Kuder (1939) that Formula 20 is adequate for most situations. However, the formula provides a lower reliability than might be obtained by a more rigorous formula or some other method.

The Kuder-Richardson formula method was chosen because it is appropriate for use on a power or level test where the items are arranged in difficulty from easy to difficult. An attempt was made in the final instrument to structure the test in such a manner. Items were arranged by using the difficulty indices from the data obtained from Forms A and B. Anastasi (1968) suggested that arranging the items

in order of difficulty permits the subject to begin with the less difficult items and proceed to items of increasing difficulty. This has a tendency to build confidence as the subject continues with the test.

Table 14 includes a summary of the reliability coefficients for the final administration and identifies the various groupings involved.

TABLE 14
Summary Table of the Reliability Coefficients
for the Final Administration

Group	Number	K-R ₂₀
All pupils	170	0.7334
All boys	90	0.6815
All girls	80	0.7814
Oklahoma pupils	120	0.7885
North Carolina pupils	50	0.3611
All first grade	159	0.7183
All second grade	11	0.6143

The reliability coefficient of .7334 yielded by all pupils taking the final form of the test was the primary concern for this study. However, an examination of the coefficients of each variable revealed results that no doubt affected the total reliability. The scores of North Carolina pupils yielded a reliability of .3611; the reliability for second-grade pupils was .6143 but there were only 11 second graders. There is no specific explanation for the low reliability yielded by

the scores of the 50 subjects from the North Carolina group. All girls' scores yielded a higher reliability than all boys--.7814 and .6815, respectively. Factors which may have influenced these variances were cited in the discussion of the results of the preliminary administration.

In an article dealing with the dimensions of testing, Carver (1974, p. 514), in reference to psychometric tests, stated: "The variance of test scores has a great deal to do with this type of consistency; that is, the less the variance the more likely that the discriminations will change between occasions . . .; if there is no variance then by definition there can be no psychometric reliability." The variance for the scores of North Carolina pupils was only 7.9694.

Barrow and McGee (1971) identified several additional items which influence reliability: the length of the test, the number of items, the ability of the items to discriminate, the degree to which the items measure knowledge in one area of information, the difficulty level--50 per cent is recommended--and the testing situation. Again, one or more of these factors could have affected the results.

It is stated by Guilford (1965, p. 104) that reliability coefficients are expected to be in the upper brackets, usually .70 to .98, but "to be sufficiently reliable for discriminating between individuals, a test should have a reliability coefficient of at least .94." The .7334 reliability of the test in its final form fell within the upper bracket thus yielding a satisfactory reliability coefficient. Considering such factors as the age of the subjects, the uniqueness

of the testing situation (the test was pictorial in nature thus involving perception as well as cognition), and other factors cited previously, the result seems very acceptable.

Test Validation

Content validity, as previously defined, is "the extent to which a test measures a representative sample of the subject matter content and behavioral changes under consideration" (Gronlund, 1965, p. 62). According to Barrow and McGee (1971), validity measures the truthfulness and honesty of a test. They identify two types of validity-- empirical and statistical. Empirical or curricular validity is achieved if the content of the test correlates with the units of instruction. In this study the lesson objectives found in the "Ready? Set... Go!" instructor's manual were used in identifying the content to be tested. The test was studied by authorities referred to as a Jury of Experts. The results of their reviewing and judging were discussed in Chapter III as a part of the procedure used in the development of the final form of the test. A Flanagan's Item Analysis was used to determine statistical validity, which is more technical and answers the question "of the internal ability of the test to discriminate between those who 'know' and those who 'do not know'" (Barrow and McGee, 1971, p. 394).

Functioning of Items. Table 15 reveals the results of the item analysis. It shows the percentage of the responses and the frequency of the responses for each item. For a response to function satisfactorily, it should be chosen, according to some authorities, by at least 3 per cent of those taking the test.

TABLE 15

Function Results of the Item Analysis Showing Percentage
of Responses and Frequency of Responses for
Each Item in the Final Administration

Item #	Percentage of Responses				Frequency of Responses				Keyed Response
	1	2	3	4	1	2	3	4	
1	0.75	0.05	0.19	<u>0.01</u>	125	9	31	2	1
2	0.05	0.05	0.04	0.85	9	9	6	141	4
3	0.82	0.07	<u>0.02</u>	0.08	138	12	4	14	1
4	0.94	0.03	<u>0.00</u>	0.03	159	5	0	5	1
5	<u>0.02</u>	0.14	0.80	0.04	3	23	131	7	3
6	0.11	<u>0.02</u>	0.25	0.62	19	3	41	104	4
7	0.85	<u>0.10</u>	0.04	<u>0.01</u>	142	17	7	1	1
8	0.03	0.96	<u>0.00</u>	<u>0.01</u>	5	162	0	1	2
9	0.71	0.06	<u>0.02</u>	<u>0.21</u>	115	10	4	34	1
10	<u>0.01</u>	0.94	<u>0.04</u>	<u>0.02</u>	1	158	6	3	2
11	0.05	0.06	0.04	0.84	9	10	7	140	4
12	0.06	0.03	0.85	0.06	10	5	144	10	3
13	0.06	0.05	0.76	0.13	10	8	128	22	3
14	0.09	0.81	0.05	0.04	16	138	9	7	2
15	0.15	0.65	0.14	0.05	26	111	24	9	2
16	0.85	0.07	0.04	0.05	142	11	6	9	1
17	0.10	0.32	0.11	0.48	16	53	18	81	4
18	0.21	0.28	0.34	0.18	35	47	57	30	3
19	0.72	0.10	0.11	0.07	121	16	19	12	1
20	0.11	0.67	0.17	0.06	18	113	28	10	2
21	0.06	0.09	0.80	0.05	10	15	134	8	3
22	0.46	0.19	0.09	0.26	77	31	15	44	1
23	0.32	0.31	0.33	0.05	52	50	53	8	1
24	0.08	0.08	0.81	0.04	13	13	137	6	3
25	0.60	0.11	0.05	0.24	102	18	9	41	4
26	0.13	0.70	0.12	0.05	21	118	30	9	2
27	0.04	<u>0.02</u>	0.77	0.17	6	3	130	29	3
28	0.08	<u>0.11</u>	0.14	0.68	14	18	23	115	4
29	0.48	0.11	0.09	0.32	82	19	15	54	1
30	1.18	0.39	0.13	0.30	30	66	22	50	2
31	0.11	0.31	0.49	0.08	19	51	82	14	3
32	0.21	0.21	0.18	0.40	36	35	30	67	4
33	0.23	0.58	0.13	0.06	39	97	22	10	2

Note. Underlined responses failed to meet the 3 per cent criterion.

The criterion of 3 per cent was set for developing the instrument for this study. Analysis of the results indicated that the percentage of responses ranged from 0 to 96 per cent. There were two responses that failed to function, four responses were chosen by 1 per cent, six by 2 per cent. All responses functioned in 23 of the 33 items. Two responses functioned below 3 per cent in items 8 and 10; one functioned below the criterion level in items 1, 3, 4, 5, 6, 9, and 27. It might be interesting to note that all but one of the items in which responses failed to function satisfactorily were in the first 10 items in the test. There was only one response which fell below the criterion of 3 per cent in items 11-33; response number two in item number 27 was selected by 2 per cent of the subjects. If there were to be further revision of the instrument, attention would be focused on the first 10 items, with the exception of item number 2.

Difficulty Rating. The criterion for the selection of items from Forms A and B used in the preliminary study was a difficulty rating between 10 and 90 per cent. The items chosen ranged from 22 per cent to 89 per cent. An examination of the data from the final administration of the test revealed that the difficulty rating ranged from 24 per cent to 96 per cent as shown in Table 16. There were three items--8, 4, and 10--that were too easy; the ratings were 96 per cent, 94 per cent, and 94 per cent, respectively. Perhaps item 18 (34 per cent), 23 (32 per cent), and 25 (24 per cent) were too difficult, especially number 25. In fact, in item 25 only 25 per cent chose the correct response.

TABLE 16

Items in Sequence by Difficulty Rating: A Comparison of
Final and Preliminary Administrations

<u>Final Administration</u>		<u>Preliminary Administration</u>	
Item #	Difficulty Rating	Item #	Difficulty Rating
8	.9643	B16	.7982
4	.9408	A11	.8750
10	.9405	A9	.7692
2	.8545	A7	.8846
12	.8521	A18	.7115
7	.8503	A5	.7981
16	.8452	A17	.6731
11	.8434	B24	.7431
3	.8214	A22	.8750
14	.8118	A21	.6827
24	.8107	A12	.5534
21	.8024	A25	.5769
5	.7988	B22	.8796
27	.7738	A8	.5096
13	.7619	B23	.6789
1	.7485	B12	.8899
19	.7202	A6	.6250
9	.7055	A24	.7981
26	.7024	B9	.5138
28	.6765	B8	.4815
20	.6686	B17	.5596
15	.6529	B10	.6422
6	.6228	A1	.8077
33	.5774	---*	---*
31	.4940	B51	.3486
29	.4824	A13	.4519
17	.4821	A3	.5673
22	.4611	A10	.5577
32	.3988	A14	.3077
30	.3929	A20	.2212
18	.3373	B18	.6422
23	.3190	B25	.6055
25	.2412	A15	.5146

* Item 33 was constructed following the preliminary administration.

There are several possible reasons for the responses to item 25. The subject was asked to FIND THE PICTURE OF THE CHILD WHO IS SHOWING OPPOSITION IN ARMS AND LEGS WHILE RUNNING. Response number 1 does show better running form but does not show opposition. Perhaps opposition is too difficult a concept for first-grade children to grasp. It is possible that the examiners, when reading the statement, placed more emphasis on "running" than on "opposition in arms and legs." The objective which prompted this question was stated as follows: "The child should be able to know the criteria necessary for an efficient run" (Logsdon and Barrett, 1969, p. 10). The question may ask for more analysis than knowledge of criteria.

Items of 50 per cent difficulty tend to provide a test with the best validity (Flanagan, 1939; Gronlund, 1968). The 50 per cent difficulty level is supported by Barrow and McGee (1971, p. 397); they stated: "Items with Difficulty Ratings of 50 per cent are most desirable because they also discriminate maximally. The Difficulty Rating for the entire test should be around 50 per cent." Carver (1975) pointed out that the recommended 50 per cent difficulty level is directed at good psychometric tests (those that best sort individuals and whose scores have high validity for individuals taking the test). In contrast, for a criterion referenced test where the items are accurately chosen to reflect the objectives and if instruction is effective, the difficulty ratings would appropriately be low; most subjects should correctly answer the items. The criterion of 50 per cent difficulty should not be used exclusively to eliminate either difficult or easy items without looking first at their centrality to the objectives. Carver (1975, p. 79) stated:

On an achievement test developed by traditional psychometric principles, approximately 60 per cent of the items will be answered correctly. Items that all students get correct are automatically eliminated during the development of the test. Even though these items are likely to be the best for measuring achievement, they are discarded because they do not discriminate among individuals. Thus, it is easy to see that a good test developed under prevailing psychometric principles is likely to be a poor achievement test, but it is excellent for maximizing the variance between individuals.

Anastasi (1968) mentioned that the principal reason for assessing item difficulty is to discard items which have an inappropriate difficulty level. If no one chooses the correct answer for an item or if everyone answers it correctly, the item is unacceptable. Items of this nature fail to supply information about individual differences. According to Vaughn (1951), Tinkelman (1971), and others, the major factors which affect item difficulty are the type of behavior required of the person taking the test, the type content, and the composition of the group--whether homogeneous or heterogeneous. Unusual vocabulary or awkward sentence structure often influence the response.

Index of Discrimination. Table 17 shows a comparison of the discriminatory indices of the items used in both administrations of the test. The criterion for an acceptable index of discrimination is above .19; between .15 and .19 is questionable. If the index falls below .15, the questions should be revised or deleted. Five items whose indices of discrimination fell below .20 were revised for the final test. Table 17 shows this information and reveals that in four cases (11, 16, 30, and 31) discrimination increased; item 8 decreased in the

TABLE 17

Items in Sequence by Indices of Discrimination:
A Comparison of Final and Preliminary Administrations

<u>Final Administration</u>		<u>Preliminary Administration</u>	
<u>Item</u>	<u>Discrimination</u>	<u>Item</u>	<u>Discrimination</u>
<u>Number</u>	<u>Indices</u>	<u>Number</u>	<u>Indices</u>
28	0.6015	B8	0.7188
5	0.5517	B22	0.2188
21	0.5321	A25	0.6097
6	0.4892	A1	0.4505
27	0.4590	A8	0.5108
31	0.4516	B15	0.1563
13	0.4420	B23	0.3438
12	0.4118	A18	0.3828
14	0.4028	A21	0.4452
26	0.4018	B9	0.3438
32	0.3988	A14	0.6355
33	0.3679	---*	---*
23	0.3596	B25	0.4375
19	0.3350	A6	0.6763
17	0.3300	A3	0.6742
22	0.3300	A10	0.6097
15	0.3091	B10	0.2188
16	0.3048	A17	0.0860
30	0.3044	A20	0.1054
2	0.3012	A7	0.2258
9	0.2672	A24	0.3538
11	0.2655	B24	0.1875
1	0.2396	B12	0.2188
24	0.2316	A12	0.4785
7	0.2237	A5	0.3860
20	0.2084	B17	0.4375
4	0.1961	A11	0.2581
3	0.1728	A22	0.2570
10	0.1426	A9	0.3204
8	0.1176	B16	0.1875
29	0.0209	B13	0.4441
25	0.0189	A15	0.2806
18	-0.1967	B18	0.2812

* Item 33 was constructed following the preliminary administration.

ability to discriminate at the acceptable level and perhaps should have been discarded. In the final test, items 3, 8, 10, 18, 25, and 29 failed to discriminate above the .19 level. Number 18 discriminated negatively, -0.1967 . The coefficients ranged from .0189 to 0.6015 for all other items. Twenty items discriminated above .30; six additional items fell within the acceptable criteria. Twelve items increased in discrimination while 20 items decreased. One item was constructed following the first administration of the test, thus making it impossible to make a comparison.

Based on the total of 33 items, it would appear that the index of discrimination was satisfactory since approximately two-thirds of the items discriminated above .30. An examination of the difficulty ratings (Table 16) reveals that the children scored above 50 per cent on 23 of the 33 items. Because the children were successful on most of the items, the discrimination index could not achieve its maximum because the index of discrimination reaches its maximum when the difficulty level is 50 per cent.

For the purpose for which the test was intended, which was making judgment on the effectiveness of the group as a whole, the test is adequate. It discriminated between the ones who knew and those who did not. The difficulty rating was high but acceptable, and the results indicated that the children were successful in meeting the stated objectives.

Other Statistical Analyses

Subpurposes of the final study included the testing of two hypotheses. A comparison between the mean test scores of boys and girls was

made and a comparison between the mean test scores of North Carolina school children and Oklahoma school children. Because of the small number of second-grade participants, no hypothesis concerning grades was tested and the hypothesis about North Carolina and Oklahoma was substituted.

The descriptive statistics necessary to implement test procedures for the above hypotheses (see Table 18 below) reveal that the two-sample t-tests were inappropriate. The assumptions of normality were fulfilled for both hypotheses; however, the requirement of equal population variances could not be satisfied. Consequently, the t' procedure, presented in Engineering Statistics by Bowker and Lieberman, pp. 240-242, was employed to compare the population means. When the null hypothesis H_0 is true, the test statistic t' has an approximate t distribution.

TABLE 18

Summary of the Data Used to Test the
Hypotheses Posed for the Final Administration

Group	Number	Variance	Mean	t
Sex				
Boys	90	17.3609	22.1444	.29
Girls	80	24.6163	21.9375	
States				
Oklahoma	120	26.0218	21.9417	.59
North Carolina	50	7.9694	22.3000	

Hypothesis 2: There will be no significant difference
in the cognitive scores of North Carolina
school children and Oklahoma school children.

Because there was no a priori evidence to indicate that boys would score significantly higher than girls and vice versa, or that North Carolina children would score significantly higher than Oklahoma children and vice versa, the two-tailed test was employed for both hypotheses.

Hypothesis 1: There will be no significant difference
in the cognitive scores of boys and girls.

Upon substitution into the formula for the test statistic, $t' = .29$ was found. Since H_0 is accepted unless $|t'| > t_{\alpha/2, df}$ where α is the level of significance, we accept H_0 for any reasonable value of α and conclude that the mean test scores for the two populations do not differ significantly.

Hypothesis 2: There will be no significant difference
in the cognitive scores of North Carolina
school children and Oklahoma school children.

Again, a two-tailed test was used. The test statistic was computed and $t' = .59$ was found. Therefore, H_0 is accepted for all reasonable values of α , and we conclude that there is no significant difference in the mean scores for boys and girls.

Summary

The results of a preliminary administration of two forms of a test consisting of 25 items each were used for the reconstruction of one test form. The reconstructed instrument contained 38 items to be reviewed by a panel of experts. The feedback provided by the

members of the panel resulted in the deletion of five items and the retention, with suggested revisions, of the remaining 33 items.

The Kuder-Richardson Formula 20 yielded a reliability coefficient of .7334, which was considered satisfactory. Internal validity was determined by use of a Flanagan's Item Analysis. Results were respectable based on the difficulty index, index of discrimination, and the functioning of items. The results of the two hypotheses led to the conclusion that there was no significant difference in the cognitive scores of all boys and all girls taking the final form of the test, nor was there a significant difference between the scores of the children in the two states where the test was administered.

CHAPTER V
DISCUSSION, CONCLUSIONS
AND RECOMMENDATIONS

The initial purpose of this study was to construct an instrument to assess knowledges and understandings of the content of physical education at the primary level, kindergarten through grade three. "Ready? Set... Go!" a television course for elementary school physical education/Level One, was chosen as the program material on which the instrument would be based. A second intent was to establish the validity and reliability of the instrument. Subpurposes involved several hypotheses. In the preliminary study, the hypotheses were concerned with the differences in the scores of boys and girls and of first- and second-grade children. The final administration of the test compared the scores of boys and girls and the scores of the children in the two states which participated in the study.

The literature was reviewed in four areas. The areas related to the cognitive development of the child, physical education for the elementary school, and television instruction were discussed in the review of literature. The information in the area of test construction was primarily incorporated into the procedure.

The procedure involved several processes. The cognitive objectives found in the television series were classified according to Bloom's Taxonomy of Educational Objectives: Cognitive Domain. A table of specifications was constructed. Test items were designed

and divided into Forms A and B, consisting of 25 items each, to be used in the preliminary phase of the study. Reliability was determined by use of the Kuder-Richardson Formula 20. Using the statistical data compiled from Flanagan's method of item analysis, the items meeting the criteria for acceptance were retained. The remaining items were revised or discarded, depending on the nature of the findings. The instrument was reconstructed into a 38-item test for review and judgment by a jury of experts. Using the comments and suggestions by the members of the jury, 33 items were selected for the final instrument. Necessary revisions and adjustments were made in the test items and the test instructions. Test booklets and the examiner's manuals were printed for the final administration of the test. The test was in pictorial form and was group-administered.

In the preliminary phase of the study, Forms A and B of the test were administered to 213 first- and second-grade children in eight schools in North Carolina. The Flanagan method of item analysis was used to determine internal validity. An examination of Forms A and B collectively revealed that all choices of 35 of the 50 items functioned adequately. One choice in 12 items functioned below the 3 per cent level; two choices in the remaining three items failed to meet the specified criterion. The difficulty rating ranged from 96 per cent (easy) to 6 per cent (difficult). Only two items failed to fall between the 10 per cent and 90 per cent criterion set as an acceptable difficulty rating. Twelve items failed to discriminate above the chosen .19 level. The items which did not meet one or more of the specified criteria were either discarded or revised and retained to

be used in the reconstruction of the instrument. Form A of the test yielded a reliability coefficient of .6579; the reliability for Form B was .3400. A t-test of significance of difference supported the null hypothesis that there would be no significant difference in the cognitive scores of the boys and girls taking the test. A t-test was also used to test the hypothesis which compared the cognitive scores of the first- and second-grade children. The null hypothesis was rejected at the one per cent level of significance and it was concluded that second-grade children scored significantly higher than first-grade children. The reconstructed instrument contained 38 items which were reviewed and judged by the members of a jury of experts. There was agreement by the jury members in their choice of the correct response in 27 of the 38 items. From the remaining 11 items on which there was not unanimous agreement, six additional items were chosen and retained for the final instrument. Necessary revisions were made and the 33 items comprised the final test.

The final instrument was administered to 159 first- and 11 second-grade children in two states. The reliability coefficient yielded by all pupils was .7334. The item analysis revealed that all choices in 23 of the items functioned. One choice in eight items and two choices in two items failed to function according to the acceptable criterion of three per cent. Three items were too easy; all other items fell between the 19 per cent and 90 per cent criterion. The most difficult item received a rating of 24 per cent. An examination of the index of discrimination revealed that 27 items of the 33 items discriminated

above .19, which was the criterion chosen for acceptance. Thus, six items failed to discriminate between the children who performed well on the test and those who did not.

Two hypotheses were posed for the final administration of the test. They involved the testing of the significance of difference in the scores of the children in the two states involved and in those of the boys and girls taking the test. The two-tailed t' -test and a t -test, respectively, of the significance of difference supported the H_0 that there was no significant difference in the mean scores involved in the two respective groups.

Discussion

The discussion will include items related to the review of literature, procedure, and findings. There were specific points in each of these areas which need elaboration and explanation. The discussion will be guided by the items in the delimitations cited in Chapter I and the steps involved in test construction in Chapter III.

The nature, breadth, and involvement of the study required an extensive review of the literature. There was an abundance of material in the areas of the cognitive development of the child and in movement education. Studies related to assessing cognitive learning in primary children, especially in physical education, were minimal or practically nonexistent. There were numerous instructional television programs in various subject areas at the primary level. Only one television program in physical education was available for national viewing. Several others were for local use only. "Ready? Set... Go!" was the one National Instructional Television program.

During its first few years "Ready? Set... Go!" was televised by 36 educational networks across the nation. The number of users constantly decreased until at present only four networks reported its use. According to National Instructional Television personnel, programs which are not revised and updated generally lose their effectiveness and become obsolete.

Because of the decrease in the number of users each year during the process of this study, identifying participants in the program was quite difficult. This factor limited the size of the sample available for the study, especially for the final administration of the test. It had been hoped that the sample would be much larger. Also, the difficulty in locating participants made it necessary to alter plans for an intermediate administration of the test. The additional feedback from a second administration of the test prior to the final administration could have resulted in a more valid and reliable test.

As a result of the questionnaire submitted to those participating in the use of the program, it became evident that the "Ready? Set... Go!" series was not being utilized as the authors and designers of the program had intended when it was originally planned. It was intended that the children should participate weekly in the presence of television and that there should be at least one follow-up lesson per week.

The questionnaire used to identify participants who met the stated criteria of the program revealed that the program was being used in a variety of ways. Teachers and children viewed the program in one room and then conducted the lesson in another area of the school. In other

situations, teachers, but not the children, viewed the program and then implemented it elsewhere. Some teachers were using the series less than once a week. For some teachers, there was no television reception or the reception was so poor as to make it impossible for anyone to view the lessons. Several teachers were using the teacher's manual as their only resource. These and other factors compounded the problem of finding situations which met the stated criteria. No situation meeting all the criteria was identified for the final administration of the test. Therefore, the children taking the test had not had the full benefit of the program. These facts could ultimately affect the degree of cognitive learning gained from the experience, thus affecting the results of the test.

The review also revealed a limited number of studies assessing the effectiveness of television instruction. Based on the results of this study and an examination of the data from the test administration, "Ready? Set... Go!" seemed to be effective as a television instructional program. The results revealed that children did learn and the cognitive objectives of the series were partially met.

The objectives of some of the content items were difficult to test using items in pictorial form. Thus, all content areas of the program were not represented in the table of specifications and were not included in the test. The test, then, was not an exact measure of whether cognitive objectives were being met. An example would be the time, space, and flow elements of the effort component. Also, the use of general and personal space could not be represented in a drawing since still pictures were used.

Throughout the study, emphasis was placed on the "natural situation" involved. Since this approach was taken, no effort was made to select individual children from the various classrooms. Groups were kept intact, regardless of mental ability, learning disabilities, listening skills, or other factors which might have been identified. In most studies persons with identified learning problems probably would have been eliminated from the testing situation. One teacher involved in the final administration of the test identified five children in her group whom she considered as deviating from the norm. The scores of the five ranged from 7 to 24 out of a possible score of 33. The child identified as having a learning disability scored 24; three educable mentally retarded children scored 9, 7, and 16; and one child who had entered school only one month prior to taking the test scored 15. There was another score of 7 among the children taking the test, but the child was not identified as having a particular problem. Since teachers had not been requested to eliminate any children from the testing situation or to identify children in any way, the test scores of all children were used.

Tests usually produce better validity and reliability if a specified number of children are selected randomly from various classrooms rather than entire classroom groups. The "natural situation" usually involves all of the children in a classroom. Because of the natural setting the test was not administered in a controlled situation, even though the examiners were asked to make every effort to prevent interruptions. Distractions and environmental factors could alter reliability and validity.

Another factor related to the natural setting was the fact that the individual classroom teachers read the instructions and item statements. Variations in the presentation of the materials--such as speed in reading, pronunciation, and attitude--could have affected the results.

The process of artistically designing the test items for children at the primary level presented problems not normally encountered in designing tests at a higher educational level. With more experience in designing items in pictorial form, several steps might have been saved. Items designed for the preliminary test and retained for the reconstructed and final forms of the test might have been sharper had it been possible to use them in their original form. The writer felt that the art work in the first instrument was clearer and the lines more distinct. The amateur artist, however, had shaded portions of the pictures. The printer and other persons examining the test thought it wise to remove some of the shading. In an effort to remove the shading and to adjust the pictures in some items, it was difficult to maintain the clearness. Also, shading was needed in order to meet the ethnic requirement. The shading and erasures were either not picked up on the copy machine or were picked up as smears. Also, since the artist was not well versed in the area of movement and models or pictures were not as plentiful as might have been desired, it was somewhat difficult to get a true representation of the concept being tested.

The artistic work on the original instruments was much better than the drawings on the reconstructed instrument. In addition,

following the review and judgment by the jury, adjustments in some of the choices and items necessitated erasures which also affected the clarity of the picture. This explanation possibly accounts for some of the changes in the results of the item analysis in the areas of difficulty rating, discrimination, and functioning of responses. Choices in items had to be rearranged for the final instrument in order to alternate the location of the correct response so as to prevent excessive repetition of the same choice in the key. More experience in test construction, especially of an instrument of the pictorial type, could simplify the process to a great extent and minimize the time and expense involved.

The responses from teachers who participated in the study were positive. Comments indicated that the children enjoyed taking the test. Some thought of it as a game. Teachers expressed regret that they did not have the answer key so they could score the test before it was returned.

The procedure used in the construction of the instrument for this study included the review of the instrument by individuals knowledgeable in the area of test construction. This procedure was used to determine curricular or empirical validity. Eleven persons agreed to assist in reviewing the instrument. Ten members of the jury returned the materials and provided helpful feedback in the requested areas: subject matter, which involved checking for accuracy and appropriateness of subject content and the matching of objectives to the test items; the technical merits of the test; and the editorial quality. The comments and suggestions made by these individuals were

used in the final revision of the test. Several of these comments were cited in Chapter III. This discussion will focus on the review and judgment of the members of the jury whose responsibility was in the subject matter area. The content or subject matter areas were outlined and diagrammed on page 6 of the "Ready? Set... Go!" Teacher's Manual. The content items reflected the components and elements of movement based on Laban's theory of movement. The content items were placed in chart form and sent to the jury to aid them in making their decisions.

Several objectives included more than one content item. At times it was difficult to identify some of the specific content terms with the broad content areas or sub-areas. Questions were raised concerning several of the items. The use of the term "space" several times in the charting of the content areas caused concern and confusion on the part of one member. There was, however, general agreement on the part of the members concerning the matching of objectives to test items.

Two members of the jury identified problems relative to perception in a test designed in pictorial form. One member asked a question to this effect: How do you plan to handle the fact that this might be a test for perception and not cognition? This problem was identified in Chapter I as a delimitation of the study. Also, in the review of literature, Chapter II, the discussion included involving perception in the cognitive development of the child. In the interpretation of the results, there was no way of knowing whether the choice of the answer was based on perception or cognition.

To summarize the discussion of the results of the review and judgment by the jury of experts, statements by two of the members are cited. These statements reflected support of the instrument and at the same time raised some questions. In the first excerpt from the letter, the perceptual factor was identified.

Lolas Halverson (January 9, 1975), University of Wisconsin at Madison, stated:

In general, you have done well in attempting to select pictorial items which ought to secure cognitive and perceptual responses in children. The attempt to picture movement through still photos or drawings is a very difficult one. I think such attempts require a fairly astute interpretation on the part of children since they really must infer previous and future action on the basis of only one picture sample. I find it difficult to predict how well a 6 or 7 year old can do this, and whether what they "see" in a picture would be any where near what adults "see" in it. Perhaps your study will help with this. If a child fails to select one correct picture or pictures in your test items, it would be very interesting to know why they chose what they did.

The television teacher for the "Ready? Set... Go!" series, Jane Young (December 19, 1974), who teaches at the University of South Florida at Tampa, wrote:

I think the concept the pictorial test is exciting. First of all, it is difficult sometimes to determine whether or not the children are "moving" as opposed to showing "a shape." For the most part I think you have solved this problem very well, but there are one or two places where I have noted this difficulty on the sheet.

Items and findings related to the internal or statistical validity of the test instrument resulting from the item analysis, the reliability, and factors affecting each were incorporated in the discussion of the results in Chapter IV.

Conclusions

The procedures used in this study for determining validity and reliability of a test instrument were those recommended by authorities in test construction. The following conclusions have been drawn:

1. The test instrument appeared to have satisfactory validity and reliability.
2. The scores of boys and girls on the test did not differ significantly.
3. The scores of North Carolina children and Oklahoma children on the test did not differ significantly.

Recommendations

The group-administered paper-and-pencil test designed in pictorial form seems to be a viable type instrument for primary grade children. The writer therefore recommends the following:

1. Additional paper-and-pencil instruments of the pictorial type should be constructed to assess knowledges and understandings of physical education at the primary level.
2. An attempt should be made to use some type of visual presentation of the items so that the concepts requiring movement can be represented in the test.
3. The influence of perception on the cognitive choices made by the children should be explored.

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APPENDICES

APPENDIX A
MATERIALS RELATED TO
NATIONAL
INSTRUCTIONAL
TELEVISION

October 12, 1970

Mr. Saul Rockman
National Instructional Television Center
Box A
Bloomington, Indiana 47401

Dear Mr. Rockman:

Earlier in the summer Kate Barrett of the University of North Carolina at Greensboro, co-author of "Ready? Set... Go!" teacher's manual, contacted National Instructional Television concerning the possibility of funds being available to help defray expenses involved in a doctoral dissertation.

The purpose of the dissertation is to develop instruments for assessing cognitive learnings--knowledges and understandings--based on the material in Level One of the course. The instruments will involve forms of paper-pencil tests employing the use of some visual aids and possibly other instructional media.

Georgia, or a similarly located state, will probably be used for the pilot study with the final administrations of the tests taking place in Wisconsin, California, and Hawaii. I shall probably have to observe the program in operation in several of these places and make personal contacts with responsible persons in the general area. There will be correspondence involved plus materials for final printing of tests. Other expenses will include photography in the nature of slides, filmstrips, and other visual materials.

The tentative time table is as follows:

1. Initial work to begin in the summer of 1971
2. Preliminary administration by Kate Barrett in a Greensboro school - spring of 1972
3. Evaluation of preliminary study
4. Pilot study in fall of 1972
5. Evaluation of pilot study
6. Final administration - spring of 1973

Mr. Rockman

page 2

I will be glad to send you additional information concerning the project at your request and as the dissertation develops. I will appreciate any consideration that can be given this request and would like to hear from you at your earliest convenience.

Sincerely,

Virginia Hart
Doctoral Candidate

Rosemary McGee
Dissertation Adviser

VH:jst



October 23, 1970

Miss Virginia Hart
Mars Hill College
Mars Hill, North Carolina 28754

Dear Miss Hart:

Nit is pleased that you are considering a dissertation project involving the effects and the effectiveness of "Ready? Set...Go!" I am interested in learning more about the specific goals of the dissertation and some of the rationale for the project to be undertaken. I understand that it may be quite early in your dissertation activities to have completed a full proposal, but I would appreciate the opportunity of viewing the proposal when it becomes available.

NIT's involvement in research and formal evaluation activities is increasing but still rather new. At the present time, it is felt that assistance and support could be provided to you by NIT in three areas. First, financial assistance would be available, on a level to be determined, in order to defray the expenses incurred in this study. The budget, of course, is contingent upon the design of the dissertation and the extensiveness of the activities you select to undertake. The second area of assistance is in the area of personnel. NIT has regional offices in Washington, D.C., Milwaukee, and on the West Coast. The professional staff of these regional offices would be able to assist you in making personal contacts with the appropriate sources of power, in distributing and collecting data and data generating materials, and in serving as resource and advisory sources, as they have had wide experience with the actual classroom use of "Ready? Set...Go!" The third area of assistance would be in the availability of materials generated in the production phase of "Ready? Set...Go!" There exists a large collection of still photographs of the studio activities, some of which may be useful for your study (an assumption), and some video tapes of classroom use of "Ready? Set...Go!"

October 23, 1970

Miss Virginia Hart
Page 2

At the present time, NIT would consider assisting you by any or all of the ways listed above. The degree to which each of these forms of assistance could be implimented depends on a more complete understanding of the activities you wish to undertake.

A factor which might make a difference in the time table you propose is the possibility that the state of North Carolina may be using "Ready? Set...Go!" during the upcoming school year. Another bit of information that may be of some use is the enclosed map and list of current users of the telecourse.

I am looking forward to hearing about your dissertation project in more detail so that whatever assistance we can provide will be of maximum benefit to you and to diffusion and utilization of "Ready? Set...Go!"

In peace,



Saul Rockman
Research Associate

SR/rc
cc: Kate Barrett

1613 West End Place
Greensboro, N. C. 27403

June 8, 1973

Mr. Saul Rockman
National Instructional Television Center
Box A
Bloomington, Indiana 47401

Dear Mr. Rockman:

Even though the schedule has been altered somewhat since first contacting you in 1970 my plans to develop instruments for assessing cognitive learnings based on the material in Level One of the "Ready? Set... Go!" Series remain the same.

This time I have begun work on the dissertation proposal and the first draft of the instruments, hoping to have these ready for my committee's consideration by the last of August or early September.

I will need to begin contacting persons involved in the "Ready? Set... Go!" Series requesting assistance in this project. Could you send a current map showing the locations and a list of the contact person in each state? If there is any other pertinent information which I might need to get under way I shall appreciate your sending it.

I look forward to hearing from you and appreciate your assistance in this matter.

Sincerely,

Virginia Hart
Doctoral Candidate

Rosemary McGee
Dissertation Adviser



June 25, 1973

Virginia Hart
1613 West End Place
Greensboro, North Carolina 27403

Dear Ms. Hart:

I'm pleased to hear of renewed activity on your dissertation. I've enclosed a list of the 1972-1973 users of "Ready, Set, Go!"; the 1973-1974 users aren't yet known, but are likely to be the same. The people listed for each state or local agency are those in a position to assist you, or can get you to the right person. If you want to mention the consent of NIT in your project, and I assume NIT approval will be freely given, go right ahead.

At some time in the future, we would like to see your proposal, so if we are called we can knowledgeably respond.

Best of luck.

Sincerely,

Saul Rockman
Research Associate

SR/ks
Enclosure

January 2, 1974

Mr. Saul Rockman
Research Associate
National Instructional Television Center
Box A
Bloomington, Indiana 47401

Dear Mr. Rockman:

On December 6, 1973 my dissertation proposal was approved by the committee and filed in the graduate office. A copy accompanies this letter.

In the mean time work on the instrument has progressed in preparation for the pre-tryout test which I hope to administer to a small group in North Carolina in January or February, 1974. The artist has drawn 51 items which will be used to construct parallel forms of the test to be used in the pre-tryout administration.

In preparation for the final administration, my plan is to make contacts with the appropriate persons in California and Hawaii in April while I am on the West Coast for the American Association for Health, Physical Education, and Recreation (AAHPER) Convention.

Please send a list of the 1973-74 users of "Ready? Set... Go!" One question: does the fact that the 1972-73 list did not include some of the users found on the 1971-72 list mean that those not listed again are no longer users? If so, does this mean that the program is no longer used in Hawaii? If this is true it will be necessary to choose another state in its place for the final administration; I hope not.

After you have reviewed the proposal would it be possible to give me some additional information regarding NIT's assistance in this project especially relating to the financial aspect.

Mr. Saul Rockman

page two

January 2, 1974

I shall be looking forward to a response and to your reaction to the proposal. When the two test forms are completed I shall send copies and would appreciate your comments before I begin reconstruction of the instrument.

Sincerely,

Virginia Hart
Doctoral Candidate

Rosemary McGee
Dissertation Adviser

VH:zh

Enclosure

APPENDIX B
MATERIALS RELATED TO
NORTH CAROLINA
ADMINISTRATION
OF THE TEST

To: Helen Stuart and Rheta Richarson, Coordinator
and Consultant, "Ready? Set... Go!"

From: Virginia Hart, Doctoral Candidate, UNC-Greensboro

Re: Dissertation: "Ready? Set... Go!"

Date: August 28, 1973

I plan to construct a paper-and-pencil test to assess cognitive learnings based on "Ready? Set... Go!" This is to be my dissertation in completion of the requirements for the Ed. D. degree at the University of North Carolina at Greensboro. The main purpose of the study is to validate the "Ready? Set... Go!" program by determining if the cognitive objectives are being met.

My intent would be to administer a pre-tryout test in late fall, 1973, in schools that were represented by the teachers in the 1972-1973 Wilkes and Burke County workshops. I plan to ask the assistance of Joan Askew, Larry McDonald and Melvin Ruggles who directed the workshops. The test would be administered to a sample of children who participated in "Ready? Set... Go!" in 1972-1973 and who at that time were in kindergarten or first grade.

Also, I would like to do the pilot study in North Carolina in the spring of 1974. The test should be administered to first and second grade children who will be involved in the program during the 1973-1974 school year. There is the need for a similar control group composed of children not participating in "Ready? Set... Go!"

The purpose of this letter is to request permission to do the pre-tryout and pilot studies in North Carolina and to make the initial contact with the teachers through the directors of the 1973-1974 "Ready? Set... Go!" workshops.

Would it be possible for me to have a few minutes at the September 14-15 orientation workshop at UNC-G? I would like to request the assistance of those involved and give them information to distribute to the participants in their workshops.

It would please me a great deal if the test could be administered in North Carolina. I shall appreciate your support in this effort and look forward to a response.

Note: The dissertation proposal has not yet been presented to my committee; however, it is in the hands of the chairman. I am hoping that a meeting with the committee can be scheduled during the same week of the "Ready? Set... Go!" workshop at UNC-G and that I can have necessary materials available at that time in anticipation of their approval.



State of North Carolina

Superintendent of Public Instruction

Raleigh 27602

A. CRAIG PHILLIPS
SUPERINTENDENT

JEROME H. MELTO
ASSISTANT
SUPERINTENDENT

September 5, 1973

Miss Virginia Hart
Box 431
Dept. of Health and Physical Education
Mars Hill College
Mars Hill, North Carolina 28754

Dear Miss Hart:

Miss Helen Stuart has discussed your research project to validate the "Ready? Set - Go" program objectives with Dr. H. T. Conner, Assistant State Superintendent for Research and Development and me. We commend you on this study and are happy to give our endorsement and support.

I would suggest that you contact the superintendents in the counties involved and explain the project to them.

Sincerely,

A handwritten signature in cursive script that reads "George A. Kahdy".

George A. Kahdy
Deputy Assistant Superintendent
for Program Services

GAK:pev

To: Directors of the 1973-74 "Ready? Set... Go!" workshops

From: Virginia Hart, Department of Physical Education, Mars Hill College, Mars Hill, North Carolina 28754

Re: Assistance with dissertation plans

Date: September 14, 1973

I plan to construct a paper-and-pencil test to assess cognitive learnings based on "Ready? Set... Go!"/Level One. This is to be my dissertation in completion of the requirements for the Ed. D. degree at the University of North Carolina at Greensboro. The main purpose of the study is to validate the "Ready? Set... Go!" program by determining if the cognitive objectives are being met.

The Department of Public Instruction has already given its endorsement and support both for pre-tryout and pilot studies to be administered in North Carolina.

Plans are to administer the pre-tryout to a small sample in four western counties in the late fall, 1973, and to conduct a more extensive study in the spring of 1974. An attempt will be made to select a geographical representation by counties across the state. The test will be administered to children in classes of teachers who will be chosen randomly from those participating in the program during the 1973-74 school year.

A corresponding control group of students who have not experienced "Ready? Set... Go!" will be needed and will be determined by a selection of parallel teachers in the same schools represented above.

I am asking your assistance in identifying your workshop participants who will be using Level One as it was originally intended--children viewing television as they participate.

Could you take time in your first workshop to have the participants complete the forms requesting the desired information, and would you return them to me as soon as possible? I shall reimburse you for postage. Will you please enclose a receipt from the post office for my records?

Your help and cooperation in this endeavor will be deeply appreciated.

TO: Teachers of kindergarten and first grade who were participants in the 1972-73 "Ready? Set... Go!" workshops or were users of the "Ready? Set... Go!" Series/Level One

FROM: Virginia Hart, Department of Physical Education, Mars Hill College, Box 431, Mars Hill, North Carolina 28754

RE: Assistance with doctoral dissertation

DATE: March 6, 1974

I plan to construct a paper and pencil test to assess cognitive learnings based on "Ready? Set... Go!" - a television course for elementary physical education/Level One. This is to be my dissertation in completion of the requirements for the Ed. D. degree at the University of North Carolina at Greensboro. The main purpose of the study is to determine if the cognitive objectives are being met.

Your name has been given to me by the director of the 1972-73 workshop in which you were a participant. The information which I received indicated that your kindergarten or first grade children were involved in the "Ready? Set... Go!" Series during the 1972-73 school year. At present, these children would be in first or second grade and would meet the grade criterion needed for the pre-tryout administration of the test.

Your assistance is needed and will be deeply appreciated. I realize that you probably do not teach these children this 1973-74 school year. However, it is possible that you might have access to the children or might identify them and ask the person who is presently their teacher to assist in administering the test.

Two test forms have been constructed--Forms A and B. You will be asked to administer only one form of the test to your 1972-73 children who participated in "Ready? Set... Go!"; therefore, all groups of children will not be administered the same test.

Accompanying this letter is a form to be completed and a stamped self-addressed envelope for returning the requested information. Please complete and return at your earliest convenience. I would like to complete the pre-tryout by the end of March if at all possible.

Thank you for your cooperation.

TO: Health and/or Physical Education Coordinators and
Superintendents in the school systems in North Carolina

FROM: Virginia Hart, Department of Physical Education, Mars
Hill College, Mars Hill, North Carolina 28754

RE: Assistance with doctoral dissertation

DATE: March 15, 1974

I plan to construct a paper-and-pencil test to assess cognitive learnings based on "Ready? Set... Go!" a television course for elementary physical education/Level One. This is to be my dissertation in completion of the requirements for the Ed. D. degree at the University of North Carolina at Greensboro. The main purpose of the study is to determine if the cognitive objectives are being met.

Your name appears on a list of Health Coordinators sent to me by the State Department of Public Instruction. I need your assistance in identifying and distributing the enclosed questionnaire to the first and second grade teachers in your school system who are using the "Ready? Set... Go!" series during this 1973-74 school year. The information gained from the questionnaire will help locate the teachers whose situation meets the necessary criteria for administration of the test.

I am enclosing ten copies of the form in hopes that you might be willing to help me with this matter. I assume that ten copies will be sufficient; if not, it is possible that two in the same school might share a form or duplicate it. Also, enclosed is a self-addressed sticker to make it possible for you to use the same envelope for returning the completed forms. You might prefer having the teachers return them directly to me. Either way will be satisfactory. Please return or have them returned at your earliest convenience.

Might I assume that providing your assistance will also indicate your willingness to grant permission for the teachers to administer the test to their children? Administration time is estimated at approximately 30-40 minutes. Teachers will be chosen randomly from those meeting the criteria.

If you are not the person in position to identify these teachers, would you please pass the material on to the proper person?

Thank you in advance for your cooperation and assistance.

Information concerning the use of the "Ready? Set... Go!" series/Level One

Please supply the following information:

Your Name _____

School Address _____

Zip _____

Principal's Name _____

Superintendent's Name _____

Business Address _____

Zip _____

Did you use "Ready? Set... Go!" during the 1972-73 school year?

Yes ___ No ___

If the above answer is "No," please refer to the starred (*) item in this form and supply the requested information.

If the above answer is "Yes":

Did you have access to television? Yes ___ No ___

Did the children participate at the time the lessons were being broadcast? Yes ___ No ___

If the answer to either of the two previous questions is "No," please describe the situation.

Did you use the series on a weekly basis as presented in the manual and in the presence of television? Yes ___ No ___

Did you provide weekly follow-up lessons? Yes ___ No ___

If "Yes," indicate the number per week _____.

What grade/grades was/were involved? K ___ 1st ___

How many children were involved? _____

What type room or area was used?

Gymnasium _____ Multipurpose _____ Classroom _____

Other _____

Did the children get any other physical education in addition to "Ready? Set... Go!?"? Yes _____ No _____

If "Yes," indicate the number of days per week. _____

If your situation meets my criteria, would you be willing to cooperate by administering a paper-and-pencil test based on "Ready? Set... Go!" to the children who were 1972-73 users of the series? Yes _____ No _____ (These children would be in the first and second grades during this 1973-74 school year).

*Please supply the names of other teachers in your school who used "Ready? Set... Go!"/Level I in kindergarten or first grade in 1972-73.

Thank you for your assistance.

If you indicated your willingness to participate in this study, please ask the principal to sign this form granting his permission for the test to be administered in the school.

Principal's Signature _____

TO: Teachers of "Ready? Set... Go!", 1973-74 who responded to the questionnaire and whose situation meets the necessary criteria

FROM: Virginia Hart, Box 431, Mars Hill, North Carolina 28754

RE: Administration of a paper-and-pencil test based on the "Ready? Set... Go!" Series/Level One

DATE: May 16, 1974

Thank you for your response to my recent communication and for completing the questionnaire concerning your involvement in the "Ready? Set... Go!" Series/Level One.

Your situation does meet the necessary criteria for administering the test, namely: 1) the children are in first or second grades; they are participating in the presence of the televised program; and 2) at least one follow-up lesson per week is provided.

Your name has been chosen at random from those meeting the criteria and who indicated a willingness to be of assistance by administering the test; however, an attempt has been made to secure a wide geographical representation.

I am enclosing test booklets for the number of children indicated on the form returned by you, a test booklet for you, and two examiner's manuals.

Please administer the test to your children as soon as it is convenient following the completion of the series the week of May 20-24. Return all materials to me at the above address as soon as possible. Stamps are enclosed in the amount of the postage it took to mail the materials to you. Return as educational materials.

In addition to administering the test, I would appreciate any comments, corrections, suggestions, or criticisms concerning the test items themselves and the examiner's manual. Please consider:

1. vocabulary or language appropriateness,
2. content coverage,
3. clarity of instructions and statement of test items,
4. possible additional instructions, or
5. any other points needing special attention.

You may make your comments, corrections, or suggestions in the examiner's manual, in the test booklet, or on a separate sheet of paper.

Thank you for completing and returning the earlier questionnaire and for your willingness to administer the test. Your comments will also be deeply appreciated. Results of the test will be reported to you as soon as the statistical analysis is completed.

VH/mj

APPENDIX C
MATERIALS RELATED TO
JURY

TO: Potential Jury Member

FROM: Virginia Hart, Doctoral Candidate, University
of North Carolina at Greensboro

RE: Reviewing and judging a pictorial paper-and-pencil test

DATE: July 12, 1974

I am in the process of constructing a paper-and-pencil test to assess cognitive learnings based on "Ready? Set... Go!" - a television course for elementary physical education/Level One. This is to be my dissertation in completion of the requirements for the Ed. D. degree at the University of North Carolina at Greensboro. The main purpose of the study is to determine if the cognitive objectives are being met.

Two forms of the test - A and B - were constructed for a pre-tryout and were administered in North Carolina in May, 1974. The data were analyzed and the results used in the reconstruction of the test to be used in the pilot study.

A jury of experts is needed to review and judge the instrument before it is revised for the final administration scheduled for May, 1975. The instrument must be reviewed in the areas of 1) accuracy and appropriateness of subject matter content and the matching of objectives to test items, 2) the technical merits apart from content, i.e., the mechanics of the test, and 3) the editorial quality including punctuation, diction, uniformity of style, language appropriateness and vocabulary. The areas are numbered. Would you serve on the jury in area number ____? If you have any comments in the other areas, please feel free to make them.

It will be deeply appreciated if you would assist me by serving on the jury. Please reply by completing the enclosed card and returning it to me. If your reply is affirmative you should receive the necessary materials in early fall.

Date:

_____ I will serve on the jury of experts.

_____ It is impossible for me to serve on the jury of experts.

Signed _____

Miss Virginia Hart
Box 431
Mars Hill
North Carolina 28754

TO: Jury members responsible for area 1) accuracy and appropriateness of subject matter content and matching of objectives to test items

FROM: Virginia Hart, Doctoral Candidate, University of North Carolina at Greensboro

RE: Reviewing and judging a pictorial paper-and-pencil test

DATE: November 7, 1974

Thank you for replying in the affirmative indicating your willingness to assist me by reviewing and judging the instrument assessing cognitive learnings based on "Ready? Set... Go!"/Level One.

The enclosed multiple-choice pictorial paper-and-pencil test was re-constructed based on the results of the analysis of the data from the pre-tryout test forms. The objectives accompany the test. Please feel free to comment, criticize, add to, or take from each item. This will be of great service. Please mark an X on the answer which in your opinion is most correct. If two answers are equally correct, mark an X on both.

If it will save you some time, the following code may be used in the comment area of the enclosed form. However, this is for your help, and it is immaterial whether you use it or not.

TD -- too difficult for first or second grade children
NC -- statement is not clear
CA -- answers are confusing
SM -- the statement does not measure the stated objective

Any other symbols that you wish may be used.

The following materials are enclosed:

1. An evaluation form: Response Form Related to Content Areas
2. Objectives by items and cognitive levels
3. Condensed form of Bloom's taxonomy-cognitive domain
4. A condensed form of the table of specification
5. An examiner's manual
6. A test booklet

Thank you for your assistance. Please return materials in the same envelope at your earliest convenience. A self-addressed sticker and postage are enclosed. I will send you a copy of the revised test form and the answer sheet.

TO: Jury members responsible for area 2) the technical merits apart from content -- the mechanics of the test

FROM: Virginia Hart, Doctoral Candidate, University of North Carolina at Greensboro

RE: Reviewing and judging a pictorial paper-and-pencil test

DATE: November 7, 1974

Thank you for replying in the affirmative indicating your willingness to assist me by reviewing and judging the instrument assessing cognitive learnings based on "Ready? Set... Go!"/Level One.

The enclosed multiple-choice pictorial paper-and-pencil test was re-constructed based on the results of the analysis of the data from the pre-tryout test forms. Also included are all the materials sent to the jury members responsible for area one -- the content area. It is possible that you might have additional comments in this area and in area three -- the editorial quality.

If it will save you some time, the following code may be used in the comment area of the appropriate form or in the manual and test booklet. However, this is for your help and it is immaterial whether you use it or not.

TD -- too difficult for first or second grade children
 NC -- statement is not clear
 CA -- answers are confusing
 SM -- the statement does not measure the stated objective

Any other symbols that you wish may be used.

Each of you is familiar with the technical merits essential in constructing multiple-choice test questions; however, a few points are included to assist you:

- 1) Multiple-choice questions require some discriminatory thinking.
- 2) The stem should be a complete statement or question.
- 3) Each possible choice should be plausible.
- 4) All choices should follow a parallel structure which is grammatically consistent.
- 5) The choices should all be of about the same length.
(Would this imply that the same number of children should be used in each choice in an item?)
- 6) The answers should follow no pattern.
- 7) There should be an adequate number of plausible choices.

- 8) Each question should have the same number of choices.
- 9) Each choice should be listed separately.
- 10) Questions should be stated in the third person.
- 11) The problem should be simple and concisely presented in the stem.
- 12) Negatively stated questions should be minimal, and care should be taken to emphasize the negative words by underlining them.
- 13) Care should be taken that a question does not give a clue to the answer of some other question in the test. Each item should be independent. (Barrow-McGee, 1971).

Thank you for your assistance. Please return the materials in the same envelope at your earliest convenience. A self-addressed sticker and postage are enclosed. I will send you a copy of the revised test form and the answer sheet.

TO: Jury members responsible for area 3) the editorial quality including punctuation, diction, uniformity of style, language appropriateness, and vocabulary

FROM: Virginia Hart, Doctoral Candidate, University of North Carolina at Greensboro

RE: Reviewing and judging a pictorial paper-and-pencil test

DATE: November 7, 1974

Thank you for replying in the affirmative indicating your willingness to assist me by reviewing and judging the instrument assessing cognitive learnings based on "Ready? Set... Go!"/Level One.

The enclosed multiple-choice pictorial paper-and-pencil test was re-constructed based on the results of the analysis of the data from the pre-tryout test forms. Please feel free to comment, criticize, correct, add to, take from, or rearrange the wording in the examiner's manual or react to the test items themselves. Keep in mind that the test is designed for first and second grades. Please make your comments directly in or on the manual and test booklet. Also included are the materials sent to the jury members responsible for area one - the content area. It is possible that you may have additional comments in this area.

If it will save you some time, the following code may be used in the comment area of the appropriate form or in the manual and test booklet. However, this is for your help and it is immaterial whether you use it or not.

TD -- too difficult for first or second grade children
NC -- statement is not clear
CA -- answers are confusing
SM -- the statement does not measure the stated objective

Any other symbols that you wish may be used.

Thank you for your assistance. Please return the materials in the same envelope at your earliest convenience. A self-addressed sticker and postage are enclosed. I will send you a copy of the revised test form and the answer sheet.

Response Form Related to Content Areas

Broad Content Areas: Quality (How) Awareness (What)
 Space (Where) Relationships (With What)

Sub-Areas Code: 1. Time, 2. Force, 3. Space, 4. Flow, 5. Body
 Awareness, 6. Skill, 7. Space, 8. Direction,
 9. Level, 10. Pathway, 11. Parts of body to each
 other, 12. Individuals and groups to each other,
 13. Individuals and groups to objects

Item No.	Content Area	Agree/ Disagree	Comments
1	Awareness 6		
2	Awareness 5		
3	Relationships 12		
4	Space 8		
5	Relationships 12		
6	Relationships 13		
7	Awareness 6 Relationships 13		
8	Awareness 6		

Item No.	Content Area	Agree/ Disagree	Comments
9	Awareness 6		
10	Quality 2		
11	Space 9		
12	Relationships 13		
13	Quality 4 Awareness 6		
14	Awareness 5,6		
15	Space 9 Awareness 5		
16	Awareness 6 Quality 2		
17	Quality 4 Awareness 6		
18	Awareness 6		

Item No.	Content Area	Agree/ Disagree	Comments
19	Relationships 12		
20	Quality 2 Awareness 6		
21	Space 9		
22	Quality 2 Awareness 6		
23	Awareness 5		
24	Awareness 5		
25	Space 9		
26	Awareness 5		
27	Awareness 6		
28	Awareness 6		

Item No.	Content Area	Agree/ Disagree	Comments
29	Relationships 11		
30	Space 8		
31	Awareness 5		
32	Awareness 5		
33	Awareness 5		
34	Awareness 6		
35	Quality 4		
36	Quality 2 Awareness 6		
37	Awareness 6		
38	Space 7		

Objectives by Items and Cognitive Levels

Item No.	Objective	Cognitive Level
	The child should be able to:	
1	Be familiar with stretch and curl. Be familiar with opposite movements.	1.11
2	Be familiar with body parts.	1.11
3	Be familiar with movement in relationship with a partner (move towards, away...)	1.11
4	Be familiar with direction, different directions.	1.11
5	Be familiar with matching movements.	1.11
6	Be familiar with moving over, moving around.	1.11
7	Be familiar with rebound.	1.11
8	Be familiar with stretch, extending reach.	1.11
9	Be familiar with throw. Recognize the difference in striking and throwing.	1.11 1.23
10	Know that tagging is executed by touching a person lightly...	1.21
11	Be familiar with levels.	1.11
12	Be familiar with moving over, moving around, moving along.	1.11
13	Comprehend that the follow-through of the body part should be executed in the direction of the intended path of the object being propelled.	2.10
14	Be familiar with terms: twisting...	1.11
15	Be familiar with high, low, medium levels; different levels, body shapes.	1.11

16	Know that the force of the kick is derived from the size of the swinging arc (distance traveled) and the speed of the swinging lever (leg).	1.10
	Realize that speed and range are factors are governing force.	1.20
	Comprehend that the follow-through of the body part should be executed in the intended path of the object being propelled.	2.10
17	Be familiar with giving, ability to give.	1.11
18	Be familiar with stretch.	1.11
19	Be familiar with body shapes, opposite movements/shapes.	1.11
20	Be familiar with giving, follow-through and landing.	1.11
	Understand that force is imparted and received in the direction in which it is moving or is to move.	2.10
	Understand that absorption of force should begin immediately after contact is made with the floor.	2.10
21	Be familiar with levels.	1.11
22	Be familiar with force, range of movement.	1.11
23	Be familiar with terms and phrases: body parts...	
24	Understand that to hold one's balance, weight must be evenly distributed over the base of support.	2.10
	Be familiar with balance.	1.11
25	Be familiar with high, medium and low levels.	1.11
26	Be familiar with focus on a spot.	1.11
27	Use (apply) opposition of the arms and legs while running.	3.0
28	Be familiar with focus on a spot.	1.11
29	Be familiar with opposite movements, wide-narrow.	1.11

30	Be familiar with direction, different directions.	1.11
31	Be familiar with outside of foot.	1.11
32	Be familiar with balls of feet.	1.11
33	Understand...positions of center of gravity over base of support; the lower the body is to the floor, the more stable its position, the higher the body is to the floor the less stable its position. Apply the concepts of balance relating to distribution of weight over base of support and position of body in space (high, low) and its stability.	2.10 3.0
34	Be familiar with strike, striking patterns.	1.11
35	Be familiar with moving softly, lightly. (not stated in an objective but found in content)	1.11
36	Be familiar with balance.	1.11
37	Be familiar with giving, ability to give.	1.11
38	Be familiar with movement terms and phrases: traveling using own space and traveling using all space.	1.11

A Taxonomy of Educational Objectives
(Adopted from the work of Benjamin Bloom and David Krathwohl)

COGNITIVE DOMAIN

KNOWLEDGE

1. KNOWLEDGE

Knowledge, as here defined, involves the recall of specifics and universals, the recall of methods and processes, the recall of a pattern structure, or setting.

Vocabulary for stating objectives:

recall, acquire, recognize, identify, repeat, know, define,
be familiar with

SKILLS AND ABILITIES

2. COMPREHENSION

This refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the idea or material being communicated without necessarily relating it to other material or seeing its fullest implications.

Vocabulary for stating objectives:

give in own words, illustrate, prepare, represent, transform,
rephrase, restate, extrapolate, translate, draw inferences,
generalize, summarize, draw conclusions, predict

3. APPLICATION

The use of abstractions in particular and concrete situations.

Vocabulary for stating objectives:

apply, relate, develop, organize, use, employ, transfer

4. ANALYSIS

The breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit.

Vocabulary for stating objectives:

analyze, contrast, compare, distinguish, deduce, classify,
identify elements, detect

5. SYNTHESIS

The putting together of elements or parts so as to form a whole.

Vocabulary for stating objectives:

plan, propose, derive, synthesize, formulate, modify, design,
combine, produce, integrate

6. EVALUATION

Judgment about the value of material and methods for given purposes.
Quantitative and qualitative judgments about the extent to which
material and methods satisfy criteria.

Vocabulary for stating objectives:

judge, argue, validate, assess, decide, appraise, distinguish,
compare (using a standard)

For further information see:

Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain. Benjamin Bloom. Editor. New York: David McKay, 1956.

Condensed Table of Specification

Content		Number of Items Needed	Number of Items in test	Percentage Needed
How the body moves	Quality	11	8	30%
What the body does	Aware- ness	18	17	46%
Where the body moves	Space	5	7	13%
With what relation- ships	Relation- ships	4	6	11%
Total		38	38	100%

APPENDIX D
MATERIALS RELATED TO
OKLAHOMA
ADMINISTRATION
OF THE TEST

RESEARCH APPLICATION TO OKLAHOMA CITY PUBLIC SCHOOLS

Applicant's Name Virginia Hart University University of North Carolina at Greensboro
 Address P. O. Box 431 Mars Hill, North Carolina 28754 Telephone Number (704) 689-2886
 Degree Program Doctor of Education Department Physical Education
 Advisor's Signature _____

TITLE: Construction of an Instrument for Assessing Cognitive Learning Based Upon "Ready? Set... Go!" A Television Course for Elementary Physical Education/Level One

OBJECTIVES: Purposes are: 1) To construct a group-administered paper-and-pencil test for first and second grades to assess knowledges and understandings based on "Ready? Set... Go!"/Level One. 2) To establish the validity and reliability for the instrument. Subpurposes include the testing of two hypotheses: a. There will be no difference in the cognitive learnings between boys and girls. b. There will be no significant difference in the cognitive scores of first and second grade children.

PROCEDURE: (General Design, Population and Sample, Instrumentation, Analysis, Time Schedule, etc.; use back of sheet, if necessary)

The lesson objectives in the cognitive domain included in the "Ready? Set ... Go!" manual have been classified according to levels within the domain using Bloom's taxonomy and a table of specification has been constructed. Only the objectives which can be measured with a group paper-and-pencil test have been included. Test items are designed--in pictorial form--for the purpose of determining whether or not the program as presented in the television series is meeting the objectives for which it was originally planned.

Two test forms - A and B - were constructed for a preliminary tryout. They were administered to children in North Carolina schools following the final lesson of the "Ready? Set... Go!" series in May, 1974. A 5% sample was proposed; however, the results of a questionnaire identified only a small number of teachers/children whose situation met the criteria. In order to have at least 100 subjects for each test form, 58% of those meeting the criteria were used: 104 took Form A; 109 took Form B. Items were evaluated by use of Flanagan's method of item analysis. Reliability was checked by using the Kuder-Richardson Formula 20. The results of the analyses of the data were used in the reconstruction of a test - one form - for the final administration.

The reconstructed test is being reviewed by a jury of experts; the results of the evaluation will be used to make further revisions before completion of the final test and examiner's manual. A copy of each of the original test forms - A and B -, the examiner's manuals, the present test form/manual is enclosed. Following the administration of the final test, the statistical analyses will again include a Flanagan item analysis to check content validity and a Kuder-Richardson Formula 20 to determine the reliability coefficient. Also, a test of significance of difference between the means will be used in testing hypotheses 1 and 2 as stated earlier.

Three states have been chosen from the list of "Ready? Set... Go!" users--provided by NIT--to be used in the final study: California, Maryland, and Oklahoma. They were selected because of their geographical location, namely, western, eastern, and central United States.

Originally, a 1% sample from the three-state population was considered. Since the population is indefinite, the sample is estimated at 750-1,000.

The teachers/children will be selected randomly from those meeting the criteria. Copies of the test and examiner's manual will be mailed directly to the teachers chosen to participate.

NOTE:

It might be well to mention that the study has the support of Mr. Saul Rockman, Director of Research for National Instructional Television Center of the Agency for Instructional Television. Financial assistance for the project has been granted and already received. Also, Dr. Kate R. Barrett, co-author of the series, is on the doctoral committee and is serving on the jury of experts. Miss Jane Young, the television teacher, is also a member of the jury.

It is hoped that the teachers/children in the Oklahoma City area who are involved in "Ready? Set... Go!"/Level One during the 1974-75 school year and who meet the criteria will be granted the opportunity to participate in the final study. Your cooperation and assistance in this project will be deeply appreciated.

INVOLVEMENT OF OKLAHOMA CITY SCHOOLS: (use back of sheet, if necessary)

Assistance is needed in the following ways:

1. Granting permission for the test to be administered in your state
2. Identifying the first and second grade teachers who are involved in "Ready? Set... Go!"/Level One during the present 1974-75 school year
3. Distributing a questionnaire to the teachers who are identified.
(A copy of the questionnaire is enclosed.)
4. Securing permission for the teachers who are selected to administer the test to their children

The information gained from the questionnaire will aid in locating the teachers/children whose situation meets the necessary criteria for administration of the test. These teachers will be asked to administer the test to their children in May, 1975, immediately following the final lesson. Administration time is estimated at approximately 30-35 minutes.

Submit 4 copies to: Research Coordinator, Oklahoma City Public Schools,
900 N. Klein, Oklahoma City, Oklahoma 73106

All applications will be reviewed by a Research Committee. You will be notified by mail as to the decision of the committee, and this process will usually take about two weeks.

Oklahoma City Public Schools

900 North Klein

Oklahoma City, Oklahoma 73106

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February 10, 1975

Virginia Hart
Box 431
Mars Hill, North Carolina 28754

Dear Virginia:

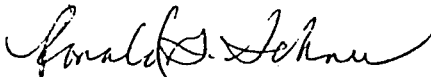
I am happy to inform you that the Research Committee has approved your proposal to involve Oklahoma City in the "Ready? Set... Go!" study. Loyce Willett and I need a little more information before we proceed further:

1. We didn't receive a copy of the teacher's questionnaire for use in locating the sample group.
2. From the teachers/students identified in grades 1-2, who watches the program, what criteria will you use for selecting the sample?
3. Since we don't usually participate in test normings, what information or feedback will we receive as a result of our involvement?

Loyce and I represent only the Oklahoma City Public Schools and not the State of Oklahoma. To obtain information about where the program is being watched in other areas of the state, I would suggest that you contact the following person:

Harvey Tedford
State Department of Education
State Capitol
Oklahoma City, Oklahoma 73105

Sincerely,



Ronald G. Schnee, Ed.D.
Research Coordinator

RGS:rp

TO: Principals of Elementary Schools in the Oklahoma City System

FROM: Virginia Hart
Department of Physical Education
Mars Hill College
P. O. Box 431
Mars Hill, North Carolina 28754

RE: Information needed for a doctoral dissertation

DATE: April 1, 1975

Dr. Ron Schnee, Research Coordinator, Oklahoma City Public Schools, has informed me that permission has been granted for a paper-and-pencil test based on "Ready? Set... Go!" to be administered in the elementary schools in the Oklahoma City area. Dr. Loyce Willett has offered her assistance, also.

Your name appears in the 1974-75 Personnel Directory as the principal of one of the Primary Level Schools. Your assistance is needed in distributing the enclosed questionnaire to the first and second grade teachers in your school who are using "Ready? Set... Go!" - a television course for elementary physical education/Level One during the 1974-75 school year. The information gained from the questionnaire will help locate the teachers whose situation meets the necessary criteria for administration of the test.

Copies of the questionnaire are enclosed. The decision on the number to send was based on the information in the Personnel Directory. If the number is not sufficient, it is possible that two in your school might share a form or duplicate it. Also enclosed is a self-addressed label to make it easier for you to use the same envelope for returning the completed forms. You might prefer having the teachers return them directly to me. Either way will be satisfactory. Please return or have them returned at the earliest convenience. I will need to get the tests and manuals to the teachers shortly after May 2, the date of the last television lesson.

Might I assume that providing your assistance will also indicate your willingness to grant permission for the teachers to administer the test to their children? There is a place on the form for you to sign before returning them, if permission is granted. Administration time is estimated at approximately 30-40 minutes. Teachers will be chosen randomly from those meeting the criteria. Return postage is not included since I do not know your plans for having the forms returned. If reimbursement is necessary, please advise.

Thank you in advance for your cooperation and assistance.

TO: Teachers of grades one and two in the Oklahoma City area who are presently users of the "Ready? Set... Go!" television course for elementary school physical education/Level One

FROM: Virginia Hart, Department of Physical Education, Mars Hill College, Box 431, Mars Hill, North Carolina 28754

RE: Information needed for a doctoral dissertation

DATE: April 1, 1975

I am trying to identify first and second grade teachers/children who are participating in "Ready? Set... Go!"/Level One during the 1974-75 school year.

Will you please supply the following information?:

Your Name: _____

Home Address: _____ Zip _____

School: Name/Address: _____
 _____ Zip _____

Telephone Number: Home _____ School _____

Principal's Name: _____

Address (if different from above) _____
 _____ Zip _____

Are you and/or your children participating in "Ready? Set... Go!" during the 1974-75 school year? Yes ___ No ___

If the above answer is "No", please refer to the starred (*) item in the form and supply the requested information.

If the above answer is "Yes":

Do you have access to television? Yes ___ No ___

Do the children participate at the time the lessons are being broadcast? Yes ___ No ___

If the answer to either of the two previous questions is "No", please describe the situation: _____

Do you use the series on a weekly basis as it is presented in the manual and in the presence in television? Yes ___ No ___

Do you provide weekly follow-up lessons? Yes ___ No ___

If "Yes", indicate the number per week. _____

What grade/grades is/are involved? K ___ 1st ___ 2nd ___ 3rd ___

How many children are involved? _____

Which level are you using? I ___ II ___

What type room or area is used? Gymnasium ___ Multipurpose ___

Classroom ___ Other _____

Are the children getting any other physical education in addition to "Ready? Set... Go!?" Yes ___ No ___

If "yes", indicate the number of days per week. _____

If your situation meets my criteria, would you be willing to cooperate by administering a group pictorial paper-and-pencil test based on "Ready? Set... Go!" to your children upon completion of the program in May, 1975? Yes ___ No ___

Indicate the date of the final lesson _____

*Please supply the names of other first and second grade teachers in your school who are using "Ready? Set... Go!"/Level One:

Thank you for your assistance.

If you indicated your willingness to participate in this study, please ask your principal to sign this form granting his/her permission for the test to be administered in the school.

Principal's Signature

NOTE: No school or teacher will be identified by name in the study; if the need should arise, numbers will be used instead.

TO: Teachers of "Ready? Set... Go!", 1974-75 who responded to the questionnaire and whose situation is satisfactory

FROM: Virginia Hart, Box 431, Mars Hill, North Carolina 28754

RE: Administration of a paper-and-pencil test based on the "Ready? Set... Go!" Series/Level One

DATE: May 12, 1975

Thank you for your response to my recent communication and for completing the questionnaire concerning your involvement in the "Ready? Set... Go!" Series/Level One.

Your situation is satisfactory for administering the test, namely: 1) the children are in first or second grade; they are participating in the program. Your name has been chosen from those meeting the criteria and who indicated a willingness to be of assistance by administering the test.

I am enclosing test booklets for the number of children indicated on the form returned by you, a test booklet for you, and two examiner's manuals.

Please administer the test to your children as soon as it is convenient following the completion of the series. Return all materials to me at the above address as soon as possible. Stamps are enclosed in the amount of the postage it took to mail the materials to you. Return as educational materials.

I would appreciate any comments concerning or reactions to the test items themselves and/or the examiner's manual. You may make your comments, if you have any, in the examiner's manual, in the test booklet, or on a separate sheet of paper.

Thank you for completing and returning the earlier questionnaire and for your willingness to administer the test. Your comments will also be deeply appreciated. Results of the test will be reported to you as soon as the statistical analysis is completed.

APPENDIX E
MATERIALS RELATED TO
CLASSIFICATION
OF COGNITIVE
OBJECTIVES

TABLE A

Classification of Cognitive Objectives Into Levels
and Identification of Test Forms and Items

Cognitive Level	Objectives	<u>Test Forms and Item Numbers</u>			Final Form
		A	B	1st Revision	
	The child should be able to:				
1.11	1. Be familiar with the following movement terms and phrases: body parts, traveling using own space and traveling using all space.	7 25	14	2 23 -- 38	2 21 -- 33
1.11	2. Be familiar with the following movement terms and phrases: high, middle, low levels, change in levels, moving over, moving around.	1 6 9	23 24 25	6 21 11 15 12 25	6 19 10 13 11 23
1.11	3. Be familiar with the movement phrase: make the ball travel to partner.	5		8	
1.20	4. Realize that speed and range are factors governing force.	21		16	14
1.11	5. Be familiar with the following movement terms and phrases: direction, different directions, range maximum range, force control of force.	11 20	8	4 -- 30	4 -- 28

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CONTINUED

TABLE A CONTINUED

Cognitive Level	Objectives	Test Forms and Item Numbers			Final Form
		A	B	1st Revision	
2.10	6. Comprehend that the follow-through of the body part should be executed in the direction of the intended path of the object being propelled.		4	13	
2.10	7. Understand that to hold one's balance weight must be evenly distributed over the base of support (positions of center of gravity over base of support; the lower the body is to the floor the more stable its position the higher the body is to the floor the less stable its position).	10		24	22
		23		33	--
		16		--	--
			13	--	--
1.11	8. Be familiar with the following movement terms and phrases: balance, balancing on different body parts, base of support, gravity, center of gravity, stretch and curl (tuck).	7		2	2
		16		--	--
		5		--	--
			7	--	--
			11	36	--
		12	1	1	
3.00	9. Apply the concepts of balance relating to distribution of weight over base of support and position of body in space (high, low) and its stability.	2		--	--
		23		33	--
		10		24	22
1.11	10. Be familiar with the following movement terms and phrases: ability to give, distribution of weight.	7		2	2
		4			
			18	20	18
		14		37	32
		10	17	15	

CONTINUED

TABLE A CONTINUED

Cognitive Level	Objectives	Test Forms and Item Numbers			Final Form
		A	B	1st Revision	
2.10	11. Understand that force is imparted and received in the direction in which it is moving or is to move.		18	20	18
2.10	12. Understand that absorption of force should begin immediately after contact is made with the floor.	4	18	20	18
1.11	13. Be familiar with the following movement terms and phrases: force, giving, follow-through and landing.	14	10 18	37 17 20	32 15 18
1.11	14. Be familiar with the following phrase: lifting different body parts high.		14	--	--
1.21	15. Know that tagging is executed by touching a person lightly and the result of this act is interpreted as catching or being caught.	24		10	9
1.21	16. Know the criteria necessary for an efficient run.	15	3	27 --	25 --
1.11	17. Be familiar with the following movement terms and phrases: tagging, balls of the feet.	24	20	10 32	9 30
1.11	18. Be familiar with the following movement terms or phrases: movement in relationship with a partner (move towards, away, around, alongside, in front and in back).	22		3	3

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CONTINUED

TABLE A CONTINUED

Cognitive Level	Objectives	Test Forms and Item Numbers			Final Form
		A	B	1st Revision	
1.11	19. Be familiar with the movement terms: twisting and turning.	18	6	14 --	12 --
1.11	20. Be familiar with the following movement terms and phrases: opposite movements (large-small, stretch-curl, wide-narrow, high-low), twist, locomotor and non-locomotor movement.	3 8 17	1 12 21	19 29 18 -- 1 --	17 27 16 -- 1 --
1.11	21. Be familiar with the following movement terms and phrases: force, relation between force and speed of throwing arm, range of movement, and throwing pattern.		17	22	20
1.11	22. Be familiar with the following movement terms and phrases: swinging, focus on a spot, rebound.	12	9 5	26 28 7	24 26 7
1.11	23. Be familiar with the following movement phrase: body leads.	19		--	--
4.10	24. Analyze the similarities between striking and throwing patterns.	4	15 16	-- 34 9	-- 31 8
1.11	25. Be familiar with the following movement terms and phrases: strike, matching your movements, and striking patterns.		15 22	34 5	31 5

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CONTINUED

TABLE A CONTINUED

Cognitive Level	Objectives	Test Forms and Item Numbers			Final Form
		A	B	1st Revision	
1.11	26. Be familiar with the following movement terms or phrases: hit, follow-through with the striking part, and back and forth.	*	*	*	*
1.21	27. Know that the force of a kick is derived from the size of the swinging arc (distance traveled) and the speed of the swinging lever (leg).	21		16	14
1.11	28. Be familiar with the following movement terms or phrases: instep, outside of foot, stopping the ball with their body, and pathway of a ball.	13	2	31 --	29 --

Note. -- indicates item was not used in the final form of the test

* no test item was designed for the objective

APPENDIX F
MATERIALS RELATED TO
THE
TEST BOOKLET
AND
TEST MANUAL

Ready? Set... Go!

Primary

Knowledge

Level One

Achievement

(For grades 1 & 2)

Test

by Virginia Hart

Name _____ Boy Girl

Grade _____ Teacher _____

School _____ Date of Testing _____
y m d

City or County _____ Date of Birth _____
y m d

State _____ Age _____

_____ To The Teacher

Before permitting the children to open their test booklet, be sure that each child's name, age, school, and other information are filled in on the front cover. Encourage the children to do as many items as they can.

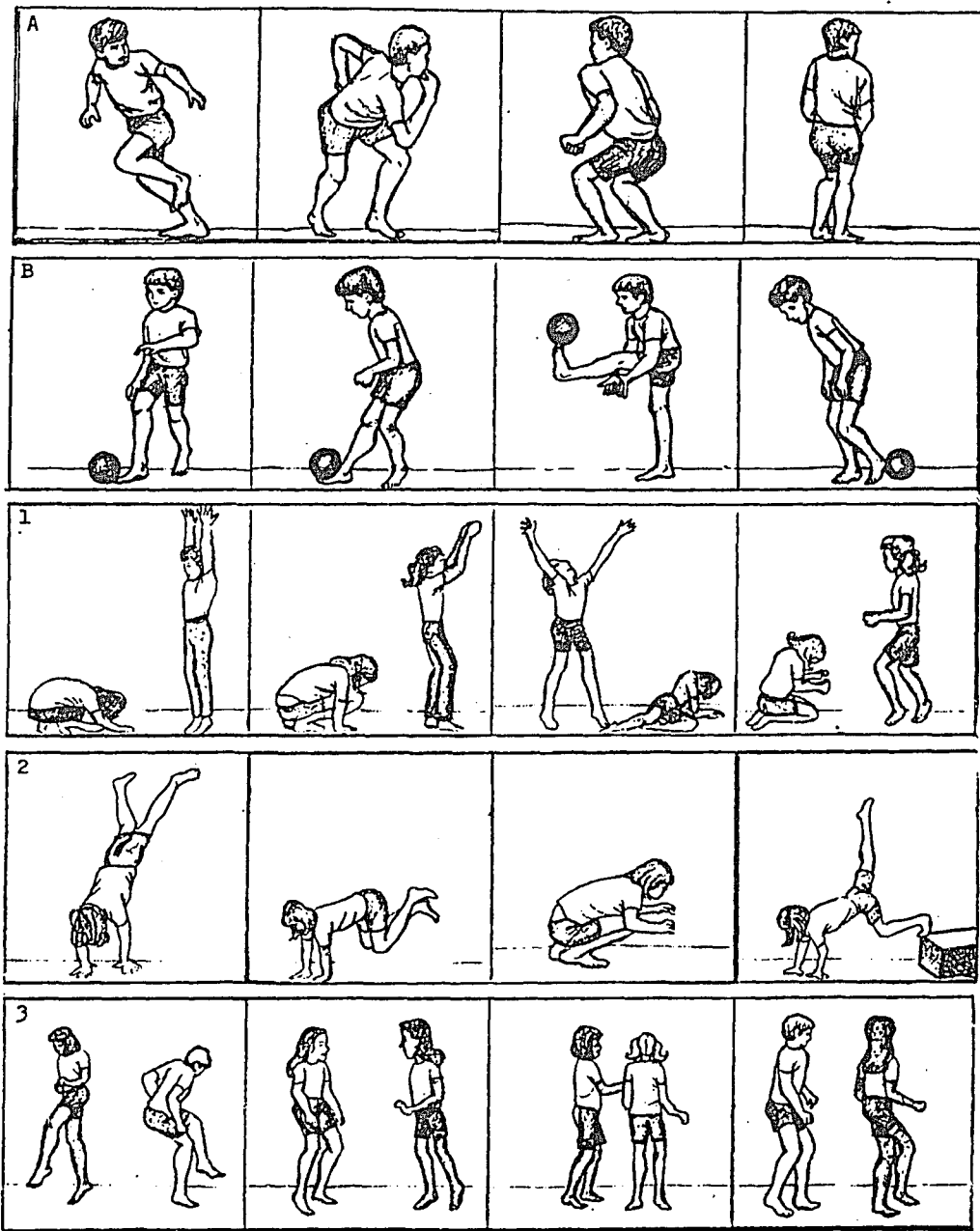
Maximum
Possible
Score

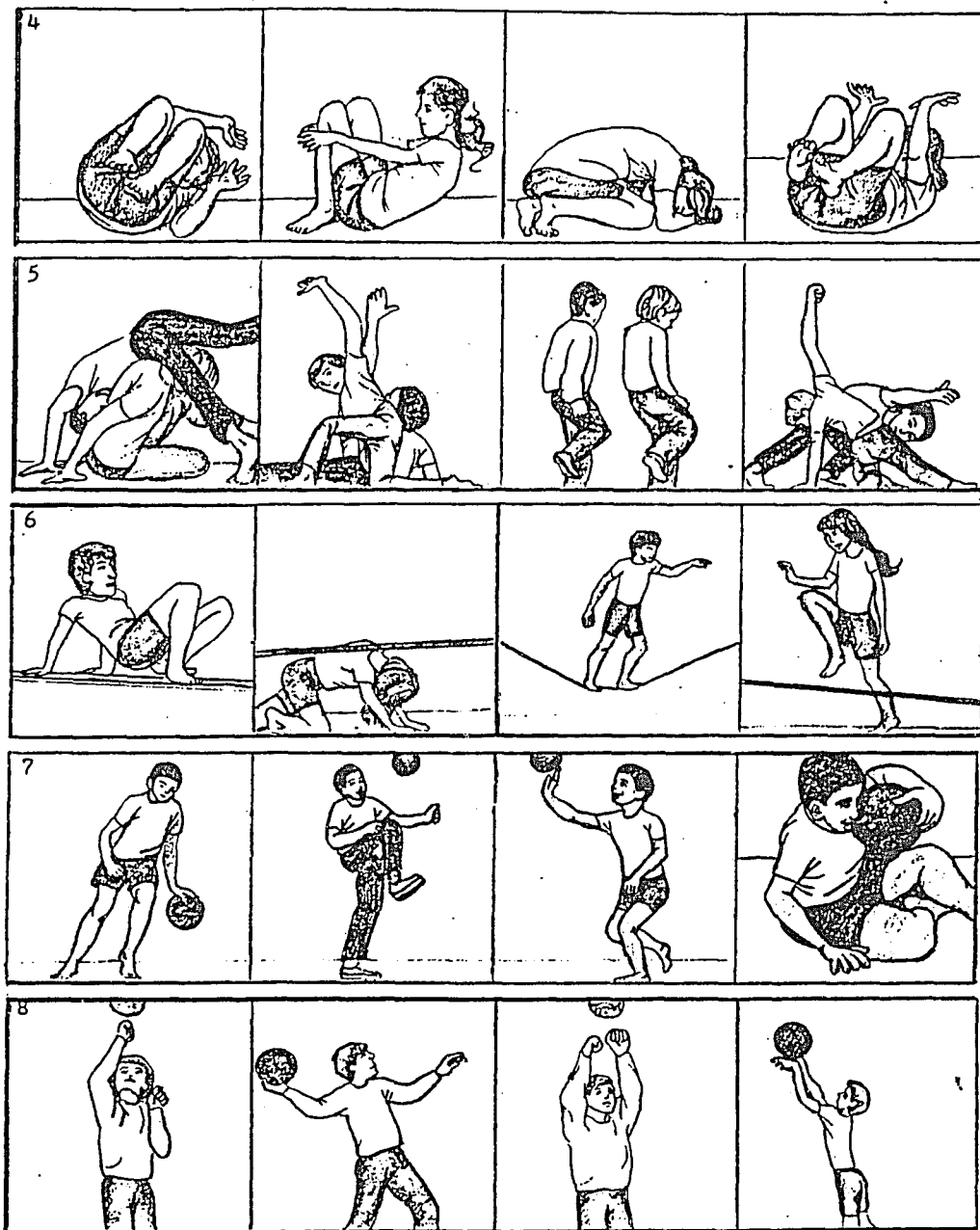
33

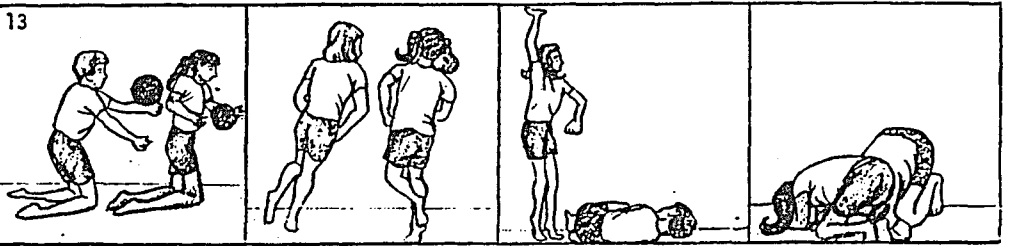
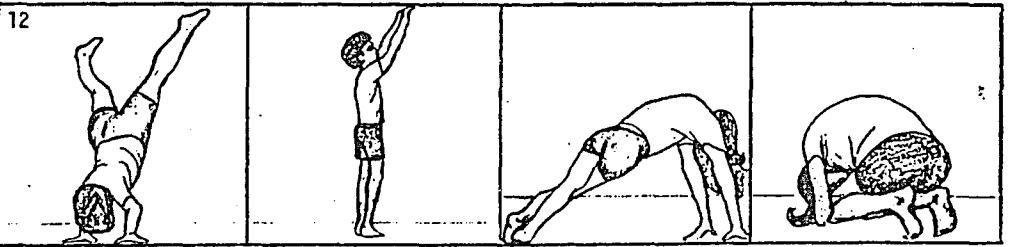
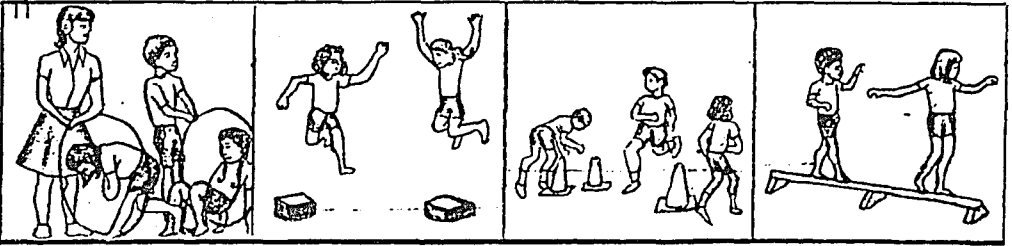
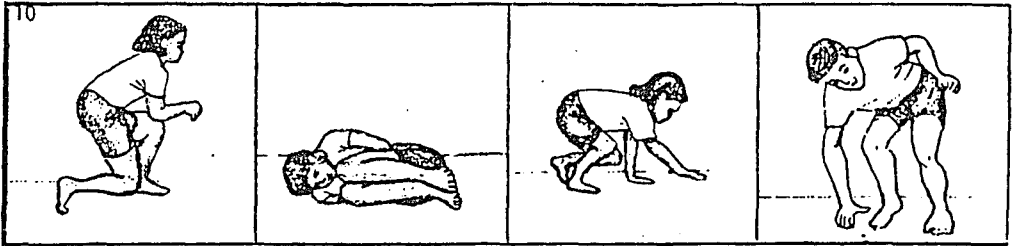
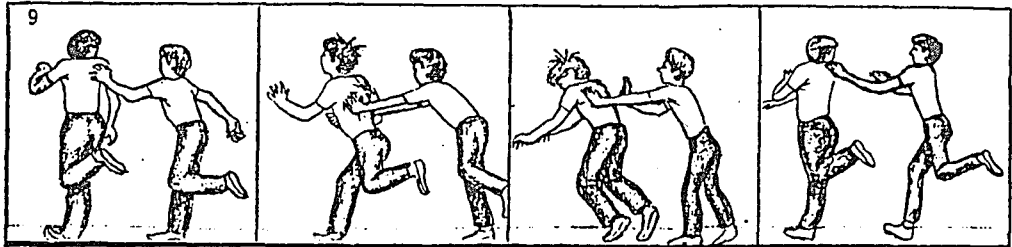
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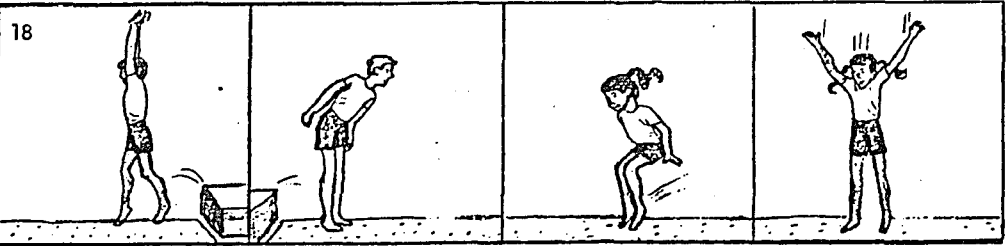
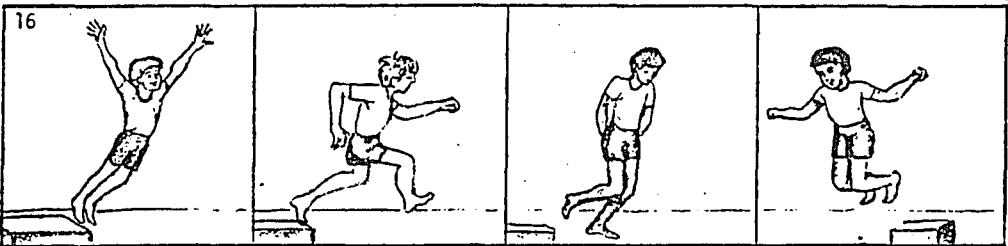
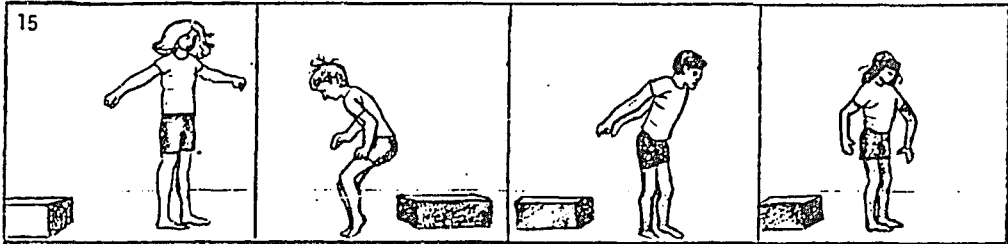
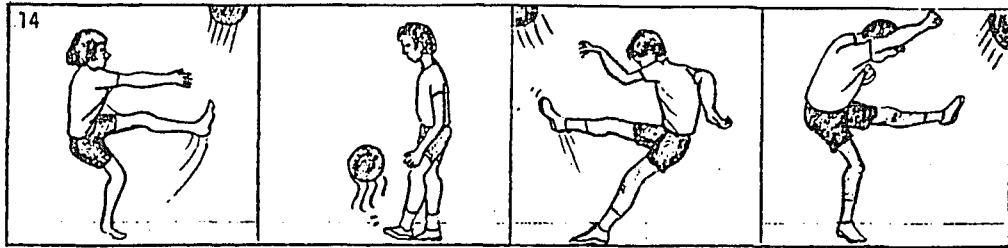
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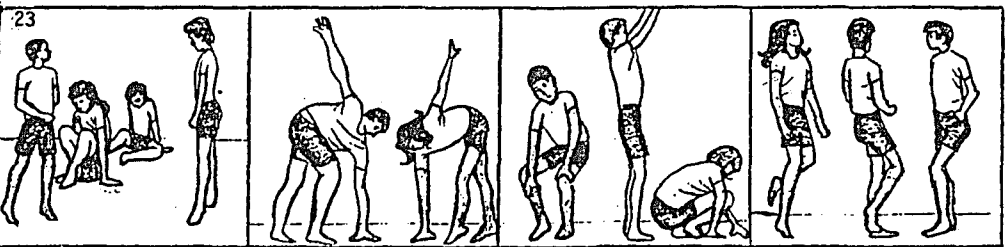
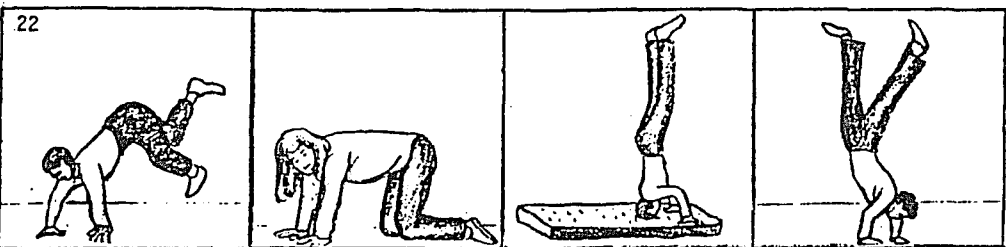
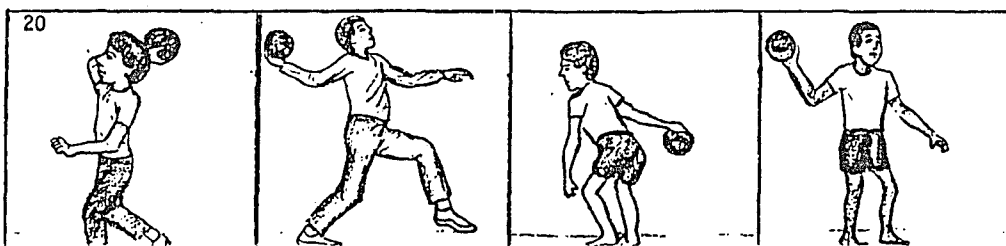
KEEP TEST BOOKLET CLOSED UNTIL YOU ARE TOLD TO OPEN IT.

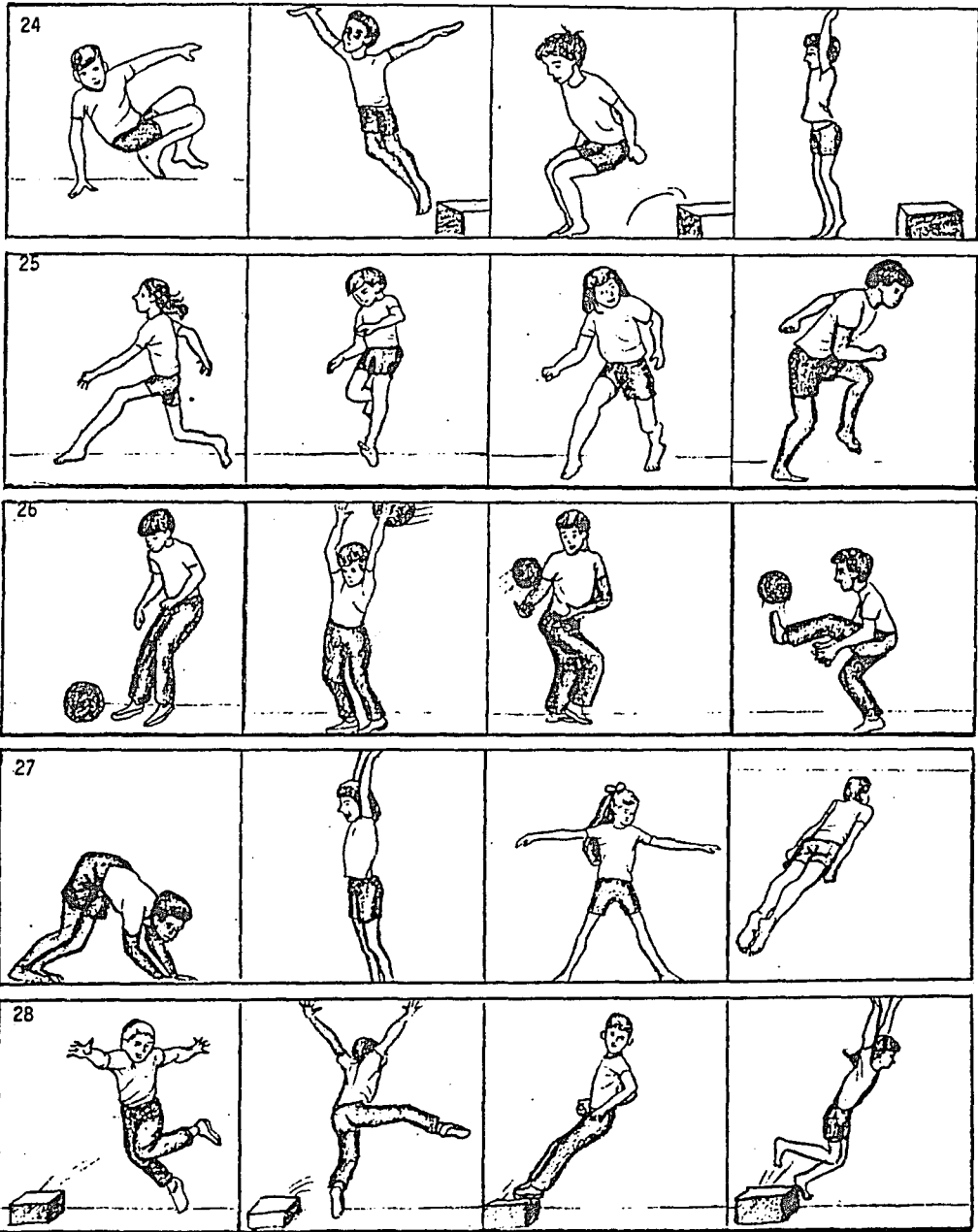


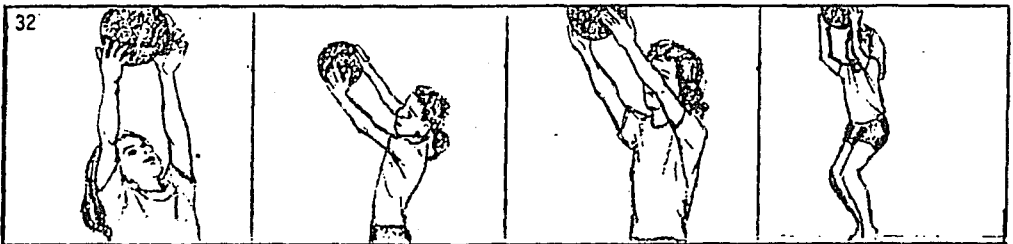
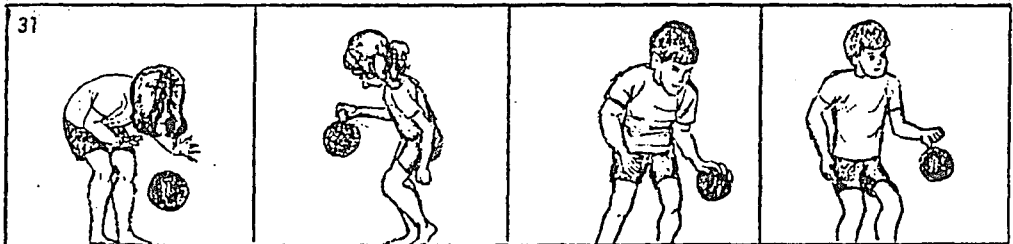
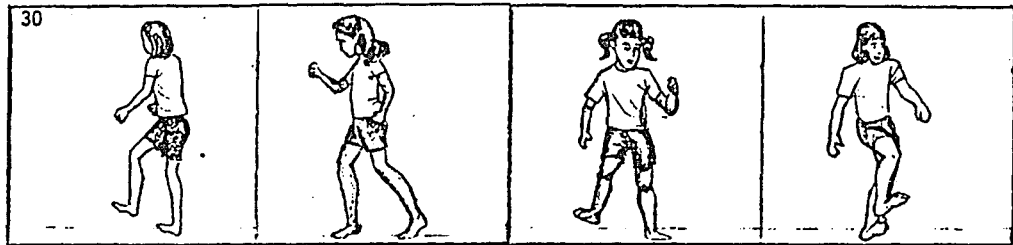
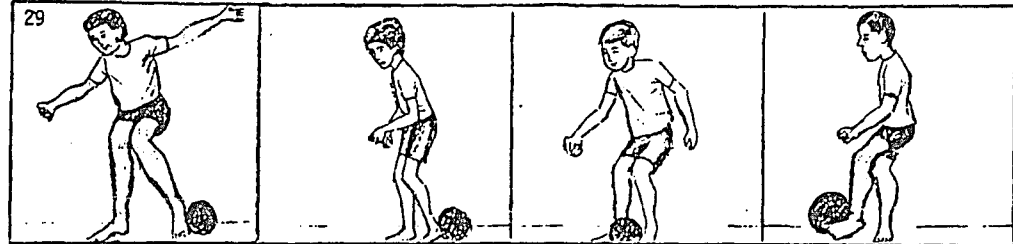












Ready? Set... Go!

Knowledge

Achievement

Test

by Virginia Hart

EXAMINER'S MANUAL

Primary Level One/For Grades 1 and 2

READY? SET... GO! KNOWLEDGE ACHIEVEMENT TEST

For Group Use

EXAMINER'S MANUAL

PURPOSE/DESCRIPTION OF THE TEST

The "Ready? Set... Go!" Knowledge Achievement Test is designed to assess knowledges and understandings based on "Ready? Set... Go!" a television course for elementary school physical education/Level One. The purpose is to determine whether or not the program as presented in the television series is meeting the cognitive objectives for which it was originally intended.

The instrument is a group paper-and-pencil test for first and second grades. It consists of 2 sample questions followed by 33 test questions arranged in approximate order of difficulty. Each item consists of a set of 4 pictures; the statements are read aloud to the children by the examiner.

The test requires approximately 35 minutes to administer. This time estimate should provide ample opportunity for all to mark the item after each statement is read.

GENERAL DIRECTIONS FOR ADMINISTRATION

Before proceeding with the administration of the test, the examiner should become thoroughly familiar with the test and all information in the manual, especially the following instructions and suggestions.

Preparing Materials

All materials should be in order:

1. The child's full name and other requested information should be printed on the first page of the test booklet.
2. Each child should have 2 sharpened pencils with an eraser and a marker to help the child keep the place. (A sheet of paper can be used.)
3. The examiner should have the manual, a copy of the test, a marker for demonstration, extra pencils, a felt point pen or magic marker, a transparency containing the 2 sample items, an overhead projector, and a stop watch.

Preparing the Classroom

1. Before testing, special seating should be planned. Arrange the desks or tables in such a way that all can see the examiner at the chalk board or the area onto which the sample items are projected if using the transparency. An effort should be made to minimize the opportunity to copy from one another.
2. A sign on the door should request that no one enter the room during testing. If the test is being administered in an open classroom environment, the area should be carefully arranged to avoid interruptions.

Administering the Test

1. Follow directions exactly. Read through the Specific Directions carefully.
2. Give directions twice only, except in case of the sample item. Directions for the sample item may be repeated to insure understanding.

3. Check or have aides check after each direction to see if children have the proper place and understand what to do. Give help when needed but give no hint of the correct answer to any item. It is good to have one or two monitors so that the examiner does not need to do too much moving around.

4. Pace the children through the test. Pause briefly after each direction to give all children time to mark and monitors time to check quickly. (Ten seconds should be sufficient time for marking an item.)

5. Encourage children to try to answer each item.

6. Children may make corrections by erasing.

SPECIFIC DIRECTIONS

Throughout the manual, instructions printed in BOLD FACE TYPE are to be read aloud to the children. Read all directions slowly and clearly, giving children sufficient time to follow directions at their own rate. (The test has a time limit but ample time is provided.)

See that all pupils have pencils, erasers, and markers on their work spaces.

Detailed Directions:

Introducing the Test

SAY: I AM GOING TO GIVE EACH OF YOU A BOOKLET IN WHICH WE WILL DO SOME WORK. SEE HOW WELL YOU CAN DO. LEAVE YOUR PENCIL DOWN ON YOUR DESK UNTIL I TELL YOU TO PICK IT UP. YOU WILL BE TOLD WHAT TO DO JUST TWICE: THEREFORE, YOU MUST LISTEN CAREFULLY. YOU WILL BE GIVEN ONE OF THESE BOOKLETS. (Hold up a booklet.) DO NOT OPEN IT UNTIL YOU ARE TOLD.

Distribute the test booklets, face up, to each pupil. Make sure that each pupil receives the booklet with his name and information on it.

SAY: POINT TO THE NAME ON YOUR BOOKLET TO BE SURE IT IS YOURS.

SAY: YOU MUST DO THE WORK BY YOURSELF. LOOK ONLY AT YOUR OWN BOOK.

OPEN THE FIRST PAGE AND TURN IT BACK LIKE THIS. (Demonstrate.)

Be sure each child has the right place. Keep a test booklet in your hand to illustrate each part of these directions.

Pupils are to mark their answers on the picture. They will use a big X for marking on the picture which is the correct answer. .

There is only one correct answer.

SAY: NOW, PLACE YOUR MARKER JUST BELOW THE FIRST ROW OF PICTURES.

(Demonstrate.)

The first two rows of pictures are sample items which provide practice in the technique of marking. They will not be scored.

SAMPLE ITEMS

Use the transparency to project the sample items on wall or screen, and a felt point pen or magic marker to mark the correct picture. Or, you may place the sample items on the chalk board.

SAY: LOOK AT THE PICTURES IN THE FIRST ROW AT THE TOP OF THE PAGE. YOU WILL MAKE A BIG ON THE PICTURE WHICH IS THE CORRECT ANSWER.

SAY:

A. BE SURE YOUR MARKER IS UNDER THE FIRST ROW OF PICTURES. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO NEEDS TO LOWER HIS CENTER OF GRAVITY TO HELP HIM CHANGE DIRECTION. PUT A MARK ON THE CORRECT PICTURE. MAKE YOUR MARK LIKE THIS: .

B. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO IS MOVING THE BALL WITH THE INSTEP OF HIS FOOT. PUT A MARK ON THE CORRECT PICTURE. MAKE YOUR MARK LIKE THIS: .

Put a big X on the correct picture in your booklet and hold it up for inspection. Also turn on overhead projector showing the sample items, one at a time (cover B while marking A.) Put a mark on the fourth picture in sample item A; then mark the second picture in sample item B. Or, have 2 sets of 4 boxes on the chalk board and mark a big X in the correct ones as indicated above; A - answer is number 4; B - answer is number 2. These will correspond to the correct pictures in their test booklets.

Have monitors help check to see that each child has found the proper picture in each sample item. Then start reading the test questions. (It is NOT necessary to read all question numbers; read the number of the item at the top of each page.)

SAY:

1. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILDREN WHO ARE SHOWING THE BEST STRETCH AND CURL. PUT A MARK ON THE CORRECT PICTURE.
2. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS TAKING HER WEIGHT ON THREE BODY PARTS. PUT A MARK ON THE CORRECT PICTURE.
3. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE PARTNERS WHO ARE FACING AWAY FROM EACH OTHER. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

Demonstrate. See that all booklets are folded back so that only page 2 is showing. Check to see that each child has turned to the right page. Read the next question number: 4.

SAY:

4. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES OF THIS PAGE. IT IS QUESTION NUMBER 4. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO IS ROLLING SIDEWARD. PUT A MARK ON THE CORRECT PICTURE.
5. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILDREN WHOSE SHAPES ARE THE SAME. PUT A MARK ON THE CORRECT PICTURE.
6. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS GOING OVER THE EQUIPMENT. PUT A MARK ON THE CORRECT PICTURE.
7. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS MAKING THE BALL BOUNCE FROM THE FLOOR. PUT A MARK ON THE CORRECT PICTURE.
8. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS GOING TO THROW THE BALL. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

Demonstrate. See that all booklets are folded back so that only page 3 is showing. Check to see that each child has turned to the right

page. Read the next question number: 9.

SAY:

9. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES ON THIS PAGE.

IT IS QUESTION NUMBER 9. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO IS TAGGING ANOTHER CHILD LIGHTLY AND SAFELY. PUT A MARK ON THE CORRECT PICTURE.

10. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILD WHO IS WORKING AT THE LOWEST LEVEL. PUT A MARK ON THE CORRECT PICTURE.

11. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILDREN WHO ARE MOVING ALONG THE EQUIPMENT. PUT A MARK ON THE CORRECT PICTURE.

12. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILD WHO IS TWISTING. PUT A MARK ON THE CORRECT PICTURE.

13. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILDREN WHO ARE SHOWING DIFFERENT SHAPES. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

See that all booklets are folded back so that only page 4 is showing. Check to see that each child has turned to the right page. Read the next question number: 14.

SAY:

14. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES ON THIS PAGE. IT

IS QUESTION NUMBER 14. LOOK AT THE PICTURES IN THIS ROW. FIND THE

PICTURE OF THE CHILD WHO NEEDS A BIGGER SWING OF THE LEG TO KICK THE BALL WITH MORE FORCE. PUT A MARK ON THE CORRECT PICTURE.

15. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILD WHO IS GIVING WHEN LANDING AFTER COMING OFF THE BOX. PUT A MARK ON THE CORRECT PICTURE.

16. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILD WHO IS SHOWING THE MOST STRETCH WHEN COMING OFF THE BOX. PUT A MARK ON THE CORRECT PICTURE.

17. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILDREN WHO ARE SHOWING OPPOSITE SHAPES. PUT A MARK ON THE CORRECT PICTURE.

18. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.

FIND THE PICTURE OF THE CHILD WHO IS MAKING A SOFT LANDING. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

See that all booklets are folded back so that only page 5 is showing.

Check to see that each child has turned to the right page. Read the next question number: 19.

SAY:

19. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES ON THIS PAGE. IT

IS QUESTION NUMBER 19. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILDREN WHO ARE HANDLING THE BALLS AT DIFFERENT LEVELS. PUT A MARK ON THE CORRECT PICTURE.

20. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHOSE RANGE OF MOVEMENT WILL HELP HIM THROW THE BALL WITH MORE FORCE. PUT A MARK ON THE CORRECT PICTURE.
21. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILDREN WHO ARE HANDLING THE BALLS WITH DIFFERENT BODY PARTS. PUT A MARK ON THE CORRECT PICTURE.
22. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS IN AN OFF-BALANCE POSITION. PUT A MARK ON THE CORRECT PICTURE.
23. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILDREN WHO ARE MOVING AT MEDIUM AND LOW LEVELS ONLY. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

See that all booklets are folded back so that only page 6 is showing. Check to see that each child has turned to the right page. Read the next question number: 24.

SAY:

24. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES ON THIS PAGE. IT IS QUESTION NUMBER 24. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO IS LOOKING AT THE SPOT WHERE HE IS LANDING. PUT A MARK ON THE CORRECT PICTURE.
25. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES. FIND THE PICTURE OF THE CHILD WHO IS SHOWING OPPOSITION IN ARMS AND LEGS WHILE RUNNING. PUT A MARK ON THE CORRECT PICTURE.

26. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO NEEDS TO KEEP HIS EYES ON THE BALL WHILE HE IS TRYING TO CONTROL IT. PUT A MARK ON THE CORRECT PICTURE.

27. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO IS SHOWING A WIDE SHAPE. PUT A MARK ON THE CORRECT PICTURE.

28. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO IS COMING OFF THE BOX IN A FORWARD DIRECTION. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. TURN TO THE NEXT PAGE AND FOLD YOUR BOOKLET BACK.

See that all booklets are folded back so that only page 7 is showing. Check to see that each child has turned to the right page. Read the next question number: 29.

SAY:

29. PLACE YOUR MARKER UNDER THE FIRST ROW OF PICTURES ON THIS PAGE. IT IS QUESTION NUMBER 29. LOOK AT THE PICTURES IN THIS ROW. FIND THE PICTURE OF THE CHILD WHO IS USING THE OUTSIDE OF HIS FOOT TO MOVE THE BALL. PUT A MARK ON THE CORRECT PICTURE.

30. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO IS RUNNING ON THE BALLS OF THE FEET. PUT A MARK ON THE CORRECT ANSWER.

31. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO IS SHOWING THE BEST HAND POSITION TO CONTROL THE BALL WHILE STRIKING. PUT A MARK ON THE CORRECT PICTURE.

32. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILD WHO IS GIVING WITH THE BALL AS IT
IS CAUGHT. PUT A MARK ON THE CORRECT PICTURE.

33. MOVE YOUR MARKER DOWN AND PUT IT UNDER THE NEXT ROW OF PICTURES.
FIND THE PICTURE OF THE CHILDREN WHO ARE SHOWING GOOD USE OF
SPACE. PUT A MARK ON THE CORRECT PICTURE.

SAY: NOW, PUT YOUR PENCIL DOWN. CLOSE YOUR BOOKLET AND PUT IT ON
YOUR TABLE OR DESK WITH THE FRONT UP.

Collect booklets.



KEY: FINAL TEST: READY? SET... GO! KNOWLEDGE ACHIEVEMENT TEST

- | | |
|-----|---|
| 1. | 1 |
| 2. | 4 |
| 3. | 1 |
| 4. | 1 |
| 5. | 3 |
| 6. | 4 |
| 7. | 1 |
| 8. | 2 |
| 9. | 1 |
| 10. | 2 |
| 11. | 4 |
| 12. | 3 |
| 13. | 3 |
| 14. | 2 |
| 15. | 2 |
| 16. | 1 |
| 17. | 4 |
| 18. | 3 |
| 19. | 1 |
| 20. | 2 |
| 21. | 3 |
| 22. | 1 |
| 23. | 1 |
| 24. | 3 |
| 25. | 4 |
| 26. | 2 |
| 27. | 3 |
| 28. | 4 |
| 29. | 1 |
| 30. | 2 |
| 31. | 3 |
| 32. | 4 |
| 33. | 2 |