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**MALIZOLA, Florence Theresa, 1939-
THE TEACHING OF BADMINTON SKILLS TO THE
ADOLESCENT: TRADITIONAL VS. PROGRAMMED.**

The University of North Carolina at Greensboro,
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THE TEACHING OF BADMINTON SKILLS
TO THE ADOLESCENT:
TRADITIONAL
VS.
PROGRAMMED

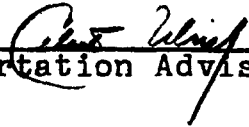
by

Florence Theresa Malizola

A Dissertation Submitted to
the Faculty of the Graduate School at
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Doctor of Education

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MALIZOLA, FLORENCE THERESA. The Teaching of Badminton Skills to the Adolescent: Traditional vs. Programmed. (1974)
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The purpose of this study was to develop and validate a programmed-instructional tool to teach badminton skills to adolescents of heterogeneous skills backgrounds. A second purpose was to compare the effectiveness of the traditional method of teaching with the programmed method as measured by the Miller Wall Volley post-test and by the subject's final ranking on the Circuit Badminton Tournament. Because of this it became necessary to develop a Circuit Badminton Tournament that was valid and reliable in testing general playing ability.

The subjects were one hundred fifty-four sophomore, junior, and senior girls who attended the New Trier West High School in Northfield, Illinois. Each of four intact classes was pre-tested with the Miller Wall Volley Test and then systematically divided into two groups. The author and another instructor each taught two programmed classes and two traditional classes. Half of each class was taught by Teacher 1 using the traditional method while the other half of the class was taught by Teacher 2 using the experimental method.

Eleven days were spent instructing the students in both the learning of the skills and the rules of the game. For the next ten days the students played in the Circuit Badminton Tournament and then took the Miller Wall Volley post-test.

The post-test and tournament scores were analyzed by a MANOVA, a multivariate analysis of variance which gives simultaneous consideration of two or more dependent variables to compare the effectiveness of the two instructional methods. Two MANOVA F ratios were computed for the effect of method, teacher, and teacher-method interaction with consideration of the two dependent variables.

Findings

1. The calculated MANOVA F ratio for the method effect was not significant at the .05 level of confidence.
2. The calculated MANOVA F ratio for the teacher effect was not significant at the .05 level of confidence.
3. The calculated MANOVA F ratio for teacher-method with the two dependent variables of post-test and tournament was not significant at the .05 level of confidence.

Conclusions

1. The programmed method of teaching was as effective as the traditional method of teaching.
2. The Miller Wall Volley Test proved to be an effective tool in equating the two halves of each class and was non-time consuming and easy to administer.
3. The Circuit Badminton Tournament was an effective tool in measuring playing ability for the time and space limitations of this study.

ACKNOWLEDGMENTS

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CHAPTER I

INTRODUCTION

Education in the United States Public schools has reached a crisis. One of the gathering forces which has precipitated the crisis is the adolescent who is impatient with authority and questions the worth of everything that is to be learned or done. An absence of individualization in the classroom leaves adolescents unsatisfied and believing that they can learn better on their own by experiencing everything that is meaningful to them now. Feibleman said that "The peak of performance is in maturity, but the peak of learning is in adolescence." (51:500)

This absence of individualization has brought an onslaught of new programs. Open schools, centers for self-directed learning, schools without walls, performance contracts and even teaching machines which threaten to replace teachers are all answers to the demand for individualization.

Schools with a minimum of funds are trying to make ends meet by putting larger numbers of students together with fewer teachers or cutting the "fringe" programs out of the curriculum. For these schools, teaching is aimed at the average student and teaching-learning individualization for the highly skilled or below average student is seldom

available. The adolescent is disenchanted with the rigid lock-step ways of American public education. There is an urgent need for schools to keep the top students challenged and still give attention to the slower students. Too many adolescents drop out of school and then ask, "Why?"

Obviously it is not possible to establish the ideal one-to-one relationship between teacher and student, even in the well-to-do schools. The members of a typical class usually have varying degrees of ability and past experience. Consequently, educators are confronted with the challenge to teach in such a manner that each student will benefit from quality instruction. Ofiesh said

We must do for education what Henry Ford did for the automobile assembly line and what Bessemer did for the steel process. We must "Bessemerize" quality education. If we could, we should take our master teachers and after a careful analysis of their techniques we should package their skills for millions of students. (67:4)

Unfortunately, the educational process of teacher production contributes many misfits. The student consumer suffers. Often the cognitive material to be learned is never learned because the atmosphere of the learning situation is not focused on learning but on teacher objectives. Emphasis is on what the teacher feels is most important. Frequently, nothing at all is achieved because no objectives were ever established.

Ofiesh (67) wrote that it is common knowledge that few students learn many specific things from teachers. In

today's educational scene a good teacher is one who inspires and motivates students to keep reading, studying, analyzing and discussing in the classroom. It is when a student can say to the teacher that he/she does not understand the process that a teacher finally teaches. This is often done in an extra period or in a private tutoring session. It is at this time that the teacher breaks down the concept into small steps of understanding and builds a logical sequence.

The idealist hopes that every student will master the objectives of the subject matter. Jenkins (95) postulated that there are three levels of acquiring objectives. Students are motivated to be familiar with information in that they recognize it, become so familiar with it that they can use it, or master it so that they can use it comfortably in any situation. It is these three levels that the instructor must deal with simultaneously in the classroom. Each level has a varying degree of perseverance needed to attain it.

Bloom (34) has suggested that much research is needed to determine how individual differences in learners can be related to variations in the quality of instruction. Findings have shown that some students learn quite well through independent learning while others need a highly structured teaching-learning situation.

It seems reasonable to expect that some students will need more concrete illustrations and explanations than others; some students may need more examples to get an idea than do others; some students may need more approval and reinforcement than

others; and some students may even need to have several repetitions of the explanation while others may be able to get it the first time. (34:4)

Bloom (34) believed that if every student had a very good tutor, most would be able to learn a particular subject quite well. In some of his experimental research Bloom found that small groups of two or three students which met regularly to go over points of difficulty in the learning process were most effective. The effectiveness was greatest when the venture was cooperative in nature and there was an absence of competition.

Bloom (34) has used workbooks and programmed instruction with students who cannot grasp ideas or procedures in the textbook form. Drill and specific tasks are useful for some while the small steps and frequent reinforcement in programmed units were helpful for others. Furthermore, Bloom suggested that each type of material may serve as a means of helping individual students at selected points in the learning process. A particular student may use whatever variety of materials are found to be useful as difficulties in the learning are encountered.

Perseverance is important in the learning process. Carroll (41) defined perseverance as the time the learner is willing to spend in learning.

If a student needs to spend a certain amount of time to master a particular task, and he spends less than this amount in active learning, he is not likely to learn the task to the level of mastery. (41:6)

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The time spent on learning is the key to mastery according to Carroll. According to this basic assumption, aptitude determines the rate of learning and most, if not all, students can achieve mastery if they devote the amount of time needed to the learning. To the educator, this implies that the student must be allowed to have enough time for learning to take place. In addition the student must devote the amount of time necessary to learn a task.

From Carroll's findings, Bloom (34) concluded that as a student finds the effort rewarding, more time on a particular learning task is likely to be spent. On the other hand, if the experience is frustrating, the student must reduce the amount of time devoted to learning. Even though the frustration level of students may vary, Bloom believed that all students will sooner or later give up a task if it is too painful for them.

Just as the student needs to be motivated, so the teacher needs motivation for the job. Ofiesh hoped that radical innovations would take place which would allow the teaching profession to emerge as a true profession. Six points emphasized his beliefs:

1. Teaching is not today a profession. It is, at best, a quasi-profession. It will not become a true profession until it develops an educational and instructional technology based on a science and theory of instruction rather than a set of theories and vague methods and practices which more often are a poor and, only in very rare moments, an excellent art.

2. The best hope for the emergence of instructional and educational technology lies in the fullest exploration of the concept and system of programmed learning and in the developing automation procedures of our contemporary society.
3. The automation of education does not mean the automation of men--it means the ultimate humanization of man.
4. A genuine humanist should welcome the automation of educational procedures and the development of the science of pedagogy.
5. What we need are people who are willing to lay the keel today for the launching of the instructional systems which will not come off the drawing boards until tomorrow.
6. We must innovate with an attitude of cautious urgency so that the unheard of today become tomorrow the way we did things yesterday. (67:2)

Ofiesh (67) felt that teaching had not and will not become a true profession until it developed the pedagogies and skills which can be tested and, more importantly, validated against the performance of students.

Programmed instruction is on the right track of a technological system that Ofiesh said is necessarily based on a science and theory of instruction. Its basic principles of precise definitions of objectives and validation of the objectives to insure accomplishment of these objectives should have a place throughout our educational system, wherever measurable objectives can be specified (48).

Because many tools and techniques have not changed for decades, education has frequently been called technologically backward and static in nature. We still do not know

how much and how well people learn. (60) Deterline (48) believed that inevitably we must come to a multitrack and multicurriculum approach that makes some concession to the reality that, not only does the student have to learn how to live and function in the real world--so does education.

Until recently, only a few educators have ever expressed their thoughts about the goals of education in terms of behavioral change. (75) Learning is a change in behavior. Programmed instruction is a behavioral technology; the emphasis is on behavior and the systematic modification of behavior. Programmed instruction brings a new element to education with emphasis on behavioral modification.

THE PROBLEM

Statement of the Problem

It was the purpose of this study to develop and validate a programmed-instructional tool to teach badminton skills to adolescents of heterogeneous skills backgrounds.

A second purpose was to compare the effectiveness of this traditional method of teaching with the programmed method. The effectiveness was measured by the Miller Wall Volley post-test and by the subject's final ranking in the Circuit Badminton Tournament.

DEFINITIONS OF TERMS USED

In this study terms have been defined as follows:

Programmed Instruction. The arrangement of materials to be learned in a series of small steps which are arranged to guide the student through self-instruction from the known to the unknown. This is very often done through the use of progressive TASKS which call for a specific situation and a goal.

Traditional Instruction. This teaching method consists of verbal instruction by the instructor, a demonstration and practice in the form of drills on the part of the students trying to attain the model of performance demonstrated by the teacher. When the teacher feels the majority of the class has attained the desired skill level, the class progresses to the next skill.

Linear Program. A type of program instruction which arranges the material and/or tasks into a single ordered sequence. The student proceeds in sequence from the first through the last of the materials or tasks.

Behavioral Objective. A statement that describes the desired behavior which is exhibited by the student to show that learning has occurred. The resulting behavior can be precisely observed or evaluated.

ASSUMPTIONS AND LIMITATIONS

1. All students made a sincere effort to attain the behavioral objectives of the Malizola Linear Program for badminton skills.
2. The tool developed was validated through effective student use and therefore was an effective instructional tool.
3. The selected badminton skill test (Miller Wall Volley) and The Circuit Badminton Tournament were valid and reliable indicators of a student's performance level in badminton.
4. Experienced instructors are equally effective in their teaching techniques using the programmed instructional tool.

HYPOTHESIS

Subjects taught by the traditional method and subjects taught by the programmed method will not differ in badminton playing ability as measured by:

1. The Miller Wall Volley Test (Post)
2. The final ranking in the Circuit Badminton Tournament.

IMPORTANCE AND RATIONALE OF THE STUDY

Badminton was selected as a research tool because of the author's enthusiasm for the game and the fact that weather conditions were of little consequence in badminton instruction. Most students have a certain degree of success with badminton. It is one of the few activities where a minimum of strategy can be combined with the basic skills of the game in order to achieve a planned attack.

The skills of badminton were selected to be programmed along with the "why and when you use them" because of the author's concern about the inefficient use of time and lack of individualized instruction prevalent in most skills classes. In addition there seemed to be a lack of concrete achievement in the learning of motor skills. Often the very skilled student is never dealt with.

In many teaching situations the grade is used as a threat to the student to sponsor the desire to achieve. As a result class time is spent testing instead of learning to play badminton. Programmed instruction was planned to avoid such a pitfall.

Traditionally and economically educators are geared to teach the masses. The AAHPER (2) booklet on programmed instruction painted a picture of large-scale education with the absence of the individualization of student instruction.

Schools are confronted with mass media education where great numbers of students can be taught

economically. As a result, the skills of the teacher and the individualization of student instruction are depleted, at best, reduced to an average method. (2:1)

In 1964, Evaul (50) wrote that indications for the technique of programmed learning would have a profound effect on education. Since 1964, the effect has not been profound. Some programs have been excellent while others have been very poor. The potential of programmed instruction as a teaching-learning technique is still to be tested in physical education. This testing will occur as more and more people experiment with it. The most effective use of this tool seems to be a supplement to classroom instruction. It can be used to provide for individual learning rates, as a remedial tool for deficient students, to gain more time for individual instruction, and as a device for handling large classes. Evaul listed three important uses of programmed instruction which can have advantages for health and physical education courses:

1. Enable class time to be spent almost exclusively in activity, discussion, or other learning experiences.
2. Enable large classes to be broken down with some students doing programmed instruction and others activity work.
3. Enable students to learn much on their own outside of class and thus develop a desire to learn more from the class instruction. (91:80)

CHAPTER II

REVIEW OF LITERATURE

A comprehensive review of the materials is organized according to the following areas related to programmed instruction: (1) early stages of programmed instruction, (2) evaluating a method of teaching, (3) individualized learning, (4) principles of programmed instruction, (5) steps of program writing, (6) programmed methods of instruction compared to traditional methods of instruction, (7) physical education and programmed instruction, (8) strengths and weaknesses of programmed instruction.

EARLY STAGES OF PROGRAMMED INSTRUCTION

Davies (45) wrote that interest in behavioral change with teaching machines and programmed learning began in 1958 in England and the United States. The teacher's role changed to that of controlling the learning process by stimulating and guiding the cognitive activity of each student. Learning did not have to take place in the presence of a teacher. Instead, control of a learning situation was attained by having each student experience a series of learning situations which continually guided him towards specific goals. Programming advocated that the effectiveness of the teacher

would be increased by allowing a shift in the allocation of teaching time from the presentation of routine and repetitious subject matter and the endless correcting of errors. B. F. Skinner called this process "white collar ditch digging" and advocated the guidance of the learning process on an individual basis. (56) Programmed learning was considered to be something unusual, an industrial revolution in education, that would enable educators to solve many of their problems. Davies reported that the peak of interest regarding programmed learning was reached in this country between 1961 and 1963. A sharp reaction against the whole movement immediately followed. Davies described the downfall in this way:

The trough of despair was reached in 1963 in America and in 1964 in the United Kingdom, and people began to say that the balloon had burst and that programmed learning was finished. (45:2)

Deterline, along with other advocates of programmed instruction, pointed out that too many would-be "programmers" assumed that the product, not the process, is what made the program.

These "Programmers" have confined their programming methodology simply to dividing existing test materials into frames containing a couple of sentences, erasing some words to produce the inevitable blank to be filled in, then calling the mess a program. (48:4)

Other programmers said that their program had been validated according to behavioral objectives. Few showed that this had been done systematically in deriving the

objectives or worried about the value of these objectives.

(57)

The challenge to the teacher and to education as a whole is to create experiences which assure that the student will learn. The responsibility of teachers is constantly to evaluate, reconstruct, and then to evaluate again. This must be done with complete honesty if one is sincerely interested in teaching. (67) Obviously such a procedure was not followed when the first rash of programs came out on the market.

EVALUATING A METHOD OF TEACHING

In order to evaluate a method, a teacher must know how effective the communication with students has been. Ofiesh said that modification and improvement must be based on knowing where, how, and why there has been failure in the communication process. "In order to find this out we have to listen to feedback from the student. Until the loop is closed, we will never really know whether learning has taken place." (67:4)

In doing educational research, teachers must test hypotheses and find out if they work. If they do not work they must be modified. Failure in education is a result of not knowing how knowledge is transmitted or how skills developed. "It is basically wrong, very wrong," said Ofiesh,

to assume the transmission of knowledge from the mouth of the teacher to the mind of the student--by osmosis as it were--without ever insuring that this is in fact the case. (67:3)

Programmed instruction requires a precise statement of goals. The instructor is forced to specify what he is attempting to teach and what it is he expects the student to learn. In other words the instructor cannot begin his task until he specifies the goals in behavioral terms. Silverman suggested that it was important for the teacher to be aware of behavior.

He specifies the goal and then analyzes the behavior, that is--the responses and the controlling stimuli which are involved. His program begins with behavior; it serves to modify behavior; and ends with a clearly defined measure of behavioral change. (75 6)

Craik specified that there are five important steps in writing a specific objective for programmed learning and they are found in the answers to the following questions:

1. Who is to perform?
2. What category of learning is involved?
3. What is the terminal behavior?
4. Under what conditions will it be demonstrated?
5. What degree or level of proficiency is to be met in order to succeed? (44:19)

Mager said there are three questions to answer in writing an objective:

1. What will the student be doing when he is demonstrating proficiency?

2. Under what conditions will this behavior occur?
3. What is the level of acceptable performance?
(23:23)

Pipe suggested that a good tip in writing behavioral objectives is to begin with an action word such as "cut," "test," "assemble," "add." Objectives must be written with care and considerable detail. "What will the student be doing when he is exhibiting this understanding?" "How thorough is 'thorough'?" Pipe emphasized the fact that words like "understand," "appreciate," and even "know" are meaningless to a programmer. (23:21,22)

Ultimately a programmer must feel satisfied with his objectives. In order to feel this way Stewart listed certain questions the programmer must ask self in specifying each objective or behavior:

1. What is the objective or behavior and how will I measure its achievement by the learner?
2. Why should the learner achieve this objective or behavior?
3. Once the learner has achieved the objective or behavior, what is he supposed to do with it?
4. How will the achievement of this objective or behavior help the student to have a happier, better, or more successful life? (78:11)

In addition Stewart (78) said that if one's answers to any of the questions above for any particular objective is "I don't know" or "nothing," then the individual had better think seriously about excluding that particular objective from the course.

Burns believed objectives are simply the verbal expression of what is to be attained in any type of learning situation. He stated several basic principles which guide the conceptualization and development processes. These principles are:

1. Learning is change in behavior. Failure to adhere to this principle will result in objectives that are phrased in general or vague terms.
2. Behavioral changes resulting from learning are observable and measurable. If behavioral changes cannot be seen and measured, then they must exist as "assumptions" or "fond expectation" which can neither be proven nor denied. Failure to pin-point or define behavioral learning automatically rules out any teacher's ability to plan for, guide, or measure learning.
3. Learning is an individual process. This principle rules out objectives that are not expressed from the individual's view point. Objectives expressed from society's, the school's or the teacher's point-of-view may be objectives of a society, a school or a teacher but not of the student learner.
4. Learning is varied. Research into how learners learn has failed to produce a best or universal method. What methods research has shown is that behaviors are acquired in a variety of ways and that each individual, through experience, discovers or fails to discover the optimal way in which he learns.
5. Everyone can learn. The commonly held concepts relating to non-learners that they are dumb, stupid, or incapable of learning will no longer serve as a rationale for failing to teach pupils. Experience has shown that most learners have a greater potential for achieving than they normally utilize and that pupil failures are most likely failures of the learning system rather than the learners. (40:1,2)

Young predicted that people will be greatly committed to education in the future and that it will be a continuous process for everyone. Gone will be the lock-step systems, grade levels, and differentiation between pre-school, elementary, junior, senior high and college. Gone will be the myth of one year's learning during one year. "The students will be able to move in and out of the educational programs as they need and want to." (85:3) Because of this, Young believed the drop-out problem would be eliminated. If a student is not profiting from the program, assistance in finding another will be available. Needs must be met.

Young also suggested that tomorrow's teachers will act as managers of learning resources and spend most of their time consulting with students. Grouping in the schools will be based on individual needs and each student will be in an individualized-multiple educational program. (35) Young said that at present we are prepared to help children with deprived backgrounds. Right now teachers have the skills and technology to use an individualized, multiple educational program which takes the best of each sub-system and matches it to each individual's needs. (85)

Some of the early studies in programmed instruction showed that programs supplement but do not replace conventional teaching, and that they are most effective when used as teaching aids rather than the core of a course of instruction. (59)

Deterline (47) stated that when a student's behavior is not guided and controlled much of his activity goes unreinforced or is followed by averse consequences. The student ends up not learning the subject matter and sometimes develops a "mental block" for that particular subject or for academic learning. Deterline emphasized the point that losing control of the student's behavior means that teachers cannot prevent undesirable learning; incorrect answers and emotional responses such as frustration and avoidance will occur. If the student's behavior is controlled, the acquiring of the desired response is insured and acquiring an undesirable behavior is prevented.

INDIVIDUALIZED LEARNING

"The essence of programmed instruction--whatever form it takes--is the INDIVIDUALIZATION of instruction and learning." (77:5) When asked the question, "What can programmed learning do that the human teacher can't do?" the answer is very often "Nothing." Since programs are written by teachers they do the same thing an individual teacher does but as Lambert said, "The program is a private tutor working under the supervision of the classroom teacher." (16:405)

Programmed instruction serves two major roles in education: it is a method of instruction and a research tool. (30) It must be emphasized that present day programs are tools to be used by teachers and should never replace

teachers, discussions, seminars, or the use of visual aids. "Programs, like tests, can be the focal points around which courses of study are organized." (38:1) The idea of programming is to convert individual differences in achievement into differences of time. The rapid learner will learn more in the long run because more programs will be completed. Success is determined by the learner finishing (pass) or not finishing (fail) instead of the conventional method of the symbol, A-F. (38)

Branson (35) advocated that grading systems approximating the normal curve are not acceptable criteria for comparison of methods of instruction. He stressed that measured achievement of specific levels of knowledge or skill is an acceptable criterion since each person in the class has the opportunity to meet the prescribed specifications, regardless of how well or poorly other classmates do. "Criterion referenced measures of performance should be used almost exclusively to evaluate instruction and students." (35:36)

When one compares a program with a textbook, a program will require more from the student than a text. A program is text-constructed to be almost error free which makes the student respond correctly and this yields immediate reinforcement. (2)

The most important contribution of programmed instruction is the concept that instruction should be

designed and presented in order to lead to intended outcomes and if these outcomes are not attained the instruction and not the learner is deficient. (65)

Goldberg and Briggs cited the functions of feedback as being very important:

1. It may provide information concerning the adequacy of responses made.
2. It may serve as a reinforcement and reward for responses.
3. It may have a motivating effect on performance.
4. It may be used to direct the next step to be taken in the learning process. (27:184)

In physical education classes feedback is not always present unless the student knows the desired outcome. Immediate feedback for motor skills is provided when a physical task is the called for performance. This can be checked by the performer, partner, or teacher. (2)

The reinforcement theory must be applied in programmed learning because the student immediately knows the outcome of the response or motor act. Reinforcement refers to certain environmental events which strengthen behavior. (75) Lysaught and Williams (2) assumed that reinforcement should inspire the student to be aware at all times that he is learning. Reinforcement is a persuasion method which helps the learning experience to be enjoyable and thus motivates the student to keep wanting to learn. Lysaught and Williams have proposed a reinforcement theory containing

generalizations that should be considered hypotheses rather than absolute laws. Following are their nine hypotheses:

An individual learns or changes the way he acts by observing the consequences of his actions.

Consequences that strengthen the likelihood of repetition of an act, one calls reinforcement.

The more quickly reinforcement follows the desired performance, the more likely the behavior will be repeated.

The more often reinforcement occurs, the more likely the student will repeat the act.

Absence or even delay of reinforcement following an action weakens the probability that the act will be repeated.

Intermittent reinforcement of an act increases the length of time a student will persist at a task without further reinforcement.

The learning behavior of a student can be developed or shaped gradually by differential reinforcement--that is, by reinforcing those behaviors which should be repeated and by withholding reinforcement following undesired acts.

In addition to making repetition of an act more probable, reinforcement increases a student's activity, quickens his pace, and heightens his interest in learning. These may be called the motivational effects of reinforcement.

A student's behavior can be developed into a complex pattern by shaping the simple elements of the pattern and combining them into a chainlike sequence.
(2:8)

The persuasion method which Lysaught and Williams wrote about is Stimulus-Response reinforcement. The S-R sequence is chainlike in that it is built by immediate reinforcement and another link is added when the correct

response is made to specific stimuli. It is then immediately reinforced.

In S-R reinforcement there are three essentials for learning as described by Silverman:

1. The learner must make the response he is to learn. He learns what he does.
2. The responses must be strengthened. Learning progresses as the responses in question are reinforced and increase in probability.
3. The responses should be put under the control of particular stimuli; these stimuli will set the occasion for the occurrence of the responses.
(76:3)

In his discussion of how we learn, Skinner believed that performance is the effect of learning on behavior and is therefore the external sign that learning has occurred. Gagne (76) stated that the kind of change called learning shows up as a change in performance and the measurement in learning is made by comparing what performance was possible before the individual was placed in a learning situation and what performance can be exhibited after such an experience. Gibbs (54) reemphasized the fact that a change in performance is what leads to the conclusion that learning has occurred.

In physical education activities much skill learning is being programmed into tasks. A task consists of a set of behaviors whose elements are operants. Chains consist of sequences of operants where the response of one operant is the stimulus of the succeeding one. Rath defined operant

behavior in the following way: "An operant is a rather small elemental behavior which is a necessary, but not sufficient, condition for the production of a specified goal (response)." (70:114) In operant conditioning a reinforcer immediately follows a response and the reinforcer is an event or object that increases the rate of a response which it follows. (30) Programmed learning is a type of operant behavior, especially when learning a motor skill by tasks.

Silverman (75) wrote that three of the most important variables of learning are (1) the variable of reinforcement, (2) the response variable, and (3) the variable of successive approximations. Reinforcements are the environmental events which strengthen behavior by confirming a response. "Learning by doing" refers to the response variable. The teacher tries to get these correct responses by reinforcing gradual approximations of the desired response. Finally the desired behavior emerges.

Although some behavioral modification theory has been based upon animal experimentation, in education there is little specific information which comes from a pigeon or rat pressing a lever. Silverman (75) said that the variables which are effective in the animal laboratory do not directly indicate relevant classroom variables. This is because the human is verbal, which in itself complicates the transfer of animal laboratory principles to human learning. Much human behavior is covert, which means that many responses occur

which are not easily observable. Requiring certain overt responses does not account for the learner's covert behavior. Critics of programmed learning question whether the S-R analysis to human learning is appropriate.

In summarizing it can be said that programmed instruction may not be able to do any more than the teacher but if developed properly it works as a private tutor. It is a unique tool for teaching but should never replace the teacher. It also accommodates each type of learner because the rapid learner will do more programs while the slower learner will progress at his own rate.

Immediate feedback is the premise of programmed instruction. Through basic Skinnerian technique the correct responses are gradually shaped through reinforcement until the desired behavior has been established. Therefore the classroom teacher has only to set up techniques and situations which will provide the learner with immediate feedback.

PRINCIPLES OF PROGRAMMED INSTRUCTION

Dr. B. F. Skinner of Harvard said that learning is conditioning, opposing Dr. Jerome Bruner's statement that learning is cognitive. (68)

In analyzing the two theories Parker stated that it is very apparent that there are two distinct processes of learning: skill-getting and skill-using.

In skill-getting, the process is one of training or conditioning: stimulus-response-feedback-reinforcement-redirection. In skill-using, the process is one of educating or educing cognitive creativity. Creativity is here defined as "the act of seeking out, trying out, and combining knowledge in ways new to the learner." (68:5)

The learner acquires responses which are the ones which the teacher is trying to establish. These correct responses are gradually "shaped" or successively approximated until the terminal or desired behavior is established. Through this series of successive approximations of the desired response the correct response is finally elicited and reinforced. (75) In programmed instruction, reinforcement is provided to the human by confirming responses. By informing the learner that the response is correct, the program is reinforcing the response which led to being correct.

Programming, as the term is currently used, is largely a linear concept of the presentation of printed material in planned sequences with or without pictorial material, with or without audio and with or without branching materials based upon a limited anticipation of the learner's responses. (68:9)

The teacher can use programmed instructional materials as an efficient tool for effective learning. The object of programmed learning is to guide the learner through a series of carefully sequenced, planned, learning situations. Because the learner had to interact with these situations specific learning outcomes are achieved. This is accomplished as a small portion of learning matter is presented which must be responded to by the learner in an overt

manner. In the classroom this is usually a written response which causes the learner to be thinking continuously about the material being presented. (56) Programmed materials are arranged so that the correct response is conveniently available and so that the learner can check the correctness of the response.

This unit of information along with the questions is called a frame while the whole content of the instructional book is called a program. Questions can be in the form of blank spaces to be filled in by the student or can provide a multiple choice of answers.

In writing a program the programmer must have mastery of the subject matter beyond the level which is being programmed and the material must be prepared one section at a time, by one person, with the support of others who have checked the program for learning flaws, understand the principles of learning and are specialists in the field of subject matter.

STEPS OF PROGRAM WRITING

Pipe (23) said that the three major steps of program writing are: I Preparation, II Writing the Program, and III Testing and Revision.

Stage I consists of six steps:

1. Select your topic.
2. Write a general statement.

3. Define your objectives in behavioral terms.
4. Define prerequisite skills, again in behavioral terms.
5. Write a criterion test.
6. Develop the content outline. (23:19)

The criterion test is written primarily to determine if the objectives are measurable and tests whether the student has attained the specific behavioral goal. This criterion test also serves as a valuable research tool to measure student achievement of specified objectives, to establish the behavior criteria for minimum acceptable performance, and to act as an instrument for evaluation of course materials during their production. (69)

With well-designed criteria frames the student, a partner, or an independent observer can objectively evaluate each frame level. When a good frame is written the description is so accurate as to what is to be accomplished that there is no doubt in the thinking of the evaluator. Student feedback in the pilot stages is very valuable in "ironing out the kinks" of the program.

In developing the content outline there are a number of questions the programmer should ask:

Am I using the most logical approach?

Could I present this information in a different order and give the student new insight?

Does each step build on what went before or on what the student already knows?

Is each step listed necessary to attain the objective(s)?

Are there enough steps to attain the objective(s)?

Which of these points needs most emphasis?

What is interesting but not essential?

Should it be included to keep the student's attention?

Which points are hardest to get across?

What needs extra practice?

Where should reviews be inserted? (23:29)

Keeping these questions in mind the programmer will then tackle the phases of a program.

1. An introduction that describes in familiar terms what is to be accomplished in this section of the program.
2. A review of any concepts that are essential to the task in hand. This review might call on the student to demonstrate certain important skills, or it might merely recall ideas for him in a summary.
3. The step-by-step development of new concepts, one at a time, in language which does not interrupt communication.
4. The "weaning" stage in which the student gradually is encouraged to display the full competence called for by the objectives.
5. A final summary and criterion test. (23:34)

A survey by the Center for Programmed Instruction included a group of histories that had used programmed instruction in the public schools of the United States. The histories showed a diversity of initial actions and unique usage patterns. "The case histories are intended to encourage

just such diversity--rather than pretend that there is, or should be, any single way to use programmed materials."

(55:9)

After the program is written it must be validated and evaluated to discover whether it meets an acceptable level of achievement. The whole emphasis in the programming of behavior is placed upon the realization of objectives through successful performance or achievement. Davies (45) suggested that the resulting behaviors are concrete rather than abstract, are measurable and definable, and consist of knowledge, skills, and attitudes actually wanted and desired by the teacher.

In perfecting the program which should be oriented toward the student, Pipe (23) said that the programmer has not finished his task until "Yes" is the response to the question, "Does it work?" This can only be done by testing the program on members of the population for which it was intended. Pipe emphasized the point that when the program fails in its purpose, the programmer must make revisions until the product does work. There is no room for alibis such as, "The student is stupid," or "He is not paying attention." The point is that when a program does not work, it is the programmer's fault.

The AAHPER's booklet on programmed instruction estimates that a good program requires 200 professional man-hours for each one hour of student programmed material. The

initial program is subjected to student scrutiny, it is analyzed and edited and revised many times until the majority of students are able to progress through the program successfully. (2)

In summary, Burns believed there are six important reasons why the majority of students find learning by programmed methods a rewarding experience. These are:

1. Programs are scientifically designed to produce learning. Program development rests on the sound basis of incorporating into a single method the concepts of "how people learn."
2. Traditional teaching methods do not always result in rewarding experiences. For instance, at least twenty-five percent of students are condemned to failure. Ninety to ninety-five percent of students using programs should be successful.
3. Programed learning provides a functional means of caring for individual needs, a topic more often preached about than cared for in present day education.
4. Programs are developed for learning needs, not teacher needs. The learner, his attitudes, his aspirations, and his abilities are of primary concern.
5. Programs reduce learning tension and anxiety because of their "small step" design.
6. Programs challenge the learner, by requiring mental alertness through a system of continuous, active responses. (38:5)

PHYSICAL EDUCATION AND PROGRAMMED INSTRUCTION

Teaching is most effective when it can be geared to the "singular requirement" of each learner. (2)

Kenneth Penman (21) wrote one of the first programmed texts for college physical education in 1964 entitled Programmed Instruction Physical Education for College Students. He designed the book for basic physical education courses on an introductory level. At the beginning of each unit Penman specifically stated his objective in behavioral terms. He covered units including the reasons for fitness, physiological bases for fitness, why a person should strive to improve his physical education practices, methods of learning new motor skills, ways of determining motivation and methods of obtaining strength and endurance--all leading to ways toward developing a positive attitude in designing a daily program in physical activity.

Langsdorf (96) used Penman's textbook in 1969 to determine if a textbook on physical education values would positively influence the development of favorable attitudes toward physical education and physical exercise. In experimenting with the text, his subjects were two college freshmen men's physical activity classes composed of young men who had poor attitudes toward physical education, poor attitudes toward regular exercise, or poor attitudes in both areas. These poor attitudes were determined by a score of 100 or less on Form A of the Wear Physical Education Attitude Inventory and a score of 47 or less on Form A of the Bassett Regular Exercise Attitude Inventory. Both the experimental and control classes were instructed by Langsdorf in beginning

wrestling. The experimental class was required to read Penman's (21) Programmed Instruction Physical Education for College Students on their own time and were given short tests on the content of the text to make sure they were reading it, while the control class had no book and worked only on the fundamentals of wrestling. Near the end of the semester the groups in each class with poor attitudes were given Form B of the Wear and Bassett scales. Using the t test for statistical analysis the results of the pre-attitude tests scores compared to the post-attitude scores were statistically significant within each group. But there was no statistically significant difference between the control and experimental groups taking the Wear tests on attitude toward physical education, or between groups on the Bassett tests on attitude toward regular exercise.

Imel, (58) who was interested in time needed for administering a program, constructed a programmed learning unit covering the principles of equilibrium, levers, motion, and Newton's laws. The mean time for completion ranged from 12.5 to 16.8 minutes. Students at two universities tested immediately before and after the unit on levers showed a significant gain in accuracy at the .05 level and most students completed three to five frames per minute.

A more recent text was written in 1969 by Dana Clark. (5) His purpose was to cover what he called the often neglected theoretical area of sport which included the

knowledge and understanding of the rules, strategy, and systems of play. The text was written for the purpose of the student using the material without help from the instructor.

Units in archery, badminton, basketball, bowling, golf, gymnastics, handball, physical conditioning, soccer, softball, tennis, touch football, track and field, volleyball, and wrestling were all presented in linear form. Through building knowledge with small steps, the student was eventually able to understand some of the more difficult concepts of sports theory. The student was required to make an overt response by writing the correct answer and if he wrote down the wrong answer, he was asked to draw a line through that answer and write the correct answer next to it. The author recommended going through the unit a second time before the student took a test on the unit which is provided with the text.

A Program in Self-Instruction for Officiating DGWS Volleyball Rules was written in 1965 by Mildred J. Barnes.

(3) Her purpose in designing the programmed text was to help prospective officials learn the rules and technique of officiating so that they could earn a DGWS-OSA volleyball officiating rating or for officials who wished to review the rules before attempting to renew a rating. Her program first stated rules. Then the student learned them in descriptive game-like situations in which decision making

about specific rules had to be done just as it is done in actual officiating. At the end of the program Barnes believed the student should be prepared to pass the written DGWS-OSA volleyball examination.

This specific program can be used by students in the classroom during the regular period for instruction. It can also be used with teacher assistance or assigned as homework (which allows more time for practical experience in class). In other instances the course may not start until all have completed the program outside of class so that all of the class time can be spent on practical work.

To validate Barnes' study, three different universities experimented with the program and revisions were made. In each institution students who used the program obtained higher scores on the direction to timers, scorers and line-men than those students who did not use the program. The error rate was within 10 percent (ratio of incorrect answers to total number of frames).

Hingst and McKee (13) used programmed learning as a self-study procedure for the procedures, etiquette, and elementary rules of golf. Its purpose was to free the teacher from taking class time to lecture which the instructors felt could better be spent learning the skills of golf.

In this particular program the student proceeded at an individual rate and re-read as much of the content as was wished before selecting an answer. Information was given

and there were questions to answer concerning the material. Included in the program was a list of specific objectives at the beginning of each unit and a major review section at the conclusion of each unit. Once selecting the answer the student looked to the left column for immediate feedback as to the correctness of the response. The authors designed each unit to be completed in 50 to 60 minutes by 95 percent of the student population and stated that errors should decrease after the students become accustomed to use of the programmed material. They recommended that the instructor collect the programs on occasion to check the students' progress and give 5 to 10 question quizzes and short discussion at the beginning of a class period. The program itself was not intended to be used as an evaluation tool.

AAHPER's (2) book on programmed instruction stated that one of the earliest programs in skill learning in this country is the American Red Cross' assembly line method of station teaching. There is a specific behavioral objective to be attained at each station before the swimmer can progress to the next station. Once the learner has performed at the level expected he/she keeps moving on until the completion of the beginner's test.

Caryle Feddler (91) wrote one of the first self-instructing programs for skill learning entitled Programmed Circuit Bowling. He used the mediums of 35 mm. colored slides, a written programmed manual including diagrams,

tests, and thermofax materials with an overhead projector. The effectiveness of the program was evaluated empirically using two 7th-grade and three 8th-grade junior high school girls ranging in age from twelve to fourteen. They had been randomly selected, had had some experience with bowling but had never received any formal instruction. Feddler's program used an arrangement of ten circuit stations in an all purpose room along with the slide and overhead projectors. The subjects were instructed in the use of the projectors, left with the programmed manual and instructed to proceed following the directions in the manual. The ten circuits consisted of (1) Introduction and History, (2) Equipment and Safety, (3) Ball Selection and Grip Type, (4) Stance and Approach, (5) Deliveries and Aim, (6) Spares and Mental Attitude, (7) Faults and Aids, (8) Rules and Etiquette, (9) Vocabulary and Technical Terms, and (10) Scoring, Handicap and Peterson Points. The subject had to pass a test over the circuit at which she was stationed before she could move to a new circuit. When the ten circuits had been completed, the subject took a final test covering all ten circuits. Then all subjects were taken to a bowling alley by the investigator for empirical evaluation of the effectiveness of the teaching device.

Feddler found that his teaching device did teach bowling through programmed circuit instruction. He said,

The programmed circuit bowling aid allowed for individual differences, provided motivation and interest for the subjects and created an entirely different atmosphere of learning than is generally found in a physical education class. (91:iii)

Another study entitled "Shaping Behavior in Bowling" was done by Peters (22) in 1966. She compared her programmed method in experimental classes with that of classes taught by the traditional method. Results showed that differences, significant at the .01 level, were found in favor of the experimental group. Season average and first ball average scores were used as the measurement variables.

Canada has been known for its production of strong badminton players who have progressed through the country's strong junior programs. The National Test Program (19) was developed in 1967 and followed the examples of the Red Cross Society and the Canadian Figure Skating Association in developing an enormous national testing program for the purpose of improving teaching methods. The National Test Program of Badminton in Canada has certified over 300 coaches and 15,000 junior players in every Canadian province plus the North West and Yukon Territories. The program consists of eight tests on etiquette, technique, theory, and rules which are given by a certified coach. A candidate cannot go on to a higher test until he has passed the preceding one. He is programmed from task to task.

Cougan (43) experimented with the "contract" method of teaching in grades six through eight in Grand Island, New

York. The contracts were progressions of difficulty in skills arranged between student and teacher in which the student agreed to accept increased responsibility for learning without constant supervision. The author programmed seven contracts by which the student could see progress by advancing to another contract. Through the contract system Cougan felt that more of the students were aware of and interested in the game of badminton than would be otherwise.

Connor (42) developed self-instructional learning packages in badminton with paper and pencil for classes at Tarrant County Junior College, Hurst, Texas. The student attempted to answer a pre-test, and if it showed that there was a good understanding of the material, the remainder of the package was omitted. If all of the questions were not answered correctly, the student would go through the written material and exercises in the package. The established pattern is for the student to read, respond, correct, and if necessary review the material in the package and then take a post-test.

Connor has developed instructional packages in faults, errors, general rules, court areas, strategy and tactics, service and receiving positions, history and values, and etiquette in badminton.

Stutters (101) did a study with the primary purpose of using programmed instruction to learn the ideas in Beginning Badminton by Loren Lutz. (97) These ideas dealt

with the teaching of badminton skills. A Stutters' secondary purpose was to examine the effects of motor ability and academic aptitude on the learning of badminton skills and to investigate interaction effects between the treatments, motor ability, and academic aptitude.

Ninety-nine male students in four beginning badminton classes were the subjects. Two classes were taught by the conventional method of teaching and two classes received instruction through a programmed text without an instructor. The control group used the textbook, Badminton, by Margaret Varner as required reading and the experimental group used Lutz's book.

Stutters found there was no significant difference in skill levels achieved between the classes using conventional instruction and those using programmed instruction. Furthermore, academic aptitude had no significant effect on the achievement of specific skills in badminton. Finally, the author concluded that there were no significant interaction effects between the two methods employed, academic aptitude, and motor ability either as a total combination or paired in any possible manner. Stutters stated that it appeared that an uncontrolled variable or variables exerted an influence on the study. Other studies with programming in academic areas have found academic aptitude to be an important factor.

Two studies have been done in the area of tennis using the technique of progressive tasks.

Farrell (90) designed a progressive task-solving program as an instructional tool for basic instruction in the tennis forehand and backhand drives. The technique of programmed instruction was used on two experimental classes who used "The Progressive Task-Solving Program for the Tennis Forehand and Backhand Drives," and two control classes followed the traditional teacher-directed method.

The results of the study showed that the experimental group was found through student questionnaires to have been more actively engaged mentally and to an equal degree physically when compared with the control students. They were timed during several of the class periods by an outside observer. Because students in the experimental group could progress at their own rate, it would seem that the highly skilled students could improve in skill. However, the highly skilled students in the control group did not make significant gains in skill. The more poorly skilled student in both the experimental and control groups made significant gains on both skill tests. Farrell believed that the training methods in the experimental program were successful to a degree in guiding the students toward the attainment of long, low drives.

Neuman and Singer (66) wrote a programmed text for self-instruction in beginning tennis. They experimented

with two college service classes of twenty students each. One class was taught in a traditional manner and one class by a programmed method consisting of fourteen lessons. The results of the study showed that there was no significant difference in the general skill level of the two groups as measured by the Hewitt Revised Dyer Backboard Tennis Test. The traditionally taught groups did improve significantly in general skills in comparison to the programmed group and the programmed group received better subjective rating scores on form than did the traditional group. The authors allowed progression to the more advanced steps only upon complete mastery of the elementary steps. The instructor was present to help with interpretation.

The task exercises were to be attempted two times and if the subject did not progress well, it was necessary to examine a check list of errors, demonstrate the skill to the instructor and discuss the errors, revise the patterns, and continue practicing.

The program contained sections on ball control, forehand, and serve, and they involved much partner work and demonstration of task proficiency to the instructor.

Fuertiges (92) conducted a study to determine if there was any difference between two instructional methods in achieving specific developmental aspects in tennis skills, knowledges, and attitudes. He designed a programmed learning text and adopted a traditional instructional method.

Findings revealed no significant difference between the two groups for both knowledge and attitudes. Two sections did improve in skill at a statistically significant level and two did not. The author concluded that the attitude variable did not appear to be affected by either instructional method, that additional instructional time and unlimited practice is necessary to achieve a more noticeable level of skill development in specific tennis strokes, and that it may be possible to teach tennis knowledge effectively by both the programmed and conventional methods.

Adler (3) has attempted the only intrinsic (branching program) for skill learning in golf. He wrote a series of programmed lessons for the iron-swing and then tested the program in a college program compared to that of a traditional class of instruction. The author was interested in finding a technique that would be applicable to the heterogeneous population of a typical college class.

The experimental group learned the iron-swing by reading the programmed material and practicing with instructor help available on request or when it seemed necessary. The control class learned the iron-swing by lecture, demonstration, and practice with help from the instructor.

A three-way analysis of variance indicated that while the experimental group improved significantly and at the .01 level the control group did not. There was no significant difference between the two groups in the initial Benson Five

Iron Test but the final test showed that the experimental group had a significantly better score at the .01 level. The experimental subjects were strongly in favor of the use of programmed lessons in teaching golf.

In another golf study, Virginia Raye Holt (94) compared the traditional method vs. the programmed instructional method on the learning of elementary golf skills as measured by performance on a pitch-and-run skill test. She constructed her own unit of programmed materials of selected golf skills. Both methods turned out to be equally effective. Through an analysis of variance technique she concluded that teacher differences alone are apparently responsible for very little variability on the achievement of elementary golf skills. The calculated F ratio showed that methods and teachers operate independently of each other and approximately the same differences between the two methods exist regardless of the influence of teachers.

The area of gymnastics has had two studies developed in programmed learning. Johnson (15) developed an illustrated linear programmed text which could be used to teach the basic gymnastic skills to college men majoring in physical education. Included were 120 basic gymnastic stunts which were divided into four 5-stunt routines on six events which included mats, side horse, still rings, low horizontal bar, parallel bars, and trampoline.

The author evaluated the effectiveness of the programmed instruction by comparing it with conventional teacher-directed methods. Johnson concluded from an analysis of covariance that, within the limitations of the study, the use of a programmed text was a more effective way in teaching gymnastics to physical education majors in terms of the number of routines checked and the quality of performance on routines (evaluated by an independent observer) than the conventional teacher-directed methods.

Carroll (41) used a written self-instructional program for learning the cartwheel in gymnastics. The program was constructed and then evaluated by comparison with a traditional method specific to each instructor involved. The program consisted of small, ordered, sequential steps along with diagrams for learning the cartwheel. Subjects were college women. A pre- and post-test showed that both methods were equally effective for the components tested and for the time allowed for instruction. Carroll surmised that previous experience affected scores on the post-test. She also used measures consisting of a subjective rating of the handstand and a maximum balance time administered after cartwheel instruction. She concluded that these were adequate measures for assessing cartwheel performance.

The principles of programmed learning were applied by Van Tassel (81) to construct a written program of self-instruction for learning the lay-up shot in basketball.

College women were the subjects in five classes. Each class was randomly divided into two groups. One group received the written program for instruction on the layup shot and the other group received instruction by the traditional method. Testing of the lay up shot indicated that there was no significant difference between the two methods of instruction.

Folk dancing has also explored the feasibility of instruction by programmed instruction. Litherland (62) constructed a written and audio program of self-instruction, utilized as a teaching progression for learning to perform the folk dance, "Harmonica." She then compared the effectiveness of the traditional vs. the self-instructional method. The subjects were college women enrolled in either a beginning folk dance class or a beginning modern dance class. No significant difference existed between the mean performance scores of these two classes or in the mean times in which the groups learned the folk dance.

The elements of modern dance were utilized in a program using a vertical method with the answers appearing on the last page of each lesson by Shirley Mell. (17) She determined the effectiveness of this auto-instructional method through empirical observation with fifteen girls in the 9th and 10th grades. The skills included were plie, relivie, turns, swings, dance walk, dance run, and sustained and percussive movements. These were all subjectively rated

on a 5-point scale. Mell concluded that the students did learn the basic fundamentals of modern dance and were able to progress at their own rates. She felt that the drawings were the determining factor in the learning of gross motor skills and that the use of the programmed material as it stands demands supplementary aid from the teacher.

In 1965 Veach (82) developed a self-instructional program for football rules. He compared his programmed text to a conventional book in the learning of football rules. Both groups showed significant gains in learning over the pre-test. The group which used the program was significantly superior in performance on the post-test to the textbook group. The coaching staff noted a reduction in major penalties during the season. Favorable reaction was received from the students, and the author stated that the program was as effective as the instructor presenting the rules. He claimed that the advantage of programmed rules was with large classes and limited facilities--part of the class could be working on the program while others participated in the activity.

A football coach, Dupont, (49) did action research with the programmed learning of football plays. Instead of having his players take home the plays and memorize them, he used programmed instruction. He believed that memorizing resulted in a waste of time. Learning had been based purely upon memorization rather than on comprehension of theory.

He felt that comprehension of theory could improve learning efficiency.

Dupont's particular system of programming taught the theory of the offensive system. The program started out with simple and familiar items with clues in the beginning which are gradually removed. The steps were kept small and were carefully and logically sequenced. With these techniques he taught the three-number offensive system, the first digit of which designated formation, the second digit the series, and the third digit the hole or point of attack.

A unique feature of the program was that it could be planned according to position. For example, the backfield can omit the parts designed for the linesmen. Team play and organization were studied by all players regardless of their position.

Neuman's (99) study was undertaken to determine the effect of a self-instructional program of badminton rules upon the knowledge and skill achieved by a group of beginning badminton players. The experimental group learned badminton rules through a program written by Gail Hennis and another group was instructed through the traditional class method.

The results of Neuman's study showed that programmed instruction was as effective as class presentation for knowledge of rules but less effective for total badminton knowledge. The method of rules instruction did not affect

playing ability. Student reaction to programmed instruction was favorable.

"A Comparison of the Effect of Ordered and Scrambled Sequential Techniques in Programmed Tennis Rules for Beginning Classes" was completed in 1969 by Mariello. (98) She constructed linear programmed material with a horizontal ordered sequence and a vertical scrambled sequence which proved to be valid according to standards of the American Institute for Research. Students in four beginning tennis classes were assigned to ordered sequence or scrambled sequence groups on the basis of the rules pre-test, completed the rules manual in one week and then were post-tested.

Indications were that the constructed program was an effective method of learning tennis rules. Neither method of sequencing was more effective in relation to learning, but the ordered sequence required significantly less time to complete than the scrambled sequence. The ordered sequence produced fewer program errors. The programmed instruction of tennis rules eliminated the necessity of initial teaching of tennis rules in the regular class situation.

Lutz (97) constructed a programmed textbook in badminton to determine the influence of the programmed instruction course on the achievement of specific knowledge in badminton in a basic college badminton activity course.

Specifically the study was set up to determine if there was any significant difference between students who are taught by a homework programmed instruction method, a lecture method, a conventional textbook method, or a classroom-contained programmed instruction method. Lutz, in a very general and questionable study reported the following findings:

1. There was no significant difference between the textbook method of achieving knowledge of badminton and the homework programmed textbook method at the .05 level of significance; however, the homework programmed textbook method was significantly better than the textbook method at the .20 level.
2. There was no significant difference between the textbook method of achieving knowledge of badminton and the classroom contained programmed textbook method at the .05 level of confidence. There was no significant difference at the .20 level.
3. The lecture method of achieving knowledge of badminton showed no significant difference over the homework programmed textbook method at the .05 level of significance. There was no significant difference at the .20 level.
4. The homework programmed textbook method of achieving knowledge of badminton was significantly better than the classroom contained programmed textbook method at the .05 level of significance. There was no significant difference at the .20 level.
5. Further, there was no significant difference between the lecture method of achieving knowledge of badminton and the classroom contained programmed textbook method at the .05 level of significance. There was no significant difference at the .20 level. (97:38,39)

The author concluded that programmed instruction is an efficient means of dispensing knowledge and its self-teaching nature saves valuable class time for skill instruction.

The studies cited here generally conclude that teaching is most effective when it can be geared to the "singular requirement" of each learner. (1)

PROGRAMMED METHODS OF INSTRUCTION COMPARED
TO TRADITIONAL METHODS OF INSTRUCTION

Shimabukuro (26) discussed the differences between social interaction in the conventional instructional situation and programmed learning situation. In the traditional classroom setting the teacher gives positive or negative reinforcement through discussions, group drill, recitation sessions, or through individual help. This social interaction of the teacher is eliminated in programmed instruction because the reinforcement is built into the program. A good program uses reinforcement with a degree of precision, speed, and frequency which teachers cannot possibly attain and this is guaranteed for every learner in the classroom. But the reinforcement provided by programmed instruction is meant to associate a specific response to a specific stimulus. Shimabukuro (26) concluded that programmed instruction is infinitely more efficient than teacher-mediated instruction in the exercise of this kind of reinforcement. Yet Shimabukuro believes modern educators are firmly committed to the needs of mental hygiene and the development of social maturity which programmed learning neglects. Social interaction is at a minimum.

Mosston (18) described the "command" style as essentially teacher demonstration, explanation, student execution or imitation, and finally teacher evaluation. "The closer the student is to the model the more approval and higher grade he achieves," said Mosston. (18) He asked a question regarding the ever-evolving purpose of American education, that of individual development.

Is it not true that in most physical education classes one observes a fairly large number of students? Is it not true that the students attending the same class are of an incredible variety of physical abilities? Are they not held back by a range of performance limitations in agility, strength, flexibility, coordination, and the like? Do they not, moreover, represent the whole spectrum of human temperament and readiness? Yet, this motly crew are expected to respond like one man to a single stimulus, to adhere to a single rhythm, to attempt performance fashioned by a single standard, and to try their best to attain the standards determined by one person.

Does this make sense? Does this way of teaching movement help reach the desired goal of individualized development and learning? (18:27)

Mosston advocated that the students be required to execute the movement tasks on their own, which will create opportunities for new relationships between the teacher and the students and permits the teacher to develop and assume a new role while the students enter a new phase of self-development. Learning becomes self-directed, which may suit best the individual's ability, temperament, and aspirations. The teacher is also freed for individual corrections or individual reinforcement. In the "task" style of teaching

there is a place for each and every student. Mosston observed that students who rarely participate with any degree of zest or enjoyment and usually drift away from most activities are slowly drawn back to the class when the task style of teaching is used. The range of tasks provides a place for students which is recognized and accepted by both peers and the teacher. Mosston also observed that when a class learns to be more self-reliant, the discipline problems in large classes are reduced, and learning and accomplishment increase.

Mosston also proposed that the evaluation variable be relegated to the student. Through reciprocal teaching each partner has a personal tutor who is supplied with information about the rights and wrongs of the given task. A task suited to individual programming which can be measured quantitatively can challenge the student to self-evaluation which offers immediate visible results. This carefully sequenced design of tasks is similar to the concept of programmed learning. "Small tasks must be selected and arranged in such a sequence that most learners will reach the target after executing all the tasks" according to Mosston. (18:128)

The literature showed that the teacher who used individual programs must learn to make behavioral adjustments. Some teachers develop a sense of anxiety because they feel a loss of class control and a reduction in verbal

behavior. Mosston wrote that there are many moments of silence when there is no need for the teacher to say anything which in turn gives the teacher a chance to observe individual students and communicate with individuals while the rest of the group is engaged in individual learning experiences.

STRENGTHS AND WEAKNESSES OF PROGRAMMED TEACHING

Hoover (14) presented an up-to-date analysis of the strengths and weaknesses of programmed teaching as follows:

Strengths of Programmed Teaching

1. Instructional programming necessitates the identification and analysis of specific pupil behaviors deemed necessary for learning. This has been recognized as one of the greatest advantages of instructional programming, as instructional goals too often have been too complex for effective use.
2. Learning is systematically reinforced. This simply means that, once a desired behavior has been performed, the learner is made aware of his progress immediately following his response. Moreover, by arranging for a high degree of correct responses, psychological "punishment" (resulting from the accumulation of errors) is minimized.
3. Learning progresses from simple to more complex relationships. In another context, this is a way of saying that learning proceeds from the known to the unknown.
4. Learning is individualized and permits the student to progress at his own rate.
5. Instructional programming enables the student to progress independently of the teacher. This is especially valuable when other students need

immediate attention apart from the program.
(14:290)

Weaknesses of Programmed Teaching

1. Despite claims to the contrary, most instructional programs emphasize the acquisition of knowledge only. Relatively few programs have been developed for effective problem solving.
2. Programmed instruction does not provide for group interaction and socialization.
3. The technique of permitting the learner to progress at his own individual rate poses a host of problems. For example, how can a teacher possibly keep track of 35 or 40 all at different points of progress? How may classrooms be equipped with a sufficient number and variety of instructional programs to accommodate the needs of all?
4. Closely associated with the individualizing feature of instructional programming, along with the process of minimizing errors, is the problem of student evaluation. While it has long been recognized that a pupil, ideally, should be evaluated in terms of his own past performance, in actual practice most secondary students have been evaluated in terms of group performance. This demands an entirely new approach to the problem.
5. Instructional programming stresses either right or wrong responses. Relatively little provision is made for the various "shades of gray" which characterize so much of the learning experience. Furthermore, little provision is made for a student's own "original" way of looking at a particular problem.
6. Basic to instructional programming is a particular psychological theory of learning, known as association, reward, or reinforcement. Other equally acceptable theories of learning exist. Among them is the well known field of pattern theory. (14:291)

CHAPTER III

PROCEDURE

This study was undertaken to determine the effectiveness of a programmed instructional method of teaching beginning, intermediate, and advanced badminton skills in comparison to a traditional method of teaching. The subjects were sophomore, junior, and senior girls who attend the New Trier West High School in Northfield, Illinois. The students are required by the school board to take physical education every day for four years. At New Trier the curriculum is set up on an elective basis after the freshman year. All of the subjects in this study elected to take badminton.

The procedure used in this study is divided into seven major areas: (1) selection of subjects, (2) assignment of instructors to classes, (3) assignment of classes to treatments, (4) construction of programmed instruction of badminton skills, (5) selection and administration of measurement tools, (6) class procedure and implementation of the two instructional programs, and (7) treatment of data.

SELECTION OF SUBJECTS

The subjects were one hundred-fifty-four sophomore, junior, and senior girls who attend the New Trier West High School in Northfield, Illinois. They were required by the school board to take physical education every day. The subjects in this study elected to take badminton as a six-weeks unit during the third six weeks of the 1973-74 fall semester.

At the start of the six-week unit fifty-eight subjects had never had badminton before. Sixty-three had had one unit before, twenty-nine subjects two units before, twelve subjects three units before, four subjects four units before, and eight had been on the girls' inter-scholastic badminton team.

In order to do this study at New Trier the author used typical class sizes for the study to accommodate all of those students who desired to take badminton. Four classes of forty to fifty each were randomly selected from the daily class schedule of nine periods. Each class was tested with the Miller Wall Volley Test using Carlton 00282 outdoor rubber tipped shuttlecocks. From the results of this pre-test, each subject in the class was ranked according to the average score on the three trials. (See Raw Data chart in Appendix L). Each section was then divided into a traditional and a

programmed group, each with its own instructor according to the following plan:

Section 1 Pd. 1 (41)		Section 2 Pd. 2 (40)		Section 3 Pd. 6/7 (44)		Section 4 Pd. 9 (49)	
Tra.	Ex.	Tra.	Ex.	Tra.	Ex.	Tra.	Ex.
1	2	2	1	1	2	2	1
4	3	3	4	4	3	3	4
5	6	6	5	5	6	6	5
8	7	7	8	8	7	7	8
9	10	10	9	9	10	10	9
12	11	11	12	12	11	11	12
13	14	14	13	13	14	14	13
16	15	15	16	16	15	15	16
17	18	18	17	17	18	18	17
20	19	19	20	20	19	19	20
21	22	22	21	21	22	22	21
24	23	23	24	24	23	23	24
25	26	26	25	25	26	26	25
28	27	27	28	28	27	27	28
29	30	30	29	29	30	30	29
32	31	31	32	32	31	31	32
33	34	34	33	33	34	34	33
36	35	35	36	36	35	35	36
37	38	38	37	37	38	38	37
40	39	39	40	40	39	39	40
41				41	42	42	41
				44	43	43	44
						46	45
						47	48
							49

The top player was alternated in each section of the class so that the ranking of abilities was equal for each method of teaching. Thus, half of the class was taught by Teacher 1 utilizing the traditional method while the other half of the class was taught by Teacher 2 using the experimental method. In total there were eight classes.

After the study had gotten underway, those students who had been absent the first two days of class and missed

the pre-test were dropped. Those who had had program changes and/or injuries and had to go into an adaptive class were also dropped. (See Table 1). A total of twenty-two students were dropped from the study, thus making the final groups unequal in number.

Table 1
Schedule of Classes and Subjects

Course No.	Method of Teaching Class	Initial Enrollment	Subjects Dropped	Final Enroll.
018-1	Programmed	22	4	18
	Traditional	21	3	18
018-2	Programmed	20	2	18
	Traditional	20	4	16
018-3	Programmed	23	4	19
	Traditional	21	1	20
018-9	Programmed	25	2	23
	Traditional	24	2	22
TOTAL SUBJECTS		176	22	154
Programmed		78		
Traditional		76		

ASSIGNMENT OF INSTRUCTORS TO CLASSES

The author taught four groups, two programmed and two traditional, and another instructor, Frances E. Camp, with approximately the same background and interest in badminton taught the four other groups, two programmed and two traditional.

Teacher 1	2 Programmed	2 Traditional
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Teacher 2	2 Programmed	2 Traditional
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Each instructor had a gymnasium with three regulation and two half-sized courts inbetween the regulation courts. The two gymnasiums were separated by concrete block walls so that there was complete privacy for each instructor and class. There was ample wall space but it could not be used for practice when games were in progress because of too little space between the end of each court and the wall. For this reason most of the programmed instructional unit involving tasks had to be used on the available court space.

At the conclusion of ten to eleven days of instruction in both the learning of the skills and the rules of the game, the students in the two separate groups in each section engaged in a Circuit Badminton Tournament (format in Appendix E) that had been validated for its practicality for a study of this type in a previous pilot study. Each student sought her own doubles partner. It did not matter whether the partner was from her own half of the class or from the other half since playing data were computed on an individual basis only. The raw score for tournament points was the total number of singles points divided by the number of games played. (See Appendix E).

ASSIGNMENT OF CLASSES TO TREATMENTS

Each of the groups in the four sections was randomly assigned a treatment so that half of the subjects were taught by the two different instructors using the traditional or the programmed methods.

Both the programmed and experimental classes practiced daily upon coming to class by hitting the outdoor shuttles consecutively against the wall for 5 trials. The sequence for this was forehand-overhead clears for the first week, backhand-overhead clears for the second week, and forehand drives for the last day of instruction. This practice was discontinued when the tournament started because of the time it involved.

THE CONSTRUCTION OF THE PROGRAMMED INSTRUCTION OF BADMINTON SKILLS

The author explored the available sources for programmed instruction and also analyzed the skills of badminton from ten available instruction badminton books. (See Appendix A) A card file was made of each skill with its component parts. A linear program was written from these parts developing the total skill. The essential points agreed upon by the different authors were the bases of the program. The author also visited the physical education department at the University of Wisconsin in Madison, Wisconsin, for one

day in October of 1971 and read all of the available cinematographic analyses of specific badminton skills and incorporated them into the program when they were appropriate.

Since there is no specific format for programming a motor skill, construction of a linear tool organized according to tasks, using the principles of programmed instruction and behavior modification was undertaken. The programming of physical skills is a new venture that in this case was controlled by behavioral objectives so that the results could be objectively evaluated. Therefore, the investigator wrote behavioral objectives and criteria frames for all of the badminton skills that had been analyzed previously. The original tool was completed in July of 1971.

Portions of the program were tried with randomly selected students in badminton sections during the 1971-72 school year at New Trier West High School. By studying the students' work through the program and soliciting their constructive criticisms, modifications were made in the adjustment of the frames, criteria test frames, and behavioral objectives. The more advanced skills were tested and modified after work with the 1973 New Trier West Girls' Badminton Team. The author was mainly interested in getting the students to understand the cognitive development of each skill from small step presentation. Confusion over a step in the skill or awkward terminology was adjusted according

to the students' suggestions. The criteria test frame, if it requested a psycho-motor skill, was not expected to be mastered by everyone, because of lack of strength and eye-hand coordination. Most tasks have a criteria test frame of five out of ten for satisfactory achievement. Three trials are allowed in each behavioral objective for achieving this. Jenkins (95) presented his theory of mastery for a motor skill as ten successes out of ten or nine successes out of ten.

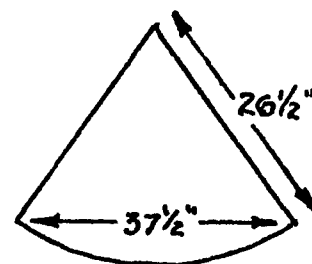
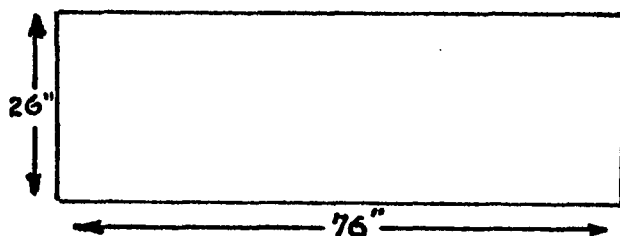
The final tool was completed in September of 1973. (See Appendix B). It was a dittoed, loose-leaf notebook of all of the skills in the game of badminton accompanied by appropriate drawings and diagrams.

The numbers in the Table of Contents represented the number of each program along with the title of each and the type of answer that was required for the criteria test frame. Some programs called for multiple-choice type answers, completion, a picture, or a motor task. Certain motor tasks asked the student to do a skill five times in a row, attempt a task and either be successful or unsuccessful, or be successful five out of ten times. Those programs requiring court space were designated with a "C" after the number of the program in the Table of Contents.

It was the intention of the author to develop a program that was economical and that could be used over and over again. To conserve paper the students were asked to

not write in the books. Each day they started class with a new answer sheet which had been duplicated. (See Appendix C). Because of this method the books could be used by every class during the school day. For the purposes of this study each class had its own answer sheet in a specific color to distinguish class from class.

Many of the criteria test frames asked the student to aim for "the green target area." These were polyethylene targets. There was a rectangular one 76" by 26" and a triangular one with a $26\frac{1}{2}$ " radius and $37\frac{1}{2}$ " across the "cone" edge. The latter target would fit in the "upside down T" areas of the service court. Each badminton court had four targets of each kind.

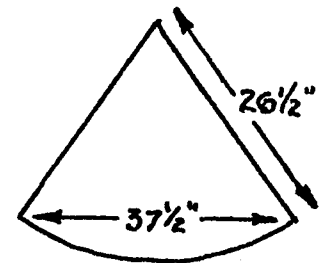
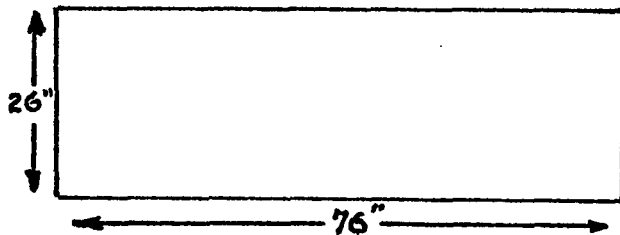


Both the books and the targets were transported on three carts, one for each court, so that the students could get out the equipment, use it, and put it away. These carts were transported by gym scooters.

If the student wanted to attempt the criteria test frame without reading through the programs she was permitted to do so. She was permitted to attempt any skills that she

not write in the books. Each day they started class with a new answer sheet which had been duplicated. (See Appendix C). Because of this method the books could be used by every class during the school day. For the purposes of this study each class had its own answer sheet in a specific color to distinguish class from class.

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Both the books and the targets were transported on three carts, one for each court, so that the students could get out the equipment, use it, and put it away. These carts were transported by gym scooters.

If the student wanted to attempt the criteria test frame without reading through the programs she was permitted to do so. She was permitted to attempt any skills that she

wished and repeated them as many times as she wished. An overt answer was required only for the criteria test frame. When questions were asked elsewhere in the linear program the student did them mentally and then looked at the correct answer for immediate reinforcement. A copy of the answer sheet is in Appendix C.

THE SELECTION AND ADMINISTRATION OF MEASUREMENT TOOLS

The Miller Wall Volley Test

The Miller Wall Volley Test (64) taken with Carlton 00282 outdoor rubber-tipped shuttlecocks was used to measure general badminton-playing ability in a pre- and post-test situation. Miller determined the reliability of this test by the test-retest method with college students to be $.94 \pm .008$. She established the validity of the test in relation to total playing ability by correlating scores for twenty players with the results of a round-robin tournament among the same twenty players. This was found to be $.83 \pm .047$.

Since no written evidence about this test was found with regard to its suitability for high school students, the investigator conducted a pilot study in 1971-72 and found the test to be suitable for high school students.

When the Miller Wall Volley Test was administered, (See Appendix D) the students were arranged into sixteen testing stations in the two gymnasiums according to an alphabetical order with student counters and recorders. All of the stations and trials were run at the same time by the author who used one stop watch and a whistle. The test was administered again at the end of the unit. When the totals for each subject were secured the scores were used to determine if there was any significant difference in skill level between the control and experimental groups.

The Circuit Ladder Tournament

At the conclusion of the skill learning unit (approximately ten to eleven lessons) individuals within both groups participated in the Circuit Ladder Tournament in a doubles combination with any partner they selected.

The Circuit Ladder Tournament that was used here allowed for both singles and doubles play but did not offer the opportunity for a regulation game to be played. (Format in Appendix E). For the purposes of this study there could not be any tied games for each day's play. The players had to keep playing until one person won by one point.

In a pilot study conducted with classes at New Trier West during 1971-72, the rankings of this Circuit Ladder Tournament were validated using the Rho Technique of Correlation with the post-testing of the Miller Wall Volley Test. Validities of .49, .62, .68, .72, and .44 were obtained from

five different badminton classes after twelve days of play. This Circuit Ladder Tournament was experimented with and adapted for use in a forty-minute period with classes of thirty-eight to fifty people on six courts. Depending upon the number of participants in the class each had its own method of travelling up and down the circuit. (See Appendixes F, G, H, I)

The idea for the tournament came from the article entitled "A Skill Grading System Using a Modified Ladder Tournament." (33) The basic principle of the Swegan (79) modified tournament as described by Biscoff (33) is that the winning team moves up one court for the next game and the losing team moves down one court.

When the tournament began the players were allowed to choose their own partners from either half of the class, but each individual was coded as to whether she learned the skills through the traditional or experimental method. The author felt that social compatibility was an important factor in high school physical education classes. Each member of the team played a member of the opposing team in a doubles game. The length of the game was determined by the time available and not by a regulation number of points. The usual sequence was five to six minutes for a singles game and ten minutes for the doubles. Each game represented one point, and the team winning two out of the three points advanced a court the next day while the losers moved down

one court. Since the ten courts were numbered consecutively, the winners moved toward the lowered numbered courts while the losers moved toward the higher numbered courts. (See Appendix J)

An individual's class rank was determined by adding up the total number of game points for that individual's singles games and dividing that total by the number of games played. This class rank for tournament play was then correlated with the average score of the three trials on the Miller Wall Volley post-test. The correlation coefficients were .61, .61, .62, and .51.

The doubles match was used only to determine court level; it was not a direct factor in the individual point computation and was simply a "time-cushion." Based on this, the top player in the class did not always end up on court number one at the end of the tournament because she chose to play doubles with a weaker member of the class.

The circuit tournament demanded efficiency of play and was based on a "sudden death" concept when the time was up. This type of tournament helped and forced most people in the class to develop skills and competitive attitude with regard to people of similar playing ability. Each class and instructor could expand on the number of minutes provided per game (all games were run by one Lux Minute Minder, a bell-shaped timer, or a regulation game was played if time allowed for this.)

The Circuit Ladder Tournament was developed in order to allow excess players to play on the space between the regulation courts in a competitive singles situation. These smaller width courts between the regulation courts are termed "feeder courts" and "fed" into the next regulation court the next day. In order to keep the doubles play rotating with an excess number of players for the available number of regulation courts, the feeder courts were merely "waiting stations" but a good, half-court singles game could be played on them.

Construction and size of feeder courts. The courts were approximately eight feet wide. The common sidelines of the regulation courts were used as the sidelines of each feeder court. The length of each court was regulation.

A short service line was put down with blue Mystic Tape. There was no center line separating the two service courts because of the narrowness of the total area.

A net that would ordinarily have been discarded was cut into four $\frac{1}{4}$ lengths and restrung with nylon rope so that each would fit inbetween the regulation courts.

CLASS PROCEDURE AND IMPLEMENTATION OF THE TWO INSTRUCTIONAL PROGRAMS

Classes at New Trier West were forty minutes long, which allowed seven minutes to get dressed and to class and seven minutes at the end to get dressed for the next class.

This left approximately twenty-six minutes for explanation and activity. Units were six weeks long and classes met every day, five days a week, with various interruptions for vacations, institutes, and assemblies. This particular unit was interrupted by a two-week Christmas vacation period and a three-day final examination period.

In the traditional class the teacher was allowed to instruct at her own pace according to her own preference and included as many skills as she chose along with instruction in both singles and doubles play as well as rules. Both Instructors 1 and 2 agreed on a format for each day's lesson with appropriate behavioral objectives. (See Appendix K).

The experimental group used the programmed instructional booklet. The teacher interacted with the students and gave demonstrations when a visual aid was requested and gave instruction in both singles and doubles play as well as rules.

Both the programmed and experimental classes practiced hitting the rubber-tipped shuttles against the wall for the eleven lessons. Consecutive hits were recorded for five trials. The first week was forehand overhead clears, the second week backhand clears, and the last day forehand drives.

TREATMENT OF DATA

Data collected for the study were the three trials of the pre- and post- Miller Wall Volley Test and the final class ranking of the Circuit Ladder Tournament. Other raw data included the number of previous units of experience and the number of class absences. (See Appendix L).

The statistical analysis was done by MANOVA, a multivariate analysis of variance which gave simultaneous consideration of method and teacher plus consideration of the Miller post-test, and the Circuit Ladder Tournament.

Two MANOVA F ratios were computed for the effect of method, teacher, and teacher-method interaction. A univariate F for each of the dependent variables was also computed to provide an overall statement as to whether the groups differed significantly.

The means and standard deviations for teacher-method interaction for each of the three dependent variables were computed.

CHAPTER IV

ANALYSIS OF DATA

The results of this study were analyzed to determine the effectiveness of the programmed method of teaching badminton skills as compared to the traditional method. A Miller Wall Volley pre-test was administered to each of four classes. The subjects were systematically assigned to a treatment and instructed by use of one of the two methods of teaching. After the teaching treatment had been applied, each class competed in a Circuit Ladder Tournament and then took the Miller Wall Volley post-test.

The statistical treatment utilized a multivariate analysis of variance (MANOVA). This statistical approach gives simultaneous consideration to two or more dependent variables and two or more independent variables. MANOVA determines group differences by considering the dependent variables simultaneously and then takes into consideration the relationship among the dependent variables. Newell and Martens (20) stated that the fundamental difference between MANOVA and ANOVA is that the former compares the hypothesis variance to error variance (F-ratio) by joining a number of dependent measures into one measure. This means that the multiple dependent variables are converted into a single

composite variable by means of a linear transformation of the dependent variables.

Two MANOVA F ratios were computed for the effect of method, teacher, and teacher-method interaction. The univariate F for each of the dependent variables, post-test and tournament, were treated simultaneously and provided an overall statement as to whether the groups differed significantly. The MANOVA also provided for a discriminant function analysis which is a method for determining the contribution that each dependent variable makes to the differences between groups. The uniqueness of this test is that it reveals information as to which dependent variables provided the maximum contribution in discriminating between groups.

Table 2 shows each teacher with her total subjects (two classes) for each method. A visual inspection shows that the subjects in the four sections were nearly equal in ability as shown by the means and standard deviations for the pre-test, post-test, and tournament variables. The average of the three trials of the Miller Wall Volley pre-test was 12.3; the average of the three trials of the Miller Wall Volley post-test was 15.1; and the average points computed by the total points accumulated and divided by the number of games played was 5.5 for the Circuit Ladder Tournament.

Observation of Table 3 shows that the Programmed and Traditional halves of each class were very close in being matched on the Miller Wall Volley pre-test. The mortality

Table 2

Means and Standard Deviations for the Two
 Dependent Variables: Post-Test
 and Tournament, in Relation
 to Teacher and Method

Factor		Number of Subjects		Variables 1 Post	2 Tourn.
Teacher	Method				
2	Pro	37	M	15.795	5.905
			SD	3.623	2.524
1	Tra	38	M	15.308	5.197
			SD	4.190	1.766
1	Pro	41	M	14.676	5.310
			SD	4.505	1.617
2	Tra	38	M	14.424	5.479
			SD	3.966	2.052

Table 3
 Miller Wall Volley Pre-Test: Mean Skill Test
 Scores and Standard Deviations of the
 Eight Badminton Classes

Class	1	2	3	9
Teacher	2	1	2	1
PROGRAMMED METHOD				
Mean	11.6	12.8	13.2	12.2
SD	3.766	5.029	4.055	5.104
Number	18	18	19	23
Total: 78				
Grand Mean	12.45			
TRADITIONAL METHOD				
Mean	11.5	13.5	11.9	12.4
SD	3.88	4.588	4.549	5.047
Number	18	16	20	22
Total: 76				
Grand Mean	12.325			

rate of twenty-two subjects, twelve programmed and ten traditional, may have accounted for the slight differences in means in each section. The grand mean for the programmed method was 12.45 and the grand mean for the traditional method was 12.325.

Table 4 shows that there was improvement by both groups in the mean scores for the Miller Wall Volley post-test. The two teaching methods used with the subjects were equally effective with the programmed subjects being slightly higher. The grand mean for the programmed subjects was 15.2 while that of the traditional subjects was 14.75.

On the Circuit Ladder Tournament, the eight classes were close in average points with Class 3--Programmed, being the highest with 6.5 points out of a possible 11. The grand mean for the programmed subjects was 5.6 while that of the traditional subjects was 5.4 as shown in Table 5.

Tests of significance using Wilks' Lambda Criterion and Canonical Correlations showed the calculated MANOVA F ratio for the method effect to be .334. An F value of 3.00 for two and one hundred forty-nine degrees of freedom was required for a significance at the .05 level of confidence. There was no statistically significant difference in the effectiveness of the two methods of teaching. Table 6 shows the dependent variable breakdown. The univariate F tests for one and one hundred-fifty degrees of freedom showed .271 for the post-test and .672 for the tournament.

Table 4

Miller Wall Volley Post-Test: Mean Skill Test
Scores and Standard Deviations of the
Eight Badminton Classes

Class	1	2	3	9
Teacher	2	1	2	1
PROGRAMMED METHOD				
Mean	15.4	14.4	16.1	14.9
SD	3.478	5.200	3.630	3.744
Number	18	18	19	23
Total: 78				
Grand Mean	15.2			
TRADITIONAL METHOD				
Mean	13.8	13.2	16.7	15.3
SD	3.14	3.647	4.42	3.866
Number	18	16	20	22
Total: 76				
Grand Mean	14.75			

Table 5

Modified Circuit Ladder Tournament: Mean Game
Scores and Standard Deviations of the
Eight Badminton Classes

Class	1	2	3	9
Teacher	2	1	2	1
PROGRAMMED METHOD				
Mean	5.3	5.2	6.5	5.4
SD	2.23	1.81	2.56	1.40
Number	18	18	19	23
Total: 78				
Grand Mean	5.6			
TRADITIONAL METHOD				
Mean	5.1	5.3	5.6	5.6
SD	1.39	2.06	1.68	1.99
Number	18	16	20	22
Total: 76				
Grand Mean	5.4			

Table 6

MANOVA: Multivariate and Univariate F
Tests for the Effect of Method on
the Post-Miller, and Circuit
Ladder Tournament

<u>Summary of Multivariate MANOVA</u>					
Source	DFHYP	DFERR	F	Prob. Less Than	R
Method	2	149	.334	.717	.067
<u>Summary of Univariate F's</u>					
VARIABLE	Mean Square	F (1, 150)	Prob. Less Than		
Post-Miller	4.551	.271	.603		
Circuit Ladder Tournament	2.711	.672	.414		

The programmed classes used a total of forty out of one hundred and two written programs. Those attempted by the four classes are starred with an asterisk in Appendix B. The complete program also appears in Appendix B.

In the programmed classes the students came to class early, decided what program or programs they wanted to attempt, read the programs, and then attempted to master the criteria test frame. As the classes filled to their capacity, lack of space and time prohibited students from repeating the criteria test frames for mastery. Some of the more experienced students suggested that the frames were too long and in certain cases thought that reading the behavioral

objective and then attempting the criteria test frame was sufficient. Very often the instructors were asked to demonstrate the skill for a visual account of the whole skill.

Both instructors felt that the students were receptive to the programmed method but some students indicated that they would rather be physically active all of the time instead of reading. Even those in the traditional classes wanted to play games or hit the bird all of the time instead of practicing specific skills. If there was any difference in the voluntarily elected practice time it did not seem to affect the results of the study since time was allowed for playing during each period. The mastery of a skill was more apparent in the programmed unit than the traditional because of the identification of specific behavioral objectives and criteria frames. The programmed book was also good for remedial work, helping people learn (on their own time) when they had been absent, and occupying the time of those who were not able to participate actively in a normal class situation. A student never ran out of things to do in the programmed method and as a result more initiative had to be used; the students appeared to be busy all of the time.

Both instructors found that the less skilled and less experienced students sought guidance in selecting what programs to do in order to have some sort of unified approach to the game. They expressed the feeling that the programmed skills were isolated learning experiences and they had

trouble making decisions as to which program to choose without teacher guidance. The sequential format of the total program seemed to disinterest the students who were beyond the beginning level and they preferred to choose specific programs which they believed would help their game. A few subjects had trouble getting partners who could consistently set up the shuttle and would ask the instructor to do it for them. A few did not want to attempt a criteria test frame until they felt they really knew how to do it.

Knowledge of results seemed important to the students, and immediate feedback is one of the characteristics of programmed instruction. The more skilled students attempted more programs and had more time to play while the less skilled concentrated on a few programs in order to achieve sufficient skill to play and enjoy the game.

The findings in this study for the effect of method in programmed and traditional teaching are the same as the other authors who dealt with the programming of a motor skill. Holt (94) found no statistically significant difference in the effectiveness of the two instructional methods in her golf study. She said that approximately the same amount of time was spent on skill learning in both instructional methods and felt that the acquisition of skill was the single most important objective of an elementary golf class.

Farrell (90) found both methods to be equally effective when comparing intact units with tennis and Fuertiges (92) arrived at the same conclusion. Both authors expressed the need for showing a good film loop or having a live demonstration of the game to give the students a better idea of what they were trying to learn.

Adler (86) did find a significant interaction between his two groups in the 5-iron shot test with the programmed group improving significantly. But the extremely low F-ratio of .05 found for the rows (experimental and control groups) indicated very little difference between the programmed and non-programmed students at any of the three testing points which was a F-ratio of .75 for columns. Adler concluded that the method used in learning the iron swing had little effect on acquiring the skills of the short game.

Tests of significance using Wilks' Lambda Criterion and Canonical Correlations showed the calculated MANOVA F ratio for the teacher effect to be 1.219 which was not significant at the .05 level of confidence. An F ratio of 3.00 for two and one hundred forty-nine degrees of freedom, was required. The relationship of the two dependent variables is shown in Table 7. The univariate F tests for one and one hundred-fifty degrees of freedom showed .033 for the post-test, and 1.793 for the tournament.

Table 7

MANOVA: Multivariate and Univariate F Tests for
the Effect of Teacher on the Post-Miller and
Circuit Badminton Tournament

Summary of Multivariate MANOVA					
Source	DFHYP	DFERR	F	Prob. Less Than	R
Teacher	2	149	1.219	.299	.127
Summary of Univariate F's					
VARIABLE	Mean Square	F (1, 150)	Prob. Less Than		
Post-Miller	.556	.033	.856		
Circuit Ladder Tournament	7.235	1.793	.183		

The above results suggest that in the eleven days allowed for instruction in this unit there was no significant difference between the two teachers. Both had similar backgrounds in the teaching of badminton and both play in ABA tournaments.

Other studies that discussed the effect of teacher found comparable results. Holt (94) found no statistically significant variability that could be attributed to teacher differences. She concluded that the three teachers used in her study were probably above average in teaching ability as determined by years of teaching experience and educational level. Holt suggested that a good programmed unit might result in a greater degree of learning than the traditional

method when taught by an ineffective teacher or one with a weak skills background.

It would have been interesting and possibly revealing to take Fuertiges' (92) suggestion that the instructor keep a daily record of the progress of each student and use this to spot those having difficulty and compare these findings to a subjective estimate of how each student was doing. Farrell (90) did keep track of what page each student had completed each day but made no mention of teacher-student interaction. She said that students did comment about the impersonality of the programmed method of teaching tennis.

Farrell (90) recommended that the teacher using the program as an instructional tool, as well as being thoroughly familiar with its contents, must still have different ways of practicing the skills for those having difficulty, especially those of low skill capacity. She also said that the teacher should interact with the student when necessary. Fuertiges (92) arrived at the same conclusions.

Adler (86) did have his instructors interact with the subjects of both groups. When the subjects were not getting formal instruction they would go to the practice tee. At this practice area the instructor would move up and down the range giving individual help whenever it was needed or requested. He said that this help was based on information from the lectures for the control group and on the information from the program for the experimental group. Adler

also concluded that his groups were equal in ability to learn a motor skill and that the difference in performance scores was due to the experimental variable.

The calculated MANOVA F ratio using Wilks' Lambda Criterion and Canonical Correlations for teacher-method with the two dependent variables of post-test and tournament was not significant at the .05 level of confidence for two and one hundred forty-nine degrees of freedom as shown in Table 8.

Table 8

MANOVA: Multivariate and Univariate F Tests for
the Effect of Teacher-Method on the Post-
Miller and Circuit Badminton Tournament

<u>Summary of Multivariate MANOVA</u>					
Source	DFHYP	DFERR	F	Prob. Less Than	R
Teacher-Method	2	149	1.302	.275	.131
<u>Summary of Univariate F's</u>					
VARIABLE	Mean Square	F (1,150)	Prob. Less Than		
Post-Miller	38.565	2.299	.132		
Circuit Ladder Tournament	0.948	.235	.629		

In order to gain more understanding of the three dependent variables a SPSS Version 5.01 was used to find the Pearson Product Moment Correlations between the three variables of pre, post and tournament as shown in Table 9. Those with an asterisk were significant at the .05 level.

The coefficient for the traditional groups between the pre-Miller and post-Miller Wall Volley Test was .5099 in comparison to .7548 for the programmed group. But when compared with Teacher 1 to Teacher 2 the coefficients are similar; .6397 for Teacher 1 and .6282 for Teacher 2.

The coefficients for the pre-Miller and tournament and the post-Miller and tournament were all higher for the programmed halves; .6229 compared to .5224 and .6593 compared to .5596 respectively.

The correlation coefficients for the total distribution of one hundred fifty-four subjects were all significant at the .05 level of confidence. The pre-Miller and post-Miller was .6338, the pre-Miller and tournament .5744, and the post-Miller and tournament .6132.

From the above correlation coefficients it can be assumed that either the post-Miller or the Circuit Ladder Tournament is a valid method for determining playing ability.

Table 9 shows the low correlation coefficients of Class 3--Traditional Method. The raw data shows a very high absentee rate in that half of the class that could have

Table 9

Pearson Product Moment Correlations of the Three Variables:
Miller Wall Volley Pre-Test, Miller Wall Volley Post-Test,
and Circuit Ladder Tournament

	TRADITIONAL METHOD				PROGRAMMED METHOD			
	Class 1 N = 18	Class 2 N = 16	Class 3 N = 20	Class 9 N = 22	Class 1 N = 18	Class 2 N = 18	Class 3 N = 19	Class 9 N = 23
VARIABLES								
Pre-Test, Post-Test Miller Wall Volley	.8295*	.5483*	.2515	.7568*	.7444*	.8382*	.6474*	.8031*
Pre-Test, Circuit Ladder Tournament	.6947*	.6871*	.0819	.6981*	.7549*	.7566*	.7648*	.3728*
Post-Test, Circuit Ladder Tournament	.6298*	.6778*	.3229	.7670*	.7591*	.7040*	.7084*	.5601*

(Table 9 continued)

Table 9 (continued)

Pearson Product Moment Correlations of the Three Variables:
Miller Wall Volley Pre-Test, Miller Wall Volley Post-Test,
and Circuit Ladder Tournament

	TOTAL TRADITIONAL METHOD N = 76	TOTAL TEACHER 1 N = 79	TOTAL PROGRAMMED METHOD N = 78	TOTAL TEACHER 2 N = 75
Pre-Test, Post-Test Miller Wall Volley	.5099*	.6397*	.7548*	.6382*
Pre-Test, Circuit Ladder Tournament	.5224*	.4335*	.6229*	.7002*
Post-Test, Circuit Ladder Tournament	.5596*	.5301*	.6593*	.7167*
	THE TOTAL DISTRIBUTION N = 154			
Pre-Test, Post-Test Miller Wall Volley			.6338*	
Pre-Test, Circuit Ladder Tournament			.5744*	
Post-Test, Circuit Ladder Tournament			.6132*	

* Indicates significance at .05 level of confidence

affected their practice time and the final outcomes could have affected the post-Miller and tournament scores. Period 9--Traditional also had a very low correlation coefficient but it was still significant. An empirical observation by the two instructors showed that the majority of the people in the traditional half of the class were known to be discipline problems and were usually not motivated to learn or improve themselves. In other words they did not seem to care about playing badminton. (See Raw Data Chart in Appendix L.) Therefore high absenteeism and a lack of motivation could have been the uncontrolled variables here.

In comparing these findings with those of Holt (94), we find similarities. Through an analysis of variance she found no statistical difference in teacher-method interaction and concluded that the method effect was independent of teachers; that is, there was approximately the same difference between the two methods regardless of teacher influence. She concluded that a subjective evaluation of student ability would have revealed very little difference in the amount of learning that had occurred between the two groups. She felt that the effectiveness of one method was quite comparable to the effectiveness of the other method. The instructors in her study found it difficult to provide ample instruction for students in the traditional classes but did not have this problem with the programmed classes. In the present study, the students who

were less skilled or less experienced often sought the advice of the instructor in selecting programs because they failed to see how each skill fit into the total game. The more skilled students had no trouble picking their programs and appreciated being able to skip the skills that they were already familiar with or felt they did not need to work on. Most of the investigators who developed programs with a motor skill felt that a film or a live demonstration would be beneficial in understanding the object of the game with its component parts.

Holt also found that the rate of progress of students who were absent from as many as two traditional classes often appeared to decline, whereas absenteeism in the programmed classes was less detrimental to progress. Her final conclusion was that methods and teachers operate independently of each other. The instructors of this study felt that the programmed book was good for remedial work, helping people learn when they had been absent, and occupying the time for those who could only have inactive participation during class time. Knowledge of results was there for each student no matter what program or programs they attempted, which freed the instructor for more individualized help.

In summarizing the effects of the traditional versus the programmed learning method for the learning of badminton skills, both methods were found to be equally effective.

The means and standard deviations for the two methods and the two teachers were similar when compared for the two dependent variables of the Miller Wall Volley post-test and the Circuit Ladder Tournament. The systematic leveling (putting the worst and the best players in each group) could have emphasized differences due to treatments of method or teacher by minimizing the variance. There is also the possibility that the systematized leveling of the sample used was not reflected in the MANOVA technique and might have been highlighted better by the use of a statistic which acknowledges grouping of matched pairs. The results of no significance show the methods used to learn different badminton skills had little effect on the post-test or the Circuit Ladder Tournament.

In this study there was no statistical difference in the instructional methods as was true in most of the other studies dealing with a motor skill. The same was true of the effect of teacher and most investigators concluded that the method effect was independent of teachers.

CHAPTER V

SUMMARY, FINDINGS, OBSERVATIONS, CONCLUSIONS,
AND RECOMMENDATIONS FOR FURTHER STUDY

SUMMARY

General Problem

It was the purpose of this study to develop and validate a programmed instructional tool to teach badminton skills to adolescents of heterogeneous backgrounds. A second purpose was to compare the effectiveness of the tool with the traditional method of teaching. It then became necessary to develop a Circuit Ladder Tournament that was valid and reliable in testing general playing ability. The effectiveness of the two methods was measured by the Miller Wall Volley post-test and by the subject's final ranking in the Circuit Badminton Tournament.

Hypothesis

The study was designed to test the null hypothesis that subjects taught by the traditional method and subjects taught by the programmed method would not differ in badminton playing ability as measured by the Miller Wall Volley post-test and the final ranking in the Circuit Badminton Tournament.

Procedure

The subjects were one hundred fifty-four sophomore, junior, and senior girls who attended the New Trier West High School in Northfield, Illinois. There were a total of seventy-six students in the four traditional classes and seventy-eight students in the programmed classes. The author and another instructor each taught two programmed classes and two traditional classes. Four classes of thirty-eight to fifty students each were randomly selected from already existing intact classes. Each class was tested with the Miller Wall Volley pre-test and from the results of this pre-test, systematically divided into two groups. Half of the class was taught by Teacher 1 using the traditional method while the other half of the class was taught by Teacher 2 using the experimental method. Eleven days were spent instructing the students in both the learning of the skills and the rules of the game. For the next ten days the students played in a Circuit Badminton Tournament and then took the Miller Wall Volley post-test.

The post-test and tournament scores were analyzed by a MANOVA, a multivariate analysis of variance which gives simultaneous consideration of two or more dependent variables and two or more independent variables to compare the effectiveness of the two instructional methods. Two MANOVA F ratios were computed for the effect of method, teacher, and teacher-method interaction with consideration of the two dependent variables.

FINDINGS

1. The calculated MANOVA F ratio for the method effect was not significant at the .05 level of confidence.
2. The calculated MANOVA F ratio for the teacher effect was not significant at the .05 level of confidence.
3. The calculated MANOVA F ratio for teacher-method was not significant at the .05 level of confidence.
4. Immediate reinforcement by the programmed method was valuable to both the student and the teacher in helping to acquire skills for the various strokes because they knew if they had passed the required criteria test frame.
5. The programmed method saved valuable class time and encouraged the students to work independently or with their peers because they could start working immediately upon their arrival to class.
6. Through empirical observation and student comment both teacher and students felt that programmed instruction was an effective approach for developing responsibility, self-initiative, and self-evaluation in skill learning.
7. Both instructors concluded that teacher interaction is most important in using programmed tools. Since there are students who will not be able to perform the task even though they have cognitive understanding, a teacher should not be afraid to deviate from the program.

OBSERVATIONS

1. Separate programs for left-handed players would have been more accommodating to these students.
2. The fifteen-day lapse of time for Christmas vacation before the start of the tournament may have affected the play of the students and allowed them to lose the continuity of the benefits of the instruction prior to the vacation period. There was also a three-day exam period after playing one week of the tournament which broke the continuity and momentum of tournament play.
3. The results of the study may have been more significant if the Miller post-test had been given immediately after the treatments.
4. Both teachers and students felt that experienced students who thought they could master a skill without having to go through each frame should be able to skip the frames and attempt to pass the criteria test frames and then go back if necessary.
5. Both students and teachers said that it was best to repeat the most valuable criteria test frames until mastery was achieved rather than going on to new skills.
6. In the programmed method of teaching the instructor was free to give the students more individualized help.

7. Both teachers agreed that each class in the programmed instruction should have a master chart to see what students had attempted what programs with the results of those criteria test frames so they could see trouble spots with each student.

8. Regulation games should be played for the tournament but it was not feasible for this high school's time schedule.

9. Adequate space, and a sufficient length of time lends itself to better results in programmed instruction or any kind of instruction for that matter. Empirically both instructors were disappointed with the caliber of badminton displayed by either method.

10. It is worthwhile and necessary to spend time on how to use the program and answer sheet and do one program all together.

11. During the first day of the unit a demonstration game should be shown to the students or a film showing actual "good badminton play" so that the students will have a total picture of what they are trying to learn.

12. Both instructors agreed that some sort of order should be established for beginning students to progress through the programmed text.

13. Some of the longer programs should be cut down in length with more illustrations.

CONCLUSIONS

1. The programmed method of teaching was as effective as the traditional method of teaching.
2. The Miller Wall Volley Test proved to be an effective tool in equating the two halves of each class and was non-time consuming and easy to administer.
3. The Circuit Badminton Tournament was an effective tool in measuring playing ability for the time and space limitations of this study.

RECOMMENDATIONS FOR FUTURE RESEARCH

1. Replicate this study with adults and physical education majors who plan to go into teaching or coaching.
2. Replicate this exact study with adolescents in an uninterrupted six weeks period with random blocked assignment of students to the two methods of teaching.
3. Replicate this study with students who have had absolutely no experience in badminton.
4. Replicate this study with an inexperienced or ineffective teacher on the programmed half or with no teacher at all.
5. Use this program as a linear script for film strips on the various badminton skills.

6. Investigate the effect of reading and comprehension levels with the use of programmed instruction.

7. Develop more programmed tools in all activities using the task method of learning.

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APPENDIX A

LIST OF BADMINTON BOOKS USED AS THE BASIS
FOR THE MALIZOLA LINEAR PROGRAM

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1. Brown, Edward. The Complete Book of Badminton. Harrisburg, Pa.: Stackpole Books, 1969.
2. Davidson, Kenneth R. and Lealand R. Gustavson. Winning Badminton. New York: The Ronald Press Co., 1964.
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APPENDIX B
A PROGRAMMED APPROACH TO LEARNING BADMINTON

DIRECTIONS FOR A PROGRAMMED APPROACH
TO LEARNING BADMINTON

1. Each day you will get a new answer sheet. You are to write everything on the answer sheet and not in the book.

2. Each lesson is developed through the use of frames. Each frame gives you some information and is supposed to self-instruct you. If the programmed skill is new to you, read through each frame. If the frame asks you a question, answer it mentally and then look to the left of the frame to see if you are correct. The only time that you are required to give written responses is to the Criteria Test Frame which is usually the last frame on the program.

3. Most of the Criteria Test Frames that involve a task ask that you pass the skill with a minimum of 5 out of 10. Do attempt all 10 trials and see if you can master the skill and pass it with 9 out of 10 or 10 out of 10. If you do not pass it with 5 out of 10, repeat the criteria test frame but no more than 3 times. You can always come back to it another day.

4. If you have mastered certain criteria test frames and still want to be challenged by them, alternate courts each time instead of hitting all shuttles from the same side.

5. Don't be afraid to ask for help if you need it.

APPENDIX B

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- *2. The Original Name of Badminton (Multiple Choice)
- *3. The Birthplace of Badminton (Multiple Choice)

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- *4. How to Win (Completion)
- *5. The Importance of Serving (Completion)

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- *6. The Badminton Court (Picture)
- *7. The Singles Court (Picture)
- *8. The Doubles Court (Picture)
- *9. The Center Line (Picture)
- *10. The Service Courts for Both Singles and Doubles (Picture)
- 11. The Short Service Lines (Picture)

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- *13. Wrist Snap (5 times in a row)
- 14. Eye-Hand Coordination (5 times in a row)

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- 16. Wrist Snap (5 times in a row)
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- 18. Switching Grips (Successful or Unsuccessful)
- *19. Shuttle and Racket Contact (Completion)
- *20. Body Position and Weight Transfer (Completion)

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- *21. The Body Stance (Completion)
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- *23. Ready or Home Position (Picture)
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- *35C. Starting a Rally (5 out of 10) (R and L Courts)

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- *36. Theory of the Short Doubles Serve (Completion)
- *37C. Mechanics of the Short Doubles Serve (5 out of 10)
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- *40C. Execution of the Push Shot (5 out of 10) (R and L
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- *43C. Return of Long, High Singles Serve (5 out of 10)
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- 44C. The Long Doubles Serve (5 out of 10--R and L)
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- 47C. Return of Flick Serve (5 out of 10--R and L)
- 48C. Return of High Doubles, Flicks, and Drive Services
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51. Flight Patterns of the Offensive and Defensive
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- 55C. Setting the Shuttle Up to Yourself (5 out of 10--
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- *56C. Hitting a Good Defensive Clear (5 out of 10--forehand
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- *61. Forehand and Backhand (5 out of 10--forehand and
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- 62C. The Underhand Flick Clear (5 out of 10--forehand and
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- 65C. Mechanics of Underhand Attacking Clear (5 out of 10)

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66. Flight Patterns of Loop and Fast Drop Shots (Picture)
- 67C. Execution of Loop Drop Shots (5 out of 10--forehand
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- 68C. Execution of Fast Drop Shot (5 out of 10--forehand
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- 69C. Combination Use of Loop and Fast Drop Shots (5 out of
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- *70. Its Importance (Completion)
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- *73C. Principles of Net Play (5 times in a row)
- *74. Illustrations (Pictures)
- 75. The Purpose of Drop Shots (Completion)
- *76C. Cross-Court Net Shots (5 out of 10)

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- *77C. Hairpin Drop Shots (5 out of 10--forehand and backhand)
- 78C. Return of Smash with an Underhand Drop Shot (5 out of 10)
- 78A. Clear, Smash, Drop (Successful or Unsuccessful)
- 79. A Game (Whom did you play? What was the score?)
- 80C. Backhand Drop Shots--Alternate Overhead and Underhand
(5 out of 10)

DRIVESFOREHAND

- 81. Flight Pattern (Picture)
- 82. Its Greatest Value (Completion)
- 83. Cross-Court and Down-the-Line (Completion)
- 84. Wrist Strength--Forehand (5 times in a row)
- 85C. The Mechanics (5 out of 10--hard and gentle)
- 86. Eye-Hand Coordination (5 times in a row)
- 87C. Accuracy (5 out of 10)
- 88C. Accuracy (5 out of 10)

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- 89. Elbow Principles (Completion)

DRIVESBACKHAND

- 90. Wrist Strength (5 times in a row)
- 91C. The Mechanics (5 out of 10--hard and gentle)
- 92. Eye-Hand Coordination (5 times in a row)
- 93. Accuracy (5 out of 10 times)

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- 94. Advantages and Disadvantages (Completion)
- 95. Mechanics (10 times in a row)
- 96C. Clears: Down-the-Line and Cross Courts (5 out of 10--
cross-court and straight ahead)
- 97C. Drop Shot Execution (5 out of 10--cross-court and
straight ahead)
- 98C. Smashes (5 out of 10)

NET PLAY

- *73C. Principles of Net Play (5 times in a row)
- *74. Illustrations (Pictures)
- 75. The Purpose of Drop Shots (Completion)
- *76C. Cross-Court Net Shots (5 out of 10)

UNDERHAND DROP SHOT

- *77C. Hairpin Drop Shots (5 out of 10--forehand and backhand)
- 78C. Return of Smash with an Underhand Drop Shot (5 out of 10)
- 78A. Clear, Smash, Drop (Successful or Unsuccessful)
- 79. A Game (Whom did you play? What was the score?)
- 80C. Backhand Drop Shots--Alternate Overhead and Underhand
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- 93. Accuracy (5 out of 10 times)

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- 96C. Clears: Down-the-Line and Cross Courts (5 out of 10--
cross-court and straight ahead)
- 97C. Drop Shot Execution (5 out of 10--cross-court and
straight ahead)
- 98C. Smashes (5 out of 10)

- 99C. Combination Clears, Drop Shots, and Half-Smashes
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- 100. Return of Drive Singles Serve (5 out of 10)

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- 101C. Doubles Services (Successful or Unsuccessful)
- *102C. Overhead Drop Shots, Smashes, and Clears (5 out of
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of 10)

PROGRAM 1

HISTORY
DERIVATION OF THE NAME, BADMINTON

Objective

The student must be able to identify the derivation of badminton in a multiple choice type question.

1. In 1873 British officials brought the game of poona to the Duke of Beaufort's Gloucestershire county home which was called BADMINTON. It is from this estate that the game derived its present name.
-

CRITERIA TEST FRAME 1

(Multiple Choice)

Record on answer sheet.
From which of the following did the game of badminton get its name?

- (a) an English Duke's estate
 - (b) a city in India
 - (c) an association of army officers
 - (d) the original racket called a mitton.
- (a) an English Duke's estate

PROGRAM 2
HISTORY
THE ORIGINAL NAME OF BADMINTON

Objective

The student must be able to recognize the original name of badminton in a multiple choice question.

1. Our present game of badminton was originally called POONA and was first played in Poona, India.
-

CRITERIA TEST FRAME 2

(Multiple Choice)

Record on answer sheet.
Which of the following is correct?

Badminton was first known by what name?

- (a) Poona
- (b) Mitton
- (c) Shuttlebird
- (d) Birdie

(a) Poona

PROGRAM 3
HISTORY
THE BIRTHPLACE OF BADMINTON

Objective

The student must be able to identify the birthplace of badminton in a multiple choice question.

1. The game of badminton originated in Poona, India, and was played with wooden paddles used to hit a ball.
-

CRITERIA TEST FRAME 3

(Multiple Choice)

Record on answer sheet.
Which of the following is correct?

The game of badminton originated in which country?

- (a) India
- (b) England
- (c) France
- (d) China

(a) India

PROGRAM 4

OBJECT OF THE GAME
HOW TO WIN

Objective

The student must be able to understand the object of the game prior to the learning of the individual skills by giving the correct answers to the criteria frame.

1. Your objective in playing the game of badminton is to WIN by hitting the shuttle to the floor within the boundaries of your opponent's court or by forcing him to ERROR by making him hit into the net or out of the court on your side of the net.

2. The strategy that you want to keep in mind is that of forcing your opponent to make a SHORT RETURN so you can take advantage of shots close to the net.

(a) Short returns

3. What type of return should you try to get your opponent to make? (a) _____

4. You have a good chance of winning the point if you can train yourself to hit the shuttle ABOVE and CLOSE to the net. Playing further back in your own court gives your opponent time to see and play the shuttle.

(a) Above and close to the net.

5. In playing the shuttle where is your greatest chance of winning points? (a) _____

PROGRAM 4 (continued)

OBJECT OF THE GAME
HOW TO WIN

CRITERIA TEST FRAME 4

(Completion)

Record on answer sheet.
What are the two ways you can
WIN a RALLY on a badminton
point?

- (a) By hitting the shuttle to
the _____ within
the boundaries of your
opponent's court.
(b) By forcing your opponent
to _____.

- (a) floor
(b) error

PROGRAM 5

OBJECT OF THE GAME
THE IMPORTANCE OF SERVING

Objective

The student should be able to understand the importance of serving by stating its importance in the criteria test frame.

1. Each point in the game of badminton is begun by an UNDERHAND SERVE.

(a) Underhand serve

2. An (a) _____ is the skill used to begin each point in badminton.

3. A point can only be scored by the serving side.

(a) score a point.

4. The service is of great importance to the game of badminton because it is the only time that a side can (a) _____

5. A service is considered to have been delivered as soon as the shuttle contacts the racket.

(a) contacts

6. When the shuttle (a) _____ the racket it has been delivered.

CRITERIA TEST FRAME 5

(Completion)

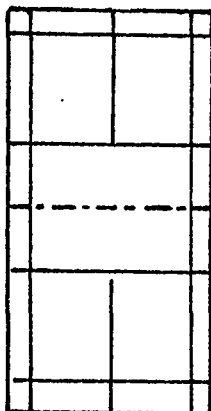
When your side is serving.

Record on answer sheet.
When can you score a point in badminton?

PROGRAM 6
THE BADMINTON COURT

Objective

The student should be able to recognize and draw a typical badminton court with a singles court superimposed over a doubles court.



1. On a typical badminton court there are two sets of lines-- one for doubles play (2 players on each team) and one for singles play (1 player on each side). The lines are superimposed on each other as the corresponding diagram shows.
-

2. Now walk around the court and get an idea of the actual court size.
-

CRITERIA TEST FRAME 6
(Picture)

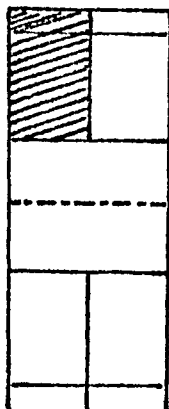
On your answer sheet draw a diagram showing both a singles and doubles court superimposed on one another.

PROGRAM 7

THE SINGLES COURT

Objective

The student should be able to recognize and draw the boundaries of a singles court and indicate the service area.



1. The singles court is long and narrow and so is the service court as shown in the diagram to the left.

(a) long and narrow
(b) service court

2. The singles court is (a) _____ and _____ and so is the (b) _____ court.

3. Now walk around the court and get an idea of the actual size and the length and width of the service area.

CRITERIA TEST FRAME 7

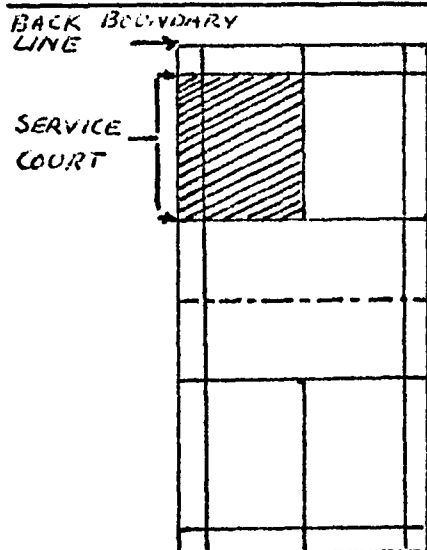
(Picture)

On your answer sheet draw the boundaries of a singles court and color in one service court.

PROGRAM 8
THE DOUBLES COURT

Objective

The student should be able to recognize and draw the boundaries of a doubles court and indicate the service area.



1. The doubles playing court is wider and the service area is just as wide but shorter by $2\frac{1}{2}$ feet in length.

2. In other words the doubles service court is SHORT and WIDE.

(a) short
(b) wide

3. The doubles service court is (a) _____ and (b) _____.

4. After the service is delivered the back boundary line is the same as the singles back boundary line. Look at the first diagram.

5. Walk around the court and get an idea of the actual size and the length and width of the service area.

CRITERIA TEST FRAME 8

(Picture)

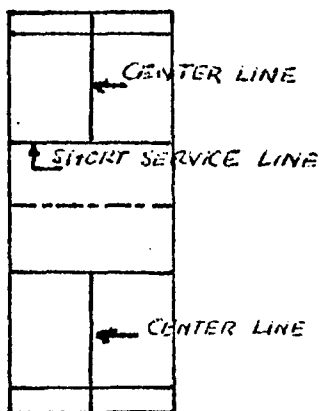
On your answer sheet draw the boundaries of a doubles court and color in one service court.

PROGRAM 9

THE BADMINTON COURT
THE CENTER LINE

Objective

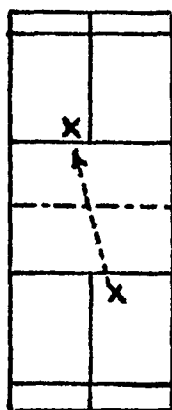
The student should be able to name and draw the "center line" and understand its function.



1. The CENTER LINE runs from the exact middle of each short service line to the exact middle of the back boundary line and divides the right service court from the left service court.

(a) Divides the right service court from the left service court.

2. What is the function of the center line? (a) _____



3. On the service the server and receiver must be to the right or left of the center line depending on the point. The server and receiver will be in opposite courts from each other as shown to the left.

CRITERIA TEST FRAME 9

(Picture)

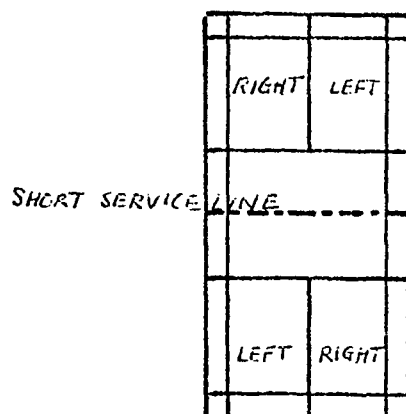
On your answer sheet draw a singles court with the server serving from the left court to the left court of the receiver.

PROGRAM 10

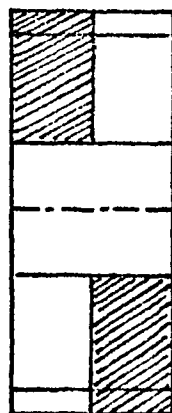
THE BADMINTON COURT
THE SERVICE COURTS FOR BOTH SINGLES AND DOUBLES

Objective

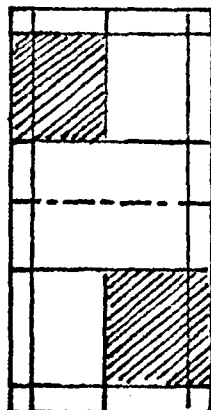
The student should be able to draw the short service line and the right and left service courts in relation to the net for both singles and doubles play.



1. The net divides the court horizontally into two equal playing areas. Each playing area is divided into two service courts behind the short service line--a right service court and a left service court as is shown to the left.



2. The singles service court is "long and skinny," as shown in the diagram to the left.



3. The doubles service court is "fat and wide," as is shown in the diagram to the left.

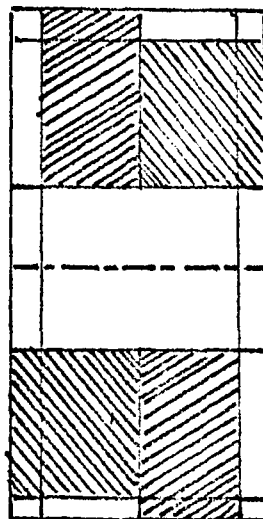
PROGRAM 10 (Continued)

THE BADMINTON COURT
THE SERVICE COURTS FOR BOTH SINGLES AND DOUBLES

CRITERIA TEST FRAME 10

(Picture)

On your answer sheet draw a complete badminton court and shade in the right service court area as the singles service court and the left service court area of the doubles as the doubles service courts.

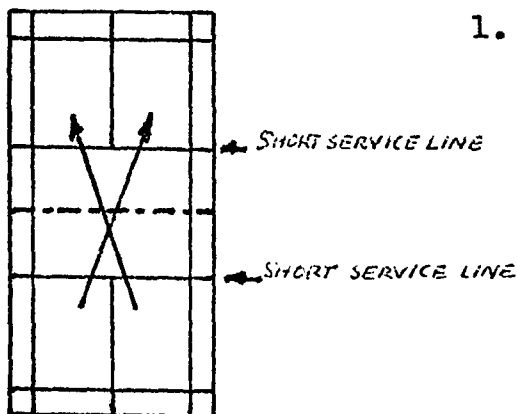


PROGRAM 11

THE BADMINTON COURT
THE SHORT SERVICE LINES

Objective

The student should be able to draw the 2 short service lines of a badminton court and understand their significance.



1. The short service line is on either side of the net and $6\frac{1}{2}$ feet from it. The service must be delivered from behind one short service line diagonally over the net into the short service court on the other side.

CRITERIA TEST FRAME 11

(Picture)

On your answer sheet show the flight of the shuttle served from the left service court to the diagonal left service court.

PROGRAM 12
FOREHAND GRIP
TECHNIQUE

Objective

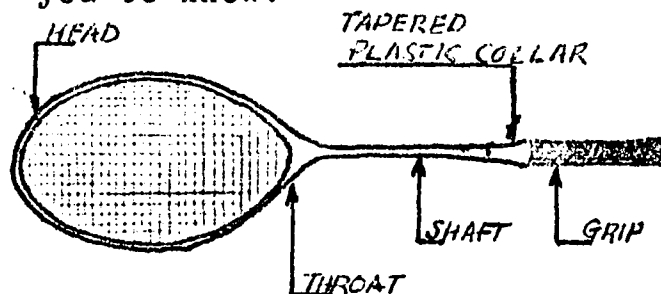
The student must be able to consistently hold the racket in the correct forehand grip position 5 times in a row simply by feel and not by having to look at the racket.

1. The forehand grip is used for strokes which are made over-head or on the right side of the body.

- (a) overheads
(b) right side

2. For what strokes is the forehand grip used? (a) _____
(b) Those on the _____ of your body.

3. These are the parts of the racket that are necessary for you to know:



4. Hold the racket by the throat in your left hand with the racket face perpendicular to the floor. This is the position it should be in on the forehand grip.

- (a) perpendicular

5. Your racket head should be (a) _____ to the floor on the forehand grip.

PROGRAM 12 (continued)

FOREHAND GRIP
TECHNIQUE

-
6. Place your right hand on the leather grip and slide it down the grip until the center of the heel of the hand is against the butt-end of the handle.
-

(a) butt-end
(b) center

7. You should slide your hand down the grip until the (a) _____ of the grip is in the (b) _____ of the heel of your hand.
-

8. Look down at your racket and hand. The racket should be lying across the palm and fingers of the right hand. The index finger should be separated a little from the others and look like a TRIGGER FINGER on a pistol.



(a) trigger finger

9. Your index finger should look like a (a) _____.
-

10. The thumb will wrap naturally around the left side of the handle and all your other fingers are slightly spread. Your grip will resemble a HANDSHAKE.
-

PROGRAM 12 (continued)

FOREHAND GRIP
TECHNIQUE

11. Look at your grip. Your index finger should be further up the handle of the racket than the thumb. The inside of the thumb and the inside of the index finger should be against the side bevels of the grip with this handshake position.

12. You will see a "V" formed by the thumb and index finger. The point of the "V" is on the top bevel of the eight-sided handle.

(a) "V"

13. What should you see formed by the thumb and index finger on the top bevel of the grip?
(a)

14. This basic grip can be made more comfortable by spreading or closing your fingers, moving your hand closer to the end of the racket, or by resting the end of the handle at a comfortable place on the heel of the hand. Do this if you have to.

15. The purpose of this grip allows your racket to become an extension of your arm. When the racket hits the shuttle, the arm, hand and racket should form a straight line.

PROGRAM 12 (continued)

FOREHAND GRIP
TECHNIQUE

16. Extend your arm. Do you see a straight line from your shoulder to the end of the racket?

17. Now let's check your forehand grip. Drop the head of the racket by lowering your elbow. If the racket head lies flat along the calf of your right leg, you are holding the racket correctly for the forehand grip.

CRITERIA TEST FRAME 12

TIMES IN A ROW

(__ times in a row)

Twirl the racket by holding it by the throat in your left hand and then take the forehand grip by feel. Check to see if it is correct by the above program.

Do this 5 different times without looking until you have taken what you think is the correct grip.

Have your partner check your grip each time and record on answer sheet.

PROGRAM 13

FOREHAND GRIP
WRIST SNAP

Objective

The student must be able to demonstrate how the proper forehand grip allows for greater wrist movement by making a "swishing" sound with the head of the racket 5 times in a row in a horizontal plane.

1. Hold the racket as near the end of the grip as possible. Now move the racket head to determine the difference in wrist action. Is it easier to bend your wrist?
-

2. To make progress in badminton you must develop forearm rotation and wrist cock as far back as possible before actually "breaking the wrist" to contact the shuttle.
-

3. Pretend that you are hitting an imaginary shuttle and listen to the sound that you will hopefully make with the head of the racket. There should be a high pitched "swishing" sound. If this is true your wrist is being used correctly. If not, you are not using enough wrist action.
-

CRITERIA TEST FRAME 13

TIMES IN A ROW

(__ times in a row)

Hold the racket with your forehand grip and snap your wrist sideways in a horizontal plane. Keep doing this until you can show your partner that you have the ability to make a "swishing" sound with your racket head 5 times in a row. If you are unsuccessful repeat the exercise but no more than 3 times. Record trials on answer sheet.

PROGRAM 14
FOREHAND GRIP
EYE-HAND COORDINATION

Objective

The student must be able to demonstrate wrist flexibility and eye-hand coordination with a proper forehand grip by hitting a shuttle up and down on his racket face in an underhand manner 5 times in a row.

CRITERIA TEST FRAME 14

TIMES IN A ROW

(__ times in a row)

Using an up and down motion, try to hit a shuttle 5 times in a row in the center of your racket. Use the forehand grip. If you are unsuccessful repeat the exercise but no more than 3 times. Record trials on answer sheet.

PROGRAM 15
BACKHAND GRIP
TECHNIQUE

Objective

The student must be able to consistently hold the racket in a correct backhand grip position without looking at the racket and without the use of the left hand 5 times in a row.

1. The backhand grip is used for all shots on the left side of the body with the exception of the around-the-head stroke which you will learn to do later.

2. The backhand grip allows for an increase in elbow movement which is good because the wrist action on the left side of the body is less than on the right. Your wrist can only be taken back half as much on your backhand as opposed to your forehand side.

3. When you change to the backhand grip or from one grip to the other you do not use your left hand. You must learn to just loosen your hold on the racket, turn the handle slightly, and take the new grip.

(a) No

4. Does your left hand aid in the changing of one grip to the other? (a) _____

PROGRAM 15 (continued)

BACKHAND GRIP
TECHNIQUE

5. You must realize that the shuttle is contacted with the opposite side of the racket face than that used for the forehand shots.

False

6. True or false:
The same side of the racket is used for both forehand and backhand shots.

7. First take a forehand grip on your racket. Turn your hand counterclockwise (left) until the point of the "V" is on the top left bevel. Place the ball of your thumb against the back bevel of the handle.

(a) Left
(b) Back

8. From a forehand grip which way is your hand turned to assume a backhand grip? (a) _____

Which bevel of the racket is your thumb placed against on the backhand grip? (b) _____

9. You will notice that your thumb is moved from the wrapped-around side position in a forehand grip to a more straightened position on the upper left corner of the handle.

This grip allows you to use the INSIDE pad of your thumb as leverage when rotating the hand and forearm on a backhand stroke. It gives you more power and control of the racket head forward.

PROGRAM 15 (continued)

BACKHAND GRIP
TECHNIQUE

10. Look at your backhand grip. On this grip your index finger is LOWER down on the handle than the thumb.

11. Look at the back of your hand. It should be parallel to the ceiling and the racket head will be almost vertical to the floor.

(a) The back

12. What part of your hand will be parallel to the ceiling?
(a) _____

CRITERIA TEST FRAME 15

(Successful or
Unsuccessful)

Twirl the racket by holding it by the throat in your left hand and then take the backhand grip by feel. Check to see if it is correct by the above program. Do this 5 different times without looking each time until you have what you think is the correct grip. Record on answer sheet.

PROGRAM 16
BACKHAND GRIP
WRIST SNAP

Objective

The student must be able to show that the function of the thumb on the backhand grip allows for greater wrist movement on the forward snap of the wrist by making a "swishing" sound of the racket 5 times in a row.

1. This thumb position on the backhand gives you the support needed to gain speed on drives and depth on clears.
-

CRITERIA TEST FRAME 16

TIMES IN A ROW

(__ times in a row)

Show your partner that the function of the thumb in this manner does allow for greater wrist movement on the forward snap of the wrist by making a "swishing" sound with your racket head 5 times in a row. If you are unsuccessful repeat the exercise but no more than 3 times. Record your trials on answer sheet.

PROGRAM 17

BACKHAND
EYE-HAND COORDINATION

Objective

The student must be able to use the backhand grip and hit a shuttlecock up and down 5 times in a row.

CRITERIA TEST FRAME 17

TIMES IN A ROW
(__ times in a row)

Take a backhand grip and hit a shuttlecock in the center of your racket up and down 5 times in a row. If you are unsuccessful repeat the exercise but no more than 3 times. Record your trials on your answer sheet.

PROGRAM 18
SWITCHING GRIPS

Objective

The student must be able to show that he can quickly switch from forehand to backhand grips, without looking at the racket and without the use of his left hand, just by the movement of his thumb.

1. Hold your racket in a forehand grip and switch to a backhand grip simply by moving your thumb to the back bevel for the backhand grip. Repeat this a number of times until it feels natural, and you can do it without looking.
-

CRITERIA TEST FRAME 18

(Successful or
Unsuccessful)

Take your forehand grip and swing the racket on the right side of your body. Face the net and then switch to your backhand grip and swing the racket on the left side of your body. Repeat this a number of times until the grip switch feels natural and be sure that your left hand never comes in contact with your racket in this exercise.

When you are ready have your partner check your grips at the end of each swing.

Record on your answer sheet.

PROGRAM 19

FUNDAMENTALS OF STROKING
SHUTTLE AND RACKET CONTACT

Objective

The student must be able to understand that the shuttle should be hit at right angles with the racket head (i.e., with a flat surface) to achieve maximum power by giving this correct answer to the criteria test frame.

1. Learn to hit the shuttle with a flat surface (at right angles) of your racket face in order to achieve maximum power.
-

CRITERIA TEST FRAME 19

(Completion)

With a flat face or at right angles.

Record on your answer sheet.
How should you contact racket face against shuttle?

PROGRAM 20

FUNDAMENTALS OF STROKING
BODY POSITION AND WEIGHT TRANSFER

Objective

The student must realize that the most important fundamental of stroking is to get the body BEHIND the shuttle on all shots and to TRANSFER the body weight from the back foot to the front foot AS the shuttlecock is hit by giving this correct answer in the criteria test frame.

1. The first and most important fundamental of stroking is to get the body BEHIND the shuttle on all shots.

- | | |
|------------------------|--|
| (a) Behind the shuttle | 2. Where should your body be in relation to the shuttle when you prepare to hit it?
(a) _____ |
|------------------------|--|

3. On all shots the weight transfer should be from the BACK foot onto the FRONT foot AS the shuttle is hit.

CRITERIA TEST FRAME 20

(Completion)

- (a) back to front
(b) as

Record on answer sheet.
Weight transfer is from (a) _____
foot (b) _____ the shuttle is hit.

PROGRAM 21

THE READY POSITION
THE BODY STANCE

Objective

The student should understand the principles of a relaxed ready position by answering the criteria test frame correctly.

1. The stance for the ready position is as follows:
The knees are slightly bent and ready for action in any direction. Your body is relaxed and the feet are far enough apart to give good balance; your weight is evenly distributed on the balls of your feet.
-

CRITERIA TEST FRAME 21

(Completion)

Record on answer sheet.
Complete the following statement:

The knees are slightly (a) _____
and the body is (b) _____

- (a) bent
(b) relaxed

PROGRAM 22

THE READY POSITION
THE RACKET POSITION

Objective

The student should understand the correct "ready position" for holding the racket by answering the criteria test frame correctly.

1. Hold your racket for the "ready position" with its head up at net tape level slightly to the backhand side of your body.
-

CRITERIA TEST FRAME 22

(Multiple Choice)

Which of the following describes the proper position of the racket in the "ready position." Record on answer sheet.

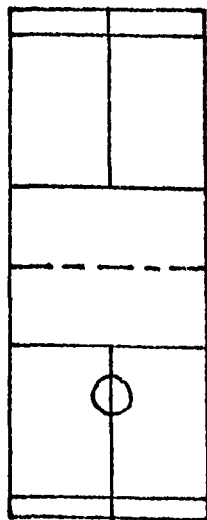
- (a) racket head at waist level in center of body.
 - (b) racket head below waist level in center of body.
 - (c) racket head up at net tape level and slightly to the backhand side of the body.
 - (d) racket head up with extended arm in the center of the body.
- (c) racket head at net tape level slightly to the backhand side of the body.

PROGRAM 23

SINGLES
READY OR HOME POSITION

Objective

The student must be able to show the proper "ready or home position" in a singles game both on paper and on the court.



1. In singles your base or "ready or home position" is 2-3 feet behind the center of the court striding the center line. You are asked to stand beyond center because most people move forward better than they do backwards.

Take this position on the court and hold your racket in the correct ready or home position after each shot.

CRITERIA TEST FRAME 23

(Picture)

On your answer sheet draw a picture of a singles court and place an X in the proper ready position for singles game play.

PROGRAM 24

READY POSITION
SHUTTLE CONCENTRATION

Objective

The student must know that he has to concentrate on the shuttle as it leaves the opponent's racket and not on the opponent by answering the criteria test frame correctly.

1. It is important that your eyes concentrate on the SHUTTLE AS it leaves your opponent's racket so you can determine its direction.
-

CRITERIA TEST FRAME 24

(Multiple choice)

What should your eyes concentrate on when the shuttle leaves the opponent's racket? Record on answer sheet.

- (a) your opponent's eyes
- (b) the wrist snap and racket control of the opponent
- (c) the shuttle
- (d) the trunk of your opponent.

(c) the shuttle

PROGRAM 25
READY POSITION
WHEN TO MOVE

Objective

The student must be able to sense when to start moving after the opponent has struck the shuttle by answering the criteria test frame correctly.

1. Hold your position until you see the direction of the shuttle. You should move your feet as soon as the direction of the shuttle can be determined. As the shuttle crosses the net your body should turn to move.

- | | |
|---|--|
| (a) As soon as direction is determined. | 2. When do you move your feet?
<u>(a)</u> |
|---|--|

- | | |
|---------------------------------------|--|
| (a) When the shuttle crosses the net. | 3. When do you move your body?
<u>(a)</u> |
|---------------------------------------|--|

CRITERIA TEST FRAME 25
(Multiple Choice)

How soon should you move when the shuttle is to be hit by your opponent. Record on answer sheet.

- | | |
|--|---|
| (c) after you have determined its flight | <ol style="list-style-type: none"> (a) just as he is preparing to hit it (b) just as he strikes the shuttle (c) after you have determined its flight (d) when it crosses the net. |
|--|---|

PROGRAM 26 (Requires Court Space)

READY POSITION
RETURN OF SERVICE

Objective

The student must show he is able to assume the proper ready position for the return of service, by getting the instructor's approval.

1. In assuming your stance for return of service you must be able to reach any low service as high and as early as possible. This position must also allow you to move backwards to hit down on any high service.

2. Your racket position must be at net-tape height. Some players prefer to have a fully extended arm.

3. Stand in a stride position with the left foot forward. Most of your body weight will be balanced over your front foot. Bend your left knee so that it will act as a spring for you in the return of services that can be put away.

PROGRAM 26 (continued)

READY POSITION
RETURN OF SERVICE

CRITERIA TEST FRAME 26

(Successful or
Unsuccessful)

Have your teacher check your ready position. She may choose to hit long and short services to see if you are mobile from your position.

or

Have your partner hit both long and short services to you until you feel comfortable in your return of service stance and agile enough to handle and return the service situation.

Record on answer sheet.

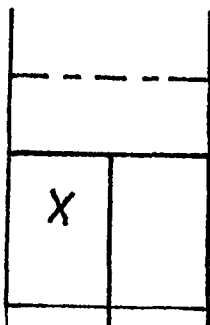
PROGRAM 27 (Requires Court Space)

 PROPER READY POSITION
 RETURN OF SERVES
 SINGLES

Objective

The student must be able to take the correct position for receiving the singles service from both the right and left courts and return 5 out of 10 serves successfully from each court.

1. Now we have to decide what is the best receiving position for you in singles. Since the singles area is longer and narrower than the doubles area, most people take a position 4-5 feet behind the short service line. This will vary somewhat according to your height and ability to back pedal. (running backwards)

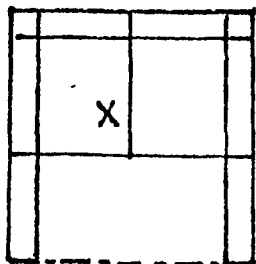


2. Look over the entire area of the left singles court. For best coverage and for the fewest use of backhand returns stand 3' from the short service line and 3' from the center service line.

- (a) 5 feet
(b) 3 feet

3. How far should you stand from the short service line? (a) _____
How far should you stand from the center service line? (b) _____

PROGRAM 27 (continued)

 PROPER READY POSITION
 RETURN OF SERVES
 SINGLES


4. Look over the entire area of the right singles court. For best coverage and for the most use of your forehand, stand about 5 feet from the short service line and one foot from the center service line.

- (a) 5 feet
 (b) 1 foot

5. How far should you stand from the short service line? (a)
 How far should you stand from the center service line? (b)

CRITERIA TEST FRAME 27

TASK

(__ out of 10)

Have your partner hit you every type of singles service while you are in ready position in one court or the other and see if you feel comfortable in taking this position and are successful in returning the services 5 out of 10 times. Record scores on your answer sheet.

PROGRAM 28

FOOTWORK
ITS IMPORTANCE

Objective

The student should be able to realize the importance of footwork to get into position for shot preparation and in controlling the play of his opponent, by answering the criteria test frame correctly.

1. Footwork is important to help you get into position so that you can hit the shuttle in the most efficient manner and control the play of your opponent.
-

CRITERIA TEST FRAME 28

(Completion)

To help you get into position.

Why is footwork so important?
Record on your answer sheet.

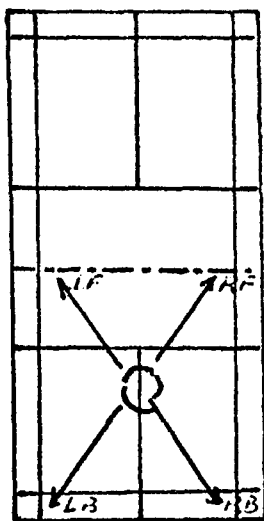
PROGRAM 29 (Requires Court Space)

FOOTWORK
HOME OR CENTER POSITION

Objective

The student must be able to realize the necessity of a good center position and show by a command drill that he can get to the corners of the court and back to center position after each pretend shot with his racket in ready position 8 times.

1. You must learn to recover quickly and be able to return to center position after retrieving corner shots so that you can close down the angle of return that was made available to your opponent.



2. Take your basic center position and upon command of your partner maneuver to the four different corners of the court and back to center position after each command. It should take you $1\frac{1}{2}$ steps to get to each corner from your center position.

Your partner can use the following commands in any order:

Right front
Left front
Right back
Left back

PROGRAM 29 (continued)

FOOTWORK
HOME OR CENTER POSITION

CRITERIA FRAME 29

(Successful or
Unsuccessful)

Practice your ability to move in each direction from the center position by reacting to the four corners in a clockwise direction first and a counter-clockwise direction second. Practice this for both agility and endurance a total of 8 times. Record on your answer sheet.

_____ successful
_____ unsuccessful

COUNTER
CLOCKWISE

CLOCKWISE

PROGRAM 30 (Requires Court Space)

FOOTWORK DRILLS

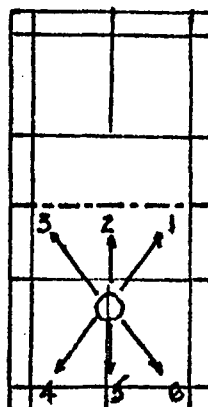
Objective

Through experimentation the student should be able to get into position for the last step with the right foot forward before hitting the shuttle and successfully return the shuttle from each position while returning to home each time.

1. Now you must determine what is the best way for you to move forward and backwards. It depends on your physical makeup as to whether it is better to take fewer long steps or lots of short steps. It also depends on the type of return you desire to make.
-

2. There are 6 basic spots to which you must be able to move effectively, play your shot, and return to the center of the court.

Study the diagrams below.



PROGRAM 30 (continued)

FOOTWORK DRILLS

-
3. One of the most important principles of footwork is to keep your weight forward on the balls of your feet. NEVER let your weight sink back onto your heels.
-
4. Make yourself HURRY to get into balanced position, then take time to stroke. You must try to move faster than the shuttle. Your aim is to move back beyond the shuttle and to be equally aware of moving forward into the shuttle as you play your stroke.
-
5. When you practice your footwork make sure your last step before the shuttle is STRUCK is always taken with the right foot. This is your racket foot.
-
- (a) The racket foot or the RIGHT FOOT. 6. What foot takes the last step before the shuttle is struck?
(a) _____
-
7. When you know which direction you want to go and to get into the proper position for the shot, step off with the foot nearest the position you want. You can learn to do this by developing an easy bouncing action in the knees and thus learn to move easily in any direction.
-

PROGRAM 30 (continued)
FOOTWORK DRILLS

8. BOUNCING best describes badminton footwork. It will give you an alert starting position to move in any direction and it may save you a fraction of a second that makes the difference between a kill and a defensive shot.
-

- (a) The nearest foot
(b) Bouncing

9. What foot do you step off with? (a) _____

What term best describes badminton footwork? (b) _____

10. In order to move to the baseline, take a sideways skipping action with the feet kept close to the floor.
-

- (a) Sideways skipping action.

11. How should you move towards the baseline? (a) _____
-

12. "Back-Pedaling" is the name of the skill for moving backwards. While doing it you must keep your head and eyes forward.
-

- (a) Back-pedal

13. To move backwards what must you do? (a) _____
-

14. If you are hitting a forehand clear correctly, your feet will be moving forward 2 steps which puts you on your way to your base position near the center of the court.
-

PROGRAM 30 (continued)
FOOTWORK DRILLS

15. To hit a forehand or overhead stroke in the deep right court, skip diagonally back to the right with the right foot leading. Finish with the left side partially turned toward the net with the left foot forward.

16. Have your partner hit a series of clears to the right hand corner. Hit a clear down the line to the back corner for your return.

17. To practice footwork for the backhand drive or clear from the deep left court, skip diagonally back, left foot leading, with the right side to the net and right foot diagonally forward.

18. Have your partner hit a series of clears to the left hand corner. Hit a clear down the line to the back corner for your return.

19. When more than one step is required to reach the shuttle make your last stop the longest with both the back foot and the front foot arriving in position to complete the stroking of the shuttle.

Shorter steps at the beginning of the run will give you a quicker start and give you enough time to adjust your feet in preparation for shuttle contact.

PROGRAM 30 (continued)
FOOTWORK DRILLS

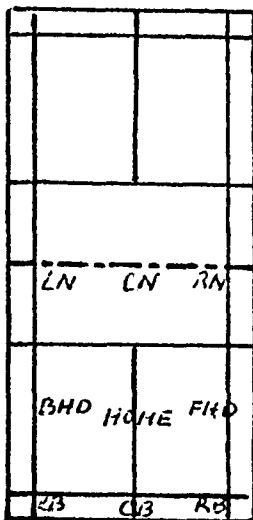
20. After you hit the shuttle you must immediately move towards your base. This will give you the best opportunity for handling the return shot.

IMPORTANT. If you have not reached your base before your opponent strikes the shuttle you must pause for a moment while he plays his stroke.

If you do not pause, you may find yourself going in the **WRONG DIRECTION.**

21. The forehand net shot is an exception to the basic footwork, right foot back, left foot forward. You can reach farther with the right foot forward for the inch or two of stretch that you need toward the net.
-

CRITERIA TEST FRAME 30
(Footwork Sequences)



The footwork pattern consists of leaving "home position" upon command by your partner to the designated spot on the court, taking an imaginary swing at the shuttle and returning to home position at which time there will be an immediate second command, etc.

Record the sequences you attempted on your answer sheet.

PROGRAM 30 (continued)
FOOTWORK DRILLS

FOOTWORK SEQUENCE

1
Center clear
Center net
Center clear
Center net
Center clear
Center net
Center clear
Center net

2
Right back
Center net
Right net
Left back
Left net
Forehand drive
Backhand drive
Center back

3
Left back
Forehand drive
Right net
Center back
Backhand drive
Left net
Right back
Center net

4
Forehand drive
Center net
Right net
Right back
Center back
Left back
Left net
Backhand drive

5
Left net
Forehand drive
Center net
Left back
Right net
Right back
Center back
Backhand drive

6
Backhand drive
Left net
Right net
Left back
Center back
Forehand drive
Center net
Right back

7
Center net
Right back
Forehand drive
Left back
Center back
Backhand drive
Left net
Right net

8
Center back
Center net
Right back
Left back
Right net
Left net
Forehand drive
Backhand drive

9
Right back
Center net
Left back
Right net
Center back
Backhand drive
Forehand drive
Left net

10
Center back
Center net
Center net
Center net
Center back
Center back
Center back
Center back

PROGRAM 31
SERVICE RULES
RACKET POSITION

Objective

The student should be able to recognize the racket head position of a correctly hit service and that of an incorrectly hit service and because of this develop a legal service.

1. The serve is an underhand stroke that begins each play.

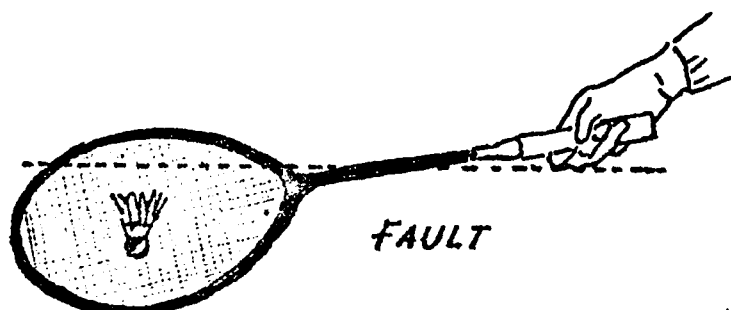
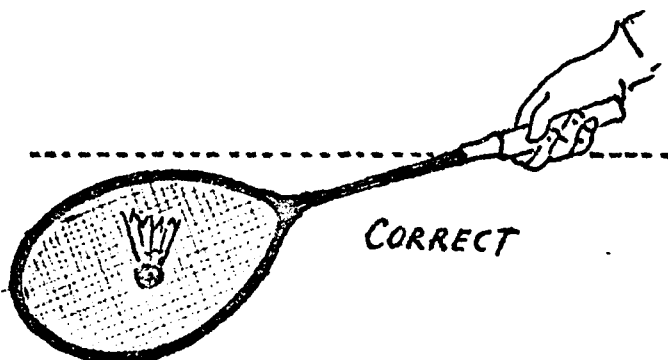
(a) serve

2. Play is started by a (a) _____ which is an underhand stroke.

There are a few basic rules that apply to the service and they will be presented in the next series of frames.

LAW 14--DELIVERY OF SERVICE

3. The head of the racket must be below the server's hand at contact point.

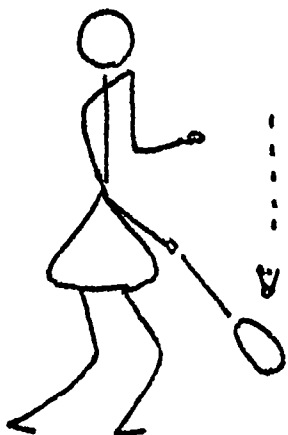


PROGRAM 31 (continued)

SERVICE RULES
RACKET POSITION

(a) head of the racket
(b) below

4. At contact point the (a) _____ must be (b) _____ the server's hand.



5. The contact point with the shuttle must be below the waist of the server.

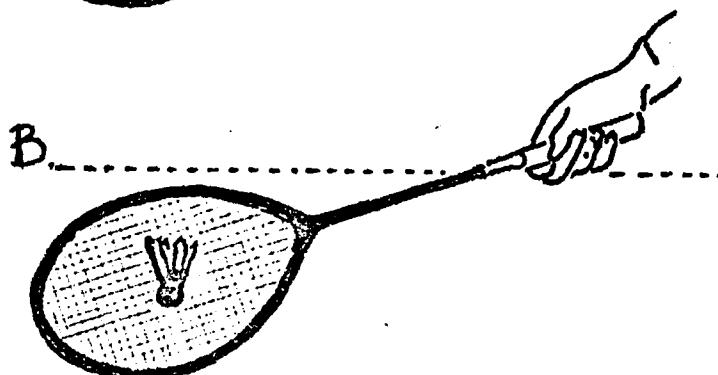
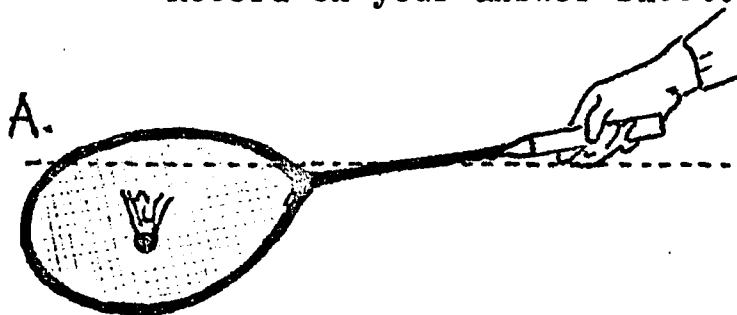
(a) below
(b) contact

6. The shuttle must be struck (a) _____ the waist of the server at (b) _____ point.

CRITERIA TEST FRAME 31

(Multiple Choice)

Which of the following is a legal racket head position when contacting the shuttle. Record on your answer sheet.



PROGRAM 32 (Requires Court Space)

SERVING RULES--FEET

Objective

The student must be able to understand the service rules regarding the feet for both the server and the receiver through peer group observation and correction.

1. On a service a player's feet must remain in contact with the floor until the shuttle is contacted. This is true of both the server and the receiver.

(a) contact
(b) feet

2. The (a) _____ point of the shuttle on the serve is the time when the server and the receiver's (b) _____ can lose contact with the floor.

3. The serve can legally be played underhand forehand or underhand backhand.

(a) Underhand forehand
(b) underhand backhand

4. (a) _____ and (b) _____ are the two legal ways of serving.

5. Most people serve by the underhand forehand method.

(a) underhand forehand

6. The (a) _____ method is the usual way of serving.

7. The server and the receiver must be in their respective courts at the time of service and no part of the feet may be on or touching a line of the service court.

PROGRAM 32 (continued)

SERVING RULES--FEET

-
- (a) on
(b) touching
(c) server's
(d) receiver's
8. At the time of service, no part of the feet may be (a) _____ or (b) _____ a line of the (c) _____ or (d) _____ respective service courts.
-
9. The receiver may not move across the short service line until the shuttle has been struck and some part of his feet must remain in stationary contact with the floor until the serve has been delivered.
-
- (a) struck
(b) move
(c) short service line
(d) stationary contact
10. After the shuttle has been (a) _____ the receiver may (b) _____ across the (c) _____. Up to this time some part of his feet must have remained in (d) _____ with the floor.
-

CRITERIA TEST FRAME 32

(Successful or
Unsuccessful)

With a partner serve 5 services and apply the service rules you have learned. Let your partner return the services for practice. The other two people assigned to your court will observe the server and receiver for proper foot regulations on each service. Rotate partners when each has had a chance to serve and receive. Record on your answer sheet.

PROGRAM 33

HOLDING THE SHUTTLE AND RELEASING IT PROPERLY

Objective

The student must be able to show his partner how to hold the shuttle and release it properly plus have the understanding of how it is done by answering the criteria test frame correctly.

1. Hold the shuttle at its base between your thumb and forefinger. The cork base should be pointing straight down toward the floor. Extend your left arm with a slight bend in the elbow at shoulder level in line with your right shoulder.

- (a) At its base
- (b) Straight down
- (c) Shoulder height
- (d) Right shoulder
- (e) Between thumb and forefinger

2. Have your partner ask you the following questions:
 - (a) Where should you hold the shuttle? _____
 - (b) Which way is the base pointing? _____
 - (c) How high is your left arm extended? _____
 - (d) With what part of your body should the shuttle be in line? _____
 - (e) How do you hold the shuttle? _____

3. Assume the same position that you did in frame one. Now open your fingers and let the shuttle fall to the floor.

- (a) fingers
- (b) fall

4. Complete the following statement:

To release the shuttle properly, open your (a) _____ and let it (b) _____ to the floor.

PROGRAM 33 (continued)

HOLDING THE SHUTTLE AND RELEASING IT PROPERLY

-
5. The shuttle should have landed two feet ahead of your right foot.
-

Two feet ahead of the right foot.

6. Where should the shuttle land?
-

CRITERIA TEST FRAME 33A

(Successful or Unsuccessful)

Where did your shuttle land? If it is in the wrong place try dropping it as you have learned it through the preceding frames and repeat the skill until your partner says that you have done it correctly. Record on your answer sheet.

CRITERIA TEST FRAME 33B

(Completion)

- (a) base
- (b) thumb
- (c) forefinger
- (d) shoulder
- (e) floor

Supply the missing words on your answer sheet.

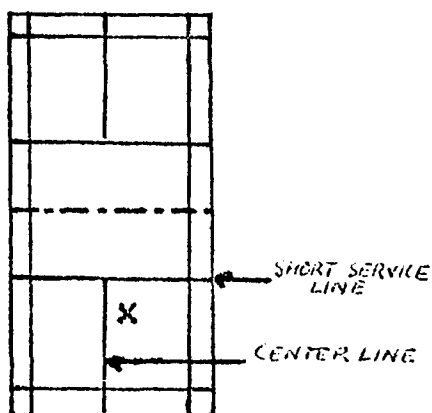
The shuttle is held at the (a) _____ between the (b) _____ and (c) _____ of the left hand at about (d) _____ level with the cork base pointing to the (e) _____.

PROGRAM 34 (Requires Court Space)

SERVING THE SHUTTLE

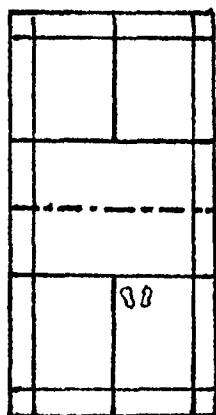
Objective

On the underhand service the student must be able to shift his body weight and time the forward swing of the racket with contact of the shuttle making it go over the net 5 out of 10 times.



1. And now you are ready to learn how to put the shuttle into play.

Take a comfortable position in your right hand service court about 3 feet behind the short service line and 1 foot to the right of the center line.



2. Stand with your feet comfortably apart with your left foot ahead of the right and your weight slightly over your back foot. Your left toes are pointing toward the net and your right toes are pointing diagonally toward the right side line. (about a 45 degree angle with the net). Face the diagonal court to your left.

3. The racket is held with a forehand grip with the wrist slightly cocked so that the head of the racket points away from the net and is at about waist level.

PROGRAM 34 (continued)

SERVING THE SHUTTLE

-
- (a) Forehand grip
(b) Cocked
(c) Away from the net
(d) Waist level
4. What grip do you use on a service? (a) _____
Is your wrist straight or cocked? (b) _____
Where is the racket head pointing? (c) _____
How high is the racket head? (d) _____
-
5. Swing your racket downward and forward easily while your weight is shifting from your right to the left foot. Your wrist is still cocked. Repeat this 5 times.
-
- (a) Downward and forward
(b) Right to left
(c) Cocked
6. How is the racket swung? (a) _____
Which way does your weight shift? (b) _____
Is your wrist straight or cocked? (c) _____
-
7. As your racket contacts the shuttle, your wrist comes forward easily and guides the shuttle over the net.
-
- (a) When it contacts the shuttle
(b) Guide
8. When does your wrist come forward? (a) _____
Do you hit or guide it over the net? (b) _____
-
9. Watch your partner practice serving. Her racket head will meet the falling shuttle at arm's length ahead of the body and at knee level.
-

PROGRAM 35 (Requires Court Space)

THE SERVICE
STARTING A RALLY

Objective

The student must be able to start a rally with an underhand service that covers the distance from her own short service line to the diagonal court's short service line. The student must be successful 5 out of 10 times for both the right and left service courts.

1. Now attempt to do the whole service.

Start with your racket back and hold the shuttle in the correct position. The timing is . . .

DROP - SWING FORWARD

DROP - SWING FORWARD

2. What is the timing of the service?
_____ - _____

3. Practice this 5 or 6 times. If you have been successful the contact point will be at knee level ahead and away from the body.

Knee level

4. At what body level is contact point? _____

5. Since the shuttle must be hit up and over the net, the follow-through will be a natural movement towards the net.

Towards the net.

6. Where is the follow through?

PROGRAM 35 (continued)

THE SERVICE
STARTING A RALLY

7. Make yourself practice all services with the same preparation from this point on. Before you finish with this program you will learn to do many different types of services--all with the same preparatory backswing.

8. Keep in mind that the play does not start until the server contacts the shuttle. The stroke should be deliberate and carefully executed.

(a) Deliberate and
(b) carefully

9. How should the stroke be executed? (a) _____ and (b) _____.

10. When first learning to serve, look at the spot to which you are serving and not at the net. Later you will learn to camouflage your actions.

The spot you are serving to.

11. What should you look at when you serve? _____

PROGRAM 35 (continued)

THE SERVICE
STARTING A RALLY

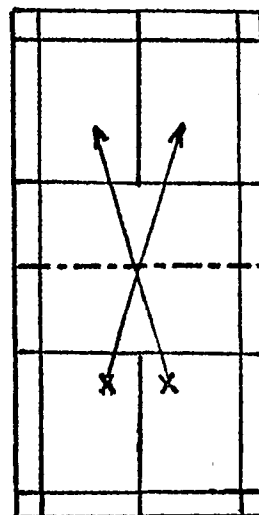
CRITERIA TEST FRAME 35

TASK

(__ out of 10)

Right and Left Courts

Attempt to get 5 out of 10 services from your right hand service court to the diagonal right service court. Then attempt to do the same from your left hand service court. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.

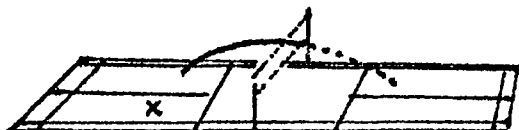


PROGRAM 36

THE SHORT DOUBLES SERVE
THEORY

Objective

The student must be able to understand the trajectory of the short doubles serve by answering the criteria test frame correctly.



1. On a good short service the TRAJECTORY or path is FLAT for doubles. It should reach its highest maximum point on the server's side of the net and start to fall as it crosses over the net close to the tape and falls within 6 inches past the short service line. A perfect serve would drop on the short service line.

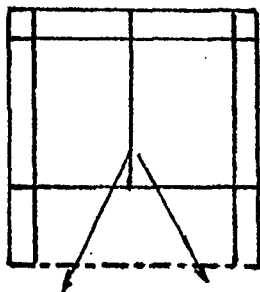
- a. Your side
- b. On the short service line
- c. Within 6 inches

2. Answer the following questions:

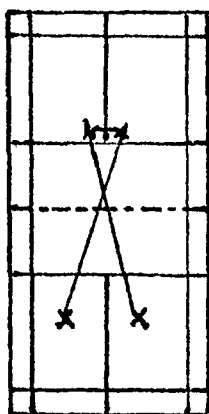
- a. Should your short serve reach its highest point on your side of the net or on your opponent's side of the net? _____
- b. Where would a perfect serve drop? _____
- c. How close to the short service line should you try to get your services? _____

3. There are two basic strategies for low doubles service. When you are serving from your right half court the best place you can serve a low serve is to the backhand of a righthanded player. When you are serving from your left half court, you should serve to the forehand of a righthanded player.

PROGRAM 36 (continued)

THE SHORT DOUBLES SERVE
THEORY

4. By keeping the service in the approximate middle of the playing court you are limiting the amount of angle available for your opponent's return. This is the area of the upside down "T".



5. The short service in doubles should be directed to a point in the diagonal service court within 6 inches of the line and in the corner where the short service and center line meet.

6. In doubles serving you start closer to the net than in singles. The distance is about 1-2 feet from your own short service line.

1-2 feet back

7. Where is your starting position for the short service in relation to your own short service line? _____

8. The reason the server stands so close to the net on this service is that he is responsible for all net shots if he serves low.

The motto is "Serve low, cover the net."

PROGRAM 36 (continued)
THE SHORT DOUBLES SERVE
THEORY

He is responsible for
all net shots.

9. What is the main reason that
the server stands so close to
the net when he begins his
low serve? _____
-

CRITERIA TEST FRAME 36
(Completion)

- (a) flat
(b) server's side
(c) 6 inches

10. The trajectory of a good short
service is (a) _____.

The short service should reach
its highest point on the
(b) _____ of the net.

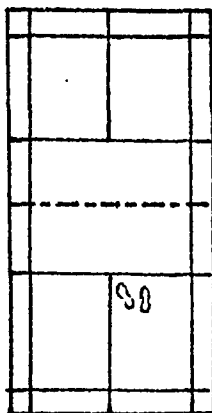
It should fall within (c) _____
inches of the upside down "T"
area.

PROGRAM 37 (Requires Court Space)

THE SHORT DOUBLES SERVE
MECHANICS

Objective

The student should be able to serve 5 out of 10 short doubles serves in the green target areas for both the right and left service courts.

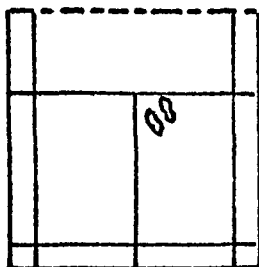


1. Your stance for the short service should be erect otherwise your trajectory will have too much of an arc before the shuttle can start to fall. Your left foot is forward with the toes pointing toward the net and the right foot is back with the toes pointing diagonally toward the right side line. You must feel comfortable in finding the right distance for your feet.

- (a) Erect
- (b) Left
- (c) right side line

2. Answer the following questions:

- (a) Should your stance be bent or erect? (a)
- (b) What foot is forward? (b)
- (c) The toes of your right foot are pointing diagonally toward the (c)



3. As was mentioned before, you must find the most comfortable position for you in delivering the short serve. Some players have the right foot forward because this helps to bring the serving arm closer to the net which lessens the trajectory distance of the shuttle to the net.

PROGRAM 37 (continued)

THE SHORT DOUBLES SERVE
MECHANICS

- (a) Yes
 (b) Distance is closer to the net.
4. (a) Do some people serve with their right foot forward?
 (b) Why? _____

5. You may want to have your feet closer together since power is not needed and you may want to face the net more for the same reason.

Try some different positions to see which is the most comfortable for you.

6. A good short serve for doubles should be contacted CLOSE to waist level and IN FRONT OF THE BODY.

Remember that the service rule says the shuttle must be contacted BELOW the WAIST and the head of the racket must be below the wrist.

- (a) Waist
 (b) wrist
 (c) waist
7. Answer the following questions:
- (a) At what level should the serve be contacted close to? _____
- (b) The head of the racket must be lower than the _____ at contact.
- (c) And the shuttle must have contacted below the _____.

PROGRAM 37 (continued)

THE SHORT DOUBLES SERVE
MECHANICS

-
8. Practice for this service has no limit. You must learn to control the flight of the shuttle over the net to insure proper placement. Get all ideas of POWER out of your mind. You must learn to take your time because the rally does not start until the service is delivered.
-
9. The shuttle is held at CHEST level for the doubles low serve and the racket does not have to be held back very far as in the long singles serve.
-
- (a) chest 10. At what body level is the shuttle held for the doubles low serve? (a)
-
11. Wrist movement forward is NOT necessary in this stroke. The swing should be started by the body and arm to guide the shuttle over the net in as flat an arc as possible. It should JUST reach the short service line.
-
12. The shuttle is GUIDED over the net because the forward swing is a gentle sweeping motion with the wrist still in a COCKED POSITION. The follow-through is SHORT but towards the net in the desired direction. There is little, if any, transfer of weight or body rotation.
-

PROGRAM 37 (continued)

THE SHORT DOUBLES SERVE
MECHANICS

-
- (a) No
(b) short
(c) net

13. Does your wrist uncock on the doubles low serve? (a) _____

The follow-through is (b) _____
and in the direction of the
(c) _____

14. If your serve requires that you transfer your weight from back to front foot, that transfer should occur just before the shuttle is contacted.

Some people prefer to serve with their weight on their forward foot to begin with. This helps keep the trajectory low.

- (a) Before

15. Should weight transfer occur before or after the shuttle is contacted? (a) _____

16. Do not move either foot until the shuttle is contacted. You may shift your weight to the balls of your feet.

- (a) No
(b) Yes

17. Can you move your feet from the floor while serving? (a) _____
Are you allowed to shift your weight? (b) _____

18. Practice your short serve until you have timed the dropping of the shuttle and the forward swing so that it feels comfortable, natural, and shows no signs of hurried movements.

PROGRAM 37 (continued)

THE SHORT DOUBLES SERVE
MECHANICS

-
19. Put a string 12" high over the net and practice serving with your partner trying to get the shuttle between the net and the string and in the proper court all within 6" of the short service line. Use the green targets.
-
20. Since the service is an underhand stroke it is hit upward and therefore is considered a defensive shot.
-
- (a) upward
(b) defensive
21. Since the service must be hit
(a) _____ it becomes a
(b) _____ shot.
-
22. But a GOOD short service often forces the opponent to play the shuttle upward for a return shot which in turn will put him on the defensive and give you the advantage to win the rally.
-
23. Besides causing the receiving side to become defensive by having to hit up, the service court in doubles is shortened in the back area by 2½ feet which limits the effectiveness of other types of serves.
-
24. If your service happens to hit the top of the net as it goes over and falls into the proper service court it is in play.
-

PROGRAM 37 (continued)

THE SHORT DOUBLES SERVE
MECHANICS

-
25. If your services are landing too far away from the short service line, hit the shuttle with a slight sidearm motion for a flatter trajectory being careful to keep the racket head below the wrist.
-

CRITERIA TEST FRAME 37

TASK
(__ out of 10)

Right and Left Courts

With your partner recording attempt to get 5 out of 10 short serves in the green target areas for both the right and left service courts. If you are unsuccessful repeat the exercise but no more than 3 times. Record your trials on your answer sheet.

PROGRAM 38

RETURN OF THE LOW DOUBLES SERVE
THEORY

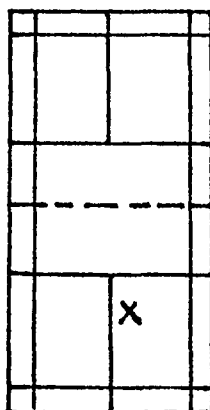
Object

The student must be able to understand both the correct ready position and the types of returns used by answering the criteria test frames correctly.

1. The object in doubles is to get the attack right away by making your opponents hit UP so that you can hit DOWN.

2. In order to get the attack right away you have to meet a good low service before it has a chance to descend in front of the short service line. This means that many of your returns will be met at chest level and dropped over the net or pushed back.

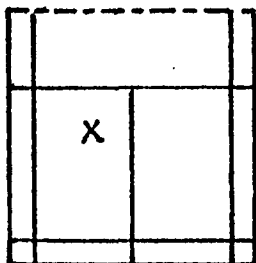
- (a) get the attack right away
- (b) In front of the short service line.
3. The object in receiving the serve is to (a) _____ . From what place should the receiver contact the shuttle?



4. When receiving in the right court stand approximately 3 feet from the short service line and 2 feet from the center line.

Take this position and practice stepping forward and back pedaling.

PROGRAM 38 (continued)

RETURN OF THE LOW DOUBLES SERVE
THEORY

5. When receiving from the left court stand 3 feet from the short service line and 3 feet from the center line.

Take this position and practice stepping forward and back pedaling.

6. Frames 8 and 9 tell you the average distance a person stands from the short service line but this will vary depending upon your reflexes, agility, and stroking ability. Remember your opponent may hit it over your head!

(a) 3 feet or according to your abilities

7. How far should you stand from the short service line?
(a) _____

8. The grip you should use is the "flat" or Western grip. Your racket head should be at net tape level.

9. To get the attack you must be ready. Your left foot will be ahead of your right and your left knee slightly bent. Your left foot will be holding your weight but your right foot is the one ready to start your body forward. This diagonal stance will help you "back pedal" to get a high serve if this should occur.

PROGRAM 38 (continued)

RETURN OF THE LOW DOUBLES SERVE
THEORY

- (a) Left
(b) Left
(c) Right

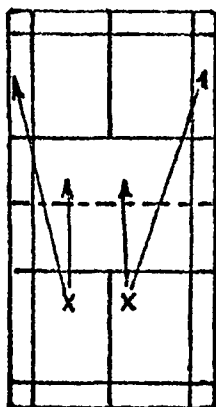
10. In the ready position which foot is forward? (a) _____

Which foot holds the body weight? (b) _____

Which foot starts the body moving forward? (c) _____

- (a) Right

11. Which foot pushes you towards the net? (a) _____



12. As mentioned before most of the low services will be returned with a close drop shot or a push shot down the nearest side line. These shots lessen the angle of return whereas crosscourt shots widen the angle of return.

CRITERIA TEST FRAME 38

(Completion and Picture)

- (a) Drop shot
(b) Push shot down the side line

What are the 2 shots you must perfect for low doubles returns?

- (a) _____
(b) _____

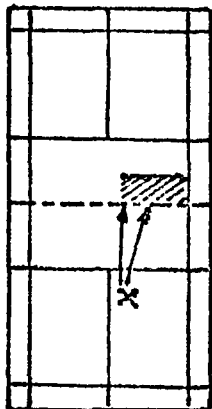
Draw a doubles court and their placement on your answer sheet.

PROGRAM 39 (Requires Court Space)

RETURN OF LOW DOUBLES SERVE (PRACTICAL)

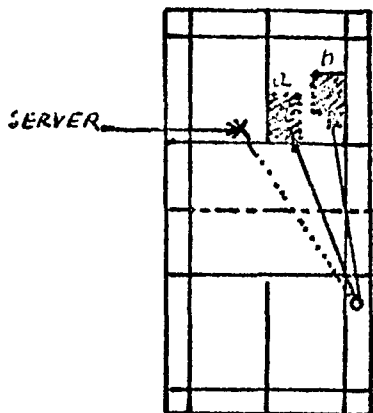
Object

The student must successfully return 5 out of 10 short doubles serves in the form of a drop shot, push shot, cross-court to the server, or a straight drive to the back corner.



1. If you are unable to rush a low doubles serve drop it back over the net so that your opponent will have to hit it up.

2. Have your partner hit you low services and you practice the above frame. Try to be successful by hitting 3 in a row. Practice until you can hit 3 in a row but attempt no more than 5 trials. Use the green target area.

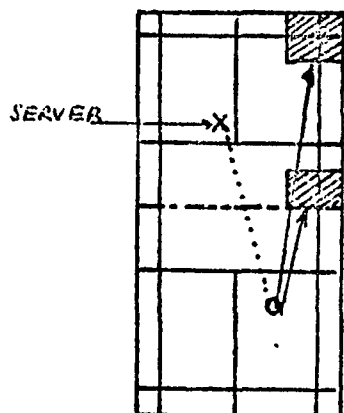


3. If the low serve is to your outside alley use a (a) push shot cross-court straight into the server as he moves to cover his serve
or
(b) use a push-shot half-court past the server but in front of his partner.

PROGRAM 39 (continued)

RETURN OF LOW DOUBLES SERVE (PRACTICAL)

4. Have your partner hit you low services to your outside alley and you practice the above frame. Try to be successful by hitting 3 in a row. Practice until you can hit 3 in a row but attempt no more than 5 trials. Use the green target areas.



5. Another good return is a straight drive down the line into the box in the back corner or a drop shot away from the server.

6. Have your partner hit you low services and you practice the above frame. Try to be successful by hitting 3 in a row to the green target area. Practice until you can hit 3 in a row but attempt no more than 5 trials. Use the green target areas.

PROGRAM 39 (continued)

RETURN OF LOW DOUBLES SERVE (PRACTICAL)

CRITERIA TEST FRAME 39

TASK

(__ out of 10)

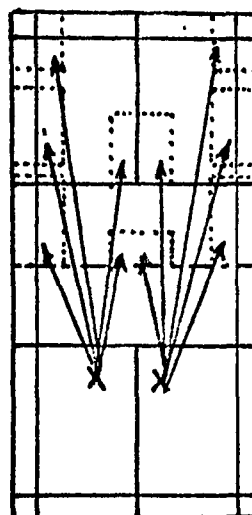
Right and Left Courts

Set up targets as you see them in this diagram; they are merely areas to aim for and to be conscious of.

Have your partner alternately hit you 10 short services which you are to return in the form of a drop shot, push shot, cross-court straight into the server, or a straight drive to the box in the corner. Try to get 5 out of 10. If you are unsuccessful, try again, but no more than 3 times.

Follow the sequence in this diagram, first from the right court and then from the left court.

Record your scores on your answer sheet.



PROGRAM 40 (Requires Court Space)

RETURN OF LOW-DOUBLES SERVE
EXECUTION OF THE PUSH SHOT

Objective

The student must be able to execute 5 out of 10 push shots from his ready position to the green target areas.

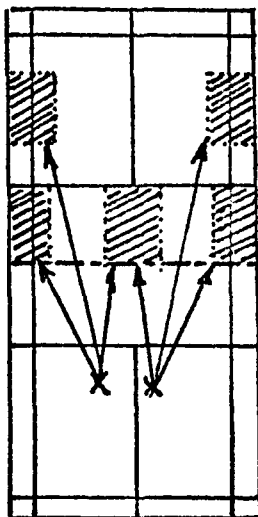
1. The push shot is very effective in receiving a low doubles serve and in playing the up and back position.
-
2. Step forward from ready position with your right foot (same foot as your racket hand) and then push the shot down with a medium amount of speed to the opponent's mid court alley or just over the net. The return shot will usually be UP

CRITERIA TEST FRAME 40

TASK

(_ out of 10)

Right and Left Courts



Have your partner serve you low doubles serves that are "too high" and push them back over the net and down the side line midcourt. Try to get 5 out of 10 in the green target area from both the right and left courts. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.

PROGRAM 41 (Requires Court Space)

RETURN OF LOW SINGLES SERVE

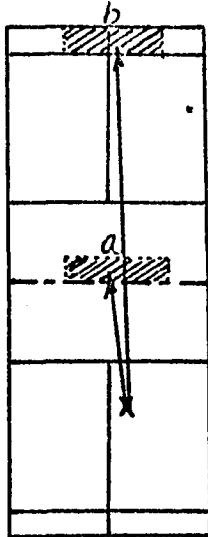
Objective

The student must be able to return 5 out of 10 low services successfully by executing either a drop shot or a flick clear.

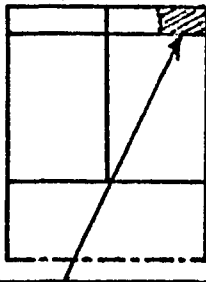
-
1. Remember that you are always trying to put pressure on your opponent when he is serving and this can best be done by meeting his low serve as soon as possible.

(a) As soon as possible

2. Your objective is to meet the low service (a) _____.



3. There are 2 shots you will learn to rely on and to perfect when your opponent hits you a low service in singles. They are:
 - a. a straight drop shot close to the net
 - b. a flick clear in a straight line. This is especially good if your opponent starts to move toward the net to cover it.



4. If your opponent has a well-placed low singles serve, return it with a deep underhand clear, preferably to his backhand corner.
-

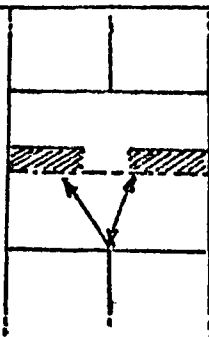
PROGRAM 41 (continued)

RETURN OF LOW SINGLES SERVE

-
5. As soon as your opponent hits you a low singles serve, get to it quickly and "hold" your wrist in a cocked position hoping your opponent will move to the net for a drop shot. At the last possible moment uncock your wrist for a flick clear to the corner.
-

(a) hold

6. Your objective is to get to the shuttle early but (a) your shot.
-



7. Another return is the drop shot from the same "holding" action. Keep your wrist cocked and then with power executed from your forearm, "tap" it over the net. This can either be cross court or straight ahead.
-

PROGRAM 41 (continued)
RETURN OF LOW SINGLES SERVE

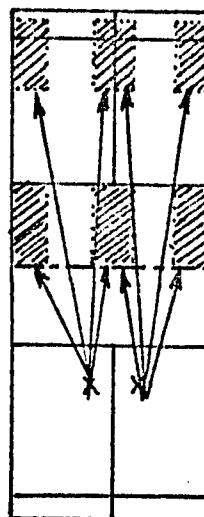
CRITERIA TEST FRAME 41

TASK

(__ out of 10)

Right and Left Courts

Your partner will serve you all short-low singles serves. Use either the drop shot or the flick clear for your return. Try to get 5 out of 10 from each court. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



PROGRAM 42 (Requires Court Space)

THE LONG SINGLES SERVICE

Objective

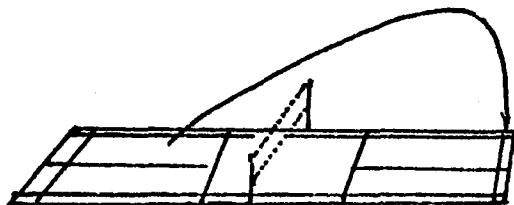
The student must be able to execute 5 out of 10 long singles services in the green target area in both the right and left service courts.

1. You are doing the underhand exercise against the wall for the purpose of strengthening your wrist and forearm. To develop a successful high service will take much strength and power to get the necessary height (at least 20 feet) and depth.

2. You are now going to try to develop a good high singles service. Your objective is to make your opponent hit such a weak return that he will be on the defensive and you will then gain the attack.

3. Your serve should be hit high enough so that it will clear your opponent's reach with his racket extended.

4. When the shuttle leaves your racket it should make a trajectory high over the opponent's court (at least 20 feet) high to the back court where it will lose its speed, turn, and fall straight down (perpendicular) to the floor as close to the baseline as possible. This is a distance of 22' from your opponent's side of the net to his baseline.

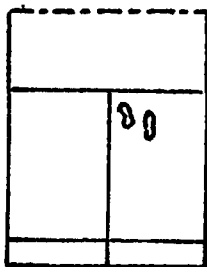


PROGRAM 42 (continued)

THE LONG SINGLES SERVICE

5. To return a shuttle that is falling straight down, your opponent must get to and station himself far back in the court to return it. A weak serve will either be too flat or too low and the opponent will be in a position to intercept it before it even gets to the back court.
-

6. Your best starting position is about 3-4 feet back of the short service line with your left foot forward. Your stance must be erect but comfortable with your feet 12-13 inches apart and most of your weight on the back foot. Because of this starting position, your left shoulder should point towards your opponent.
-



7. As in the short serve, your left foot is forward with toes toward the net and right foot back with toes pointing diagonally toward the side line.
-

8. For the long singles serve you must have a longer backswing and greater wrist cock to give the power you need to clear the shuttle to the back line. You will also learn to use your body and arm to whip the racket head forward so that the strings explode against the shuttle.
-

PROGRAM 42 (continued)

THE LONG SINGLES SERVICE

9. To begin with, hold your racket about waist high behind you with the wrist cocked. The shuttle must be held at the base about shoulder height so it can be dropped well ahead of and slightly to the right of the body.

10. As the shuttle is dropped the racket is swung simultaneously down from its cocked back position to a forward position. The weight transfer is from the right foot to left and the body will rotate left so that it faces the direction of the shuttle's flight at contact point.

11. Contact point will be well ahead of the body and between knee and waist level because of the upward trajectory. The uncocked wrist will be straight at contact point but the forearm and wrist will rotate inward rapidly after contact. Think of hitting UP AND OUT.

12. Remember that the feet must be planted at the start of the serve and the feet have to be kept on the floor until the shuttle is contacted.

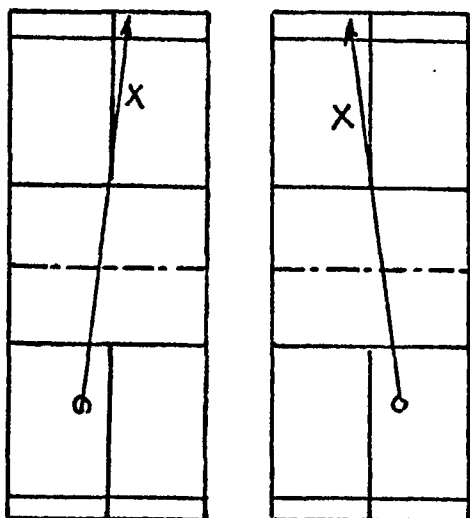
PROGRAM 42 (continued)

THE LONG SINGLES SERVICE

13. After contact your racket will continue vigorously forward towards the net and still upward ending up high over the left shoulder. At this point the wrist is completely uncocked.

Your body weight will be balanced on the ball of the front foot and the toe of the rear foot will still be in contact with the floor. Otherwise you will have committed a foot fault.

14. At this point you should step across the center line so you are straddling it. This is your important BASE and you should attempt to return to it after each of your returns.



15. And where should you be aiming on your long singles serves?

From the right hand court you should aim for the receiver's backhand side.

From the left hand court aim deep to your opponent's forehand. You may be presenting him with a forehand smash but you are still limiting his angle of return and thus you can cover it easier.

PROGRAM 42 (continued)

THE LONG SINGLES SERVICE

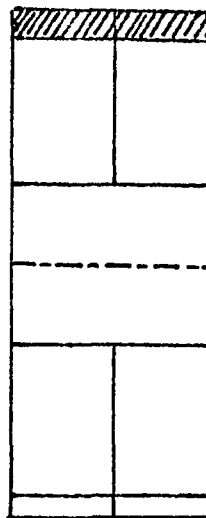
CRITERIA TEST FRAME 42

TASK

(__ out of 10)

Right and Left Courts

Attempt to serve 5 out of 10 long singles serves in the green target area for both the right and left service courts. If you are unsuccessful, repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



PROGRAM 43 (Requires Court Space)

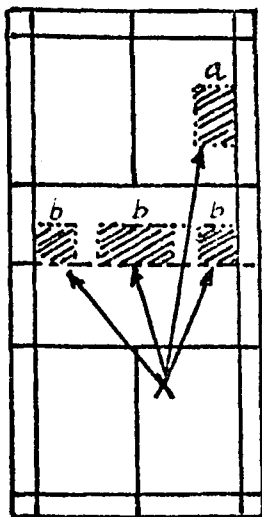
RETURN OF LONG, HIGH
SINGLES SERVE

Objective

The student must be able to return 5 out of 10 high singles services with either a clear, smash, drop shot, or attacking clear into the green target areas.

1. On a long high singles serve you will usually do the following returns:
 - a. Return one with good length and depth down the line.
 - b. Smash one of poor length.
 - c. Vary these two returns with drop shots to keep your opponent guessing.

2. If your opponent has no trouble returning your smashes it is best to try some other tactic so you do not wear yourself out.

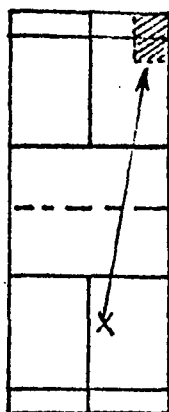


3. If your opponent gives you a long service that is short of the $2\frac{1}{2}$ foot doubles service line, try the following returns:
 - (a) smash
 - (b) cross-court or straight drop shot

Practice 10 of each in a row with your partner setting up all high long services to you that are short of the $2\frac{1}{2}$ foot line.

Use the green targets.

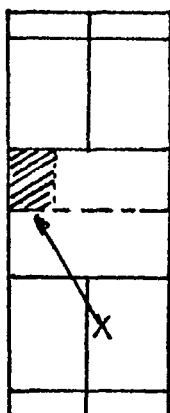
PROGRAM 43 (continued)

RETURN OF LONG, HIGH
SINGLES SERVE

4. Return a good long singles serve with a down-the-line clear. Do not cross court unless your opponent has an extremely weak backhand.

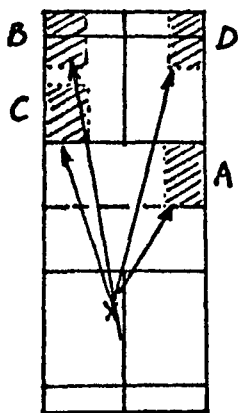
Practice hitting 10 clears down the line with your partner setting up services to you.

Use the green targets.



5. From the right hand court try a forehand sliced cross-court fast drop.

Practice a number of these until you feel confident of the stroke.



6. From the left service court, experiment with the following shots ten times each.

- a. the round-the-head cross-court quick drop shot
- b. a fast clear straight ahead to his forehand
- c. round-the-head smash straight ahead
- d. cross-court clear to his backhand--use sparingly.

PROGRAM 43 (continued)

RETURN OF LONG, HIGH
SINGLES SERVE

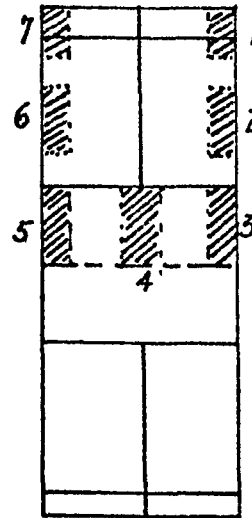
CRITERIA TEST FRAME 43

TASK

(__ out of 10)

Right and Left Courts

Use green target areas and set them up as in the diagram below. Your partner will serve you all high-long singles serves. Use either a clear, smash, drop shot, or attacking clear for your return. Try to get a score of 5 out of 10 following the sequence in the diagram. Practice from both the right and left courts reversing the sequence of the diagram. If you are unsuccessful, repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



PROGRAM 44 (Requires Court Space)

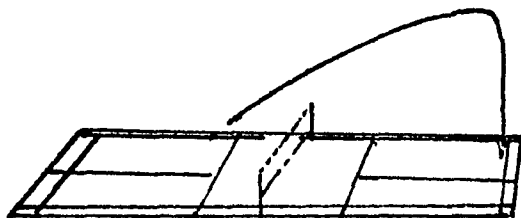
THE LONG DOUBLES SERVE

Objective

The student must be able to serve 5 out of 10 long doubles serves into the green target area for both the right and left service courts.

1. There is still another serve that you can add to your doubles game. You may choose to use it because your own team has a better defense than an attack or the defense is weak with overhead strokes or your other types of service have been ineffective.

- | | |
|--|--|
| <ol style="list-style-type: none"> (a) You're better defend-
ing than attacking (b) Defense has weak over-
head shots (c) Your other services are
ineffective | <ol style="list-style-type: none"> 2. What are 3 reasons you would
choose to serve high in
doubles?
(a) _____
(b) _____
(c) _____ |
|--|--|



3. From the same starting position as the low doubles serve, the trajectory of the high doubles serve should go over your opponent's head, drop straight down, and land just within the back boundary line of his service court.

4. You have the same backswing as your low doubles serve. But at the moment of impact bring your wrist through to speed up the racket swing to direct the shuttle high and deep to the back of the doubles service court.

PROGRAM 44 (continued)

THE LONG DOUBLES SERVE

(a) The same

5. Is your backswing the same or different from the other doubles services? (a) _____

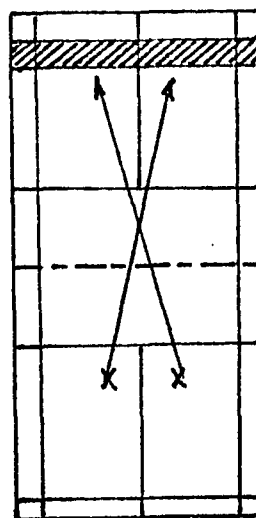
CRITERIA TEST FRAME 44

TASK

(__ out of 10)

Right and Left Courts

Use green targets for your target area and have your partner stand in his ready position with his racket extended. Attempt to get 5 out of 10 in the green target area for both the right and left service courts. If you are unsuccessful, repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



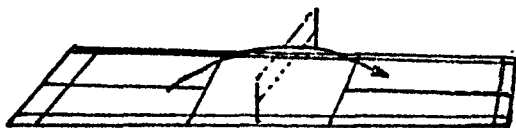
PROGRAM 45 (Requires Court Space)

DOUBLES PLAY
THE DRIVE SERVICE EXECUTION

Objective

The student must be able to serve 5 out of 10 drive services to the green target areas of his opponent's court from the farthest front corner of his own service court.

1. Another serve to add to your repertoire in doubles play is the drive serve. If perfected it is a good way to get a fast needed point but it cannot be over used or it will lose its effectiveness.



2. The trajectory of this shuttle is low and flat and your purpose is either to pass your opponent and make him hit the shuttle poorly or error on his return.

(a) Low and Flat

3. What is the trajectory of the drive serve like? (a)

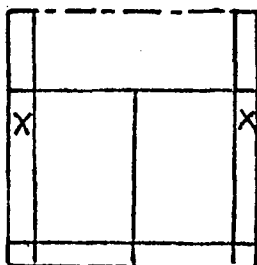
4. To get a poor return from your opponent or against a person with slow reaction time, teach yourself to aim at your opponent's left shoulder or directly at his face, hopefully to make him get off balance and give you the attack.

If he has a good round-the-head smash, stay away from serving to his backhand.

(a) Left shoulder or at his face.

5. Where should you aim on the drive serve? (a)

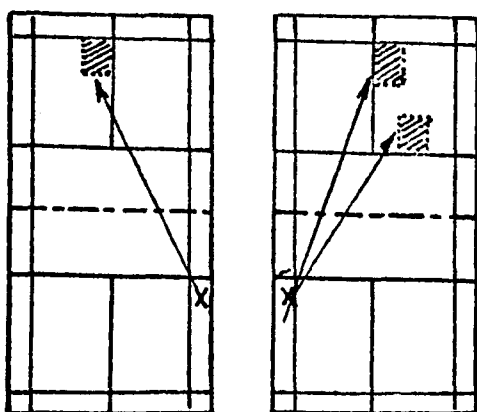
PROGRAM 45 (continued)

DOUBLES PLAY
THE DRIVE SERVICE EXECUTION

6. Your stance for delivery is near the OUTER BORDER of either court. It is a hard hit shot as close to a sidearm delivery as possible but within the legal limits of the service rules.

7. Your preliminary motion and backswing are the same as your other services. Contact is made with a fast rotation of the forearm and wrist in a flat arc. Shuttle contact is made in front of and slightly to the right of the body.

8. As you experiment with this serve you will find that the higher the point of contact, the flatter the arc can be but the contact point must be below waist level and the racket head must be below the level of the hand at the point of contact.



9. As far as placement in your opponent's court goes, try the following:

In the right court:
A quick hit into the deep backhand corner.

In the left court:
A hit deep into the forehand court or directly at the receiver's right face or chest.
Practice these.

PROGRAM 45 (continued)
 DOUBLES PLAY
 THE DRIVE SERVICE EXECUTION

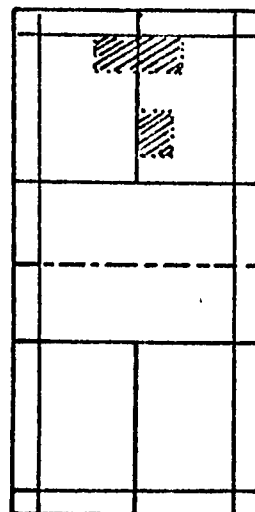
CRITERIA TEST FRAME 45

TASK

(_ out of 10)

Right and Left Courts

Have your partner stand in ready position to receive a doubles serve. Attempt to serve 5 out of 10 from your own right hand court into the deep backhand corner of his right service court. From your left service court serve 5 out of 10 to his forehand court or right at him. Use the green target areas. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



PROGRAM 46 (Requires Court Space)

THE FLICK DOUBLES SERVE
EXECUTION

Objective

The student must be able to serve 5 out of 10 flick doubles serves into the green target areas of the right and left service courts.

1. In your serving tactics you may want to introduce the element of surprise. A flick serve is especially useful against someone who continually stands close to the short service line and rushes your low service or is having no trouble returning your low serve.
-

(a) Flick serve

2. What serve can you use against someone who continually rushes your short service? (a) _____
-

3. You may want to develop a serve that is somewhere between the short serve and the high one. This serve passes over your opponent's racket but not too high so that he has time to prepare for a shot. It can either be beyond his reach or driven past him at head level.

The purpose of a flick serve is to catch him in an off-balance position or an awkward one so that he will end up giving you a poor return.

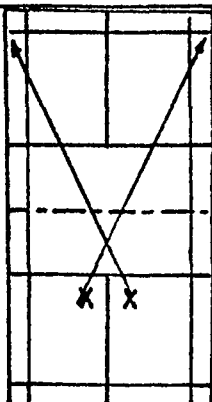
PROGRAM 46 (continued)

THE FLICK DOUBLES SERVE
EXECUTION

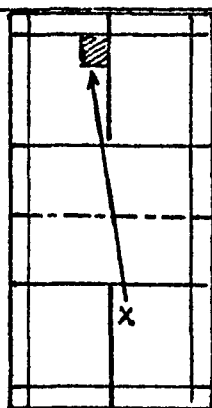
- (a) To catch him off
balance.
(b) short
(c) long

4. What is the purpose of a flick serve? (a) _____
The flight of a flick serve is longer than a (b) _____ serve but lower than a (c) _____ serve.

5. A good flick service travels quickly and will land 6" from the back service line.



6. Your best direction is to the farthest corner (in the tram-lines) of the service court because of the shuttle having more of a chance to go beyond your opponent's reach. It also gives you time to get set for his return.



7. When serving from right court to right court a good flick serve is to your opponent's inside next to the center service line. This is his backhand side which may be weak.

PROGRAM 46 (continued)

THE FLICK DOUBLES SERVE
EXECUTION

-
- (a) fast
(b) outside
(c) backhand
8. Complete the following statements:
- A good flick service travels (a) _____.
- Your best flick serve should be to the (b) _____ corner.
- A good flick serve from right court to right court is to the inside next to the center line because of your opponent's (c) _____.
-
9. The preparation for this service is the same as your low service.
- Your serving arm comes forward with the same speed as your other serves. The speed of the flick serve is done at the last moment at contact point with the uncocking of the wrist and forearm rotation.
-
- (a) Same preparation
(b) At contact point
10. What does this serve have in common with the other serves?
(a) _____
- When is speed imparted to the shuttle? (b) _____
-

PROGRAM 46 (continued)

The FLICK DOUBLES SERVE
EXECUTION

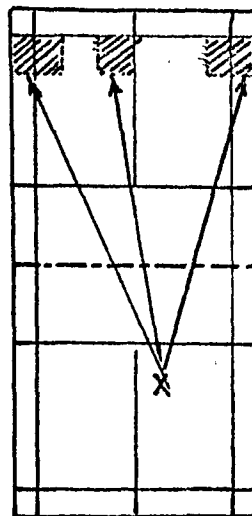
CRITERIA TEST FRAME 46

TASK

(__ out of 10)

Right and Left Courts

Have your partner stand in ready position for a doubles serve. Attempt to get 5 out of 10 flick services into the green target areas in the forehand court (right) of your opponent and 5 out of 10 into the green target area of the left service court. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.

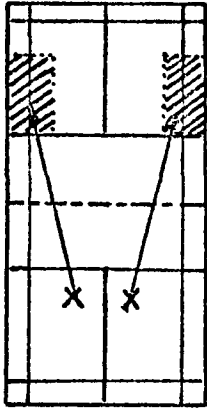


PROGRAM 47 (Requires Court Space)

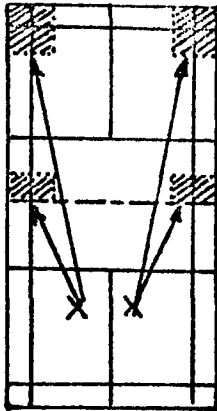
RETURN OF FLICK SERVE
SINGLES AND DOUBLES

Objective

The student must be able to return 5 out of 10 flick services with a smash, clear, or drop shot into the green target areas from both the right and left service courts.



1. If the flick serve given to you is low enough so that you can intercept it, smash your return to either side line.



2. If it is deep use your clear or drop shot.
-

PROGRAM 47 (continued)

RETURN OF FLICK SERVE
SINGLES AND DOUBLES

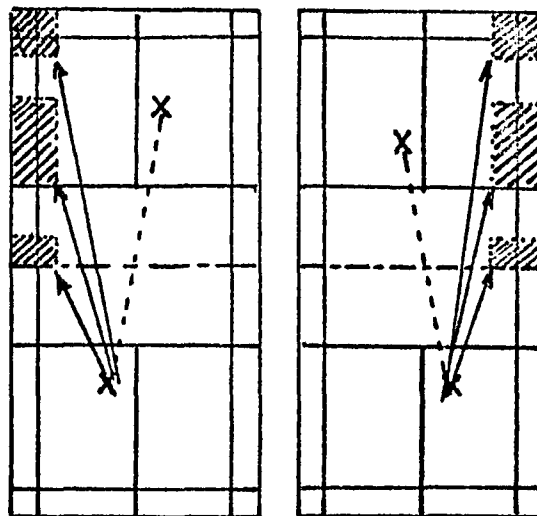
CRITERIA TEST FRAME 47

TASK

(__ out of 10)

Right and Left Courts

Have your partner hit you 10 flick services from his right hand court and you attempt to hit 5 out of 10 into the green target areas with a smash, drop, or clear depending on the quality of the service. Do the same exercise from the left court. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.

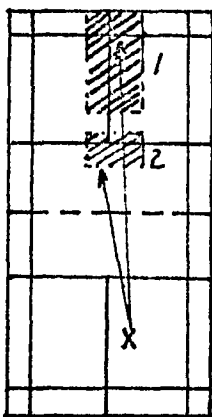


PROGRAM 48 (Requires Court Space)

DOUBLES
RETURN OF HIGH DOUBLES, FLICKS, AND
DRIVE SERVICES

Objective

The student must be able to successfully return 5 out of 10 high doubles serves, flick serves, and drive services with the appropriate returns as requested in the criteria test frames.



1. If your opponent gives you a high service, smash it straight ahead (Green target area 1) If you are off balance, return it with a fast drop shot straight ahead. (Green target area 2).

CRITERIA TEST FRAME 48A

TASK

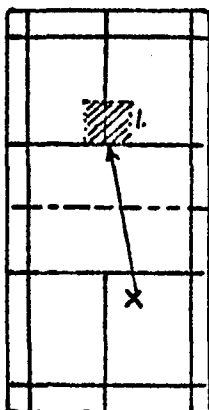
(__ out of 10)

Right and Left Courts

Have your partner hit you 10 medium high services and you practice the above frame. Try to be successful by hitting 5 out of 10. If you are unsuccessful, repeat the exercise but no more than 3 times. (Alternate the two types of returns). Practice from both the right and left courts. Record your scores on your answer sheet.

PROGRAM 48 (continued)

DOUBLES
RETURN OF HIGH DOUBLES, FLICKS, AND
DRIVE SERVICES



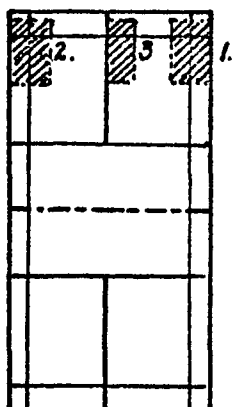
2. If your opponent gives you a flick service, hit a half-court (half-speed) smash straight ahead (Green target area 1). If you need to backpedal closer than 6 feet to the back doubles service line to return a flick service, you can anticipate that the service will probably be out.

CRITERIA TEST FRAME 48B

TASK

(__ out of 10)
Right and Left Courts

Have your partner hit you flick services and you practice the above frame. Attempt to get 5 out of 10. If you are unsuccessful repeat the exercise but no more than 3 times in a row. Practice this from both the right and left courts. Record your scores on your answer sheet.



3. Another return of a high service is to drive it to the backhand of the server's partner (Green target area 1), and sometimes to his forehand alley (Green target area 2), or hit it right at him so he will hit a weak return (Green target area 3).

PROGRAM 48 (continued)

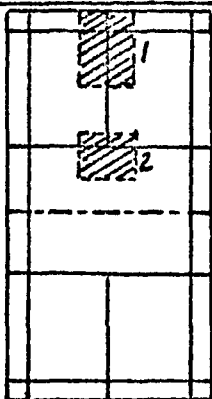
DOUBLES
RETURN OF HIGH DOUBLES, FLICKS, AND
DRIVE SERVICES

CRITERIA TEST FRAME 48C

TASK

(__ out of 10)

Have your partner hit you medium high services and you practice the above frame by trying to get 5 out of 10 in alternating the different types of returns. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on your answer sheet.



4. If your opponent should give you a drive serve, smash it back at the server (Green target area 1) or block it quickly over the net toward the middle of the court (Green target area 2).

CRITERIA TEST FRAME 48D

TASK

(__ out of 10)

Right and Left Courts

Have your partner hit you drive services and try to be successful with your returns with 5 out of 10. Alternate your returns. If you are unsuccessful repeat the exercise but no more than 3 times. Use both the right and left courts and record your scores on your answer sheet.

PROGRAM 49 (Requires Court Space)

RETURN OF SERVICE
CONVERTING A DEFENSIVE SERVE INTO AN ATTACK

Objective

The student must show that he understands the basic strategy of the return of service by converting both high and low services into attacking returns successfully 5 out of 10 times.

-
1. When receiving the service your objective is to hit the defensive serve which has been hit UPWARDS to you--DOWNWARDS so that you gain the offensive. (attack)

(a) The attack

2. When you return the serve what are you trying to gain?
(a) _____

-
3. As you gain experience you will learn to anticipate but anticipating too much may lead you into trouble at times. Do not move from your ready position UNTIL the shuttle has been STRUCK by the server.

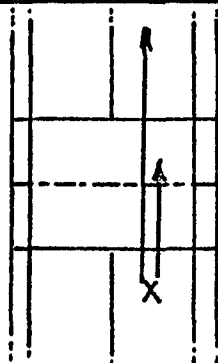
(a) When the shuttle has been struck.

4. When should you move from your ready position? (a) _____

-
5. Teach and make yourself meet all serves ABOVE waist level and higher if possible. Remember that the server is hitting from BELOW waist level which should give you the attack right away if you are alert enough.
-

PROGRAM 49 (continued)

RETURN OF SERVICE
CONVERTING A DEFENSIVE SERVE INTO AN ATTACK



6. There are certain options you can use in returning services. Use net shots or drives (push shots) against low services and smashes, drop shots, or clears against the flick or high services. Hit these returns down-the-line.

- (a) Net shots or drives
(push shots)
down-the-line

7. What kind of returns can you do against low services?
(a) _____

- (a) Smashes
(b) Drop shots
(c) Clears
(d) Hit down-the-line

8. What are the options against the flick or high services?
(a) _____
(b) _____
(c) _____
(d) _____

CRITERIA TEST FRAME 49

TASK

(__ out of 10)

High and Low Serves

Have your partner hit you 10 low services and 10 high services for which you will try to convert 5 out of 10 of each kind down-the-line into a successful attack. Do not use targets. Mentally picture what kind of return you will use and then attempt to be successful with that return. If you are unsuccessful, repeat the exercise but no more than 3 times each. Record your scores on your answer sheet.

PROGRAM 50

FUNDAMENTALS OF STROKING
STROKES EXECUTED FROM A HIGH CONTACT POINT

Objective

The student must be able to name the 3 strokes that can be executed from a high contact point in the criteria test frame.

1. There are three effective strokes that you can quickly hit from a high point. Each has the same preparatory backswing. They are the SMASH, CLEAR, and DROP SHOT.
-

CRITERIA TEST FRAME 50

(Completion)

- (a) Smash
- (b) Clear
- (c) Drop shot

What are the three strokes you can hit quickly from a high point, each with the same backswing. Record on your answer sheet.

(a)(b)(c)

PROGRAM 51

THE OVERHEAD CLEAR
 FLIGHT PATTERNS OF THE OFFENSIVE AND DEFENSIVE CLEARS

Objective

The student must be able to show (draw) the flight patterns of a good offensive and defensive clear.

1. The overhead clear can be either an offensive or a defensive high shot to the back of the court.
-

(a) high

2. Pick one of the following answers:

The overhead clear is a
 (a) high (b) low shot in the
 back of the court.

Fill in the missing words:

(a) offensive
 (b) defensive

The overhead clear can be
 either (a) _____ or (b) _____.

3. Here are the reasons you want to develop a good defensive clear: it is probably the most important of the shots in badminton.

(a) When you want to gain time for better positioning on the court.

(b) To lessen the effectiveness of your opponent's return because of his deep position in the backcourt.

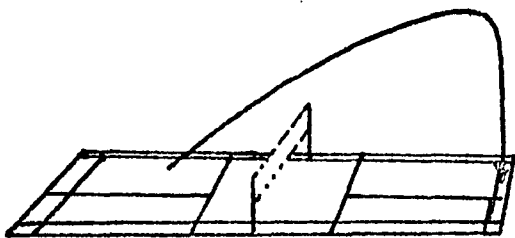
(c) When it is the best or most effective stroke you can use at that time.

(d) When you are rallying (deep clears) and hoping for a weak return.

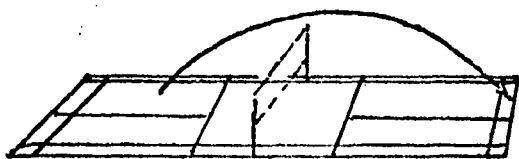
PROGRAM 51 (continued)

THE OVERHEAD CLEAR
 FLIGHT PATTERNS OF THE OFFENSIVE AND DEFENSIVE CLEARS

4. Most of the time you will use the defensive clear to force your opponent as far to the backcourt as possible. In order to do this you must have much depth and height in your shot. See the diagram to the left.



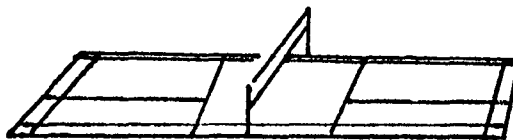
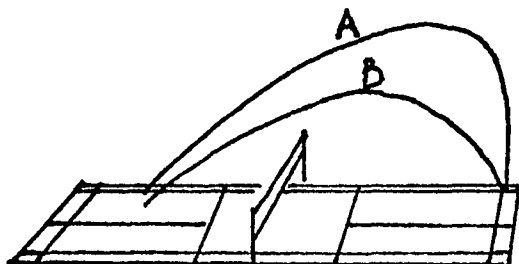
5. You will use the attacking clear to keep constant pressure on your opponent. Notice its difference in flight pattern from the defensive clear.



CRITERIA TEST FRAME 51

(Picture)

Draw the flight pattern of an offensive and defensive clear on your answer sheet. Let A represent the defensive clear and B the attacking clear.

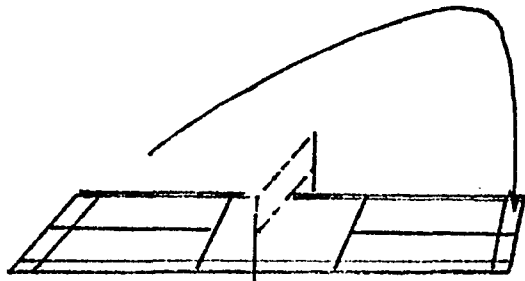


PROGRAM 52

THE OVERHEAD CLEAR
ITS EFFECTIVENESS

Objective

The student should know the value of being able to hit a vertically dropping shuttle by supplying the missing answers in the criteria frame.



1. You must practice your overhead clears so that they are very deep and fall perpendicularly to the baseline. This is a most difficult shot for your opponent to play because a shuttle falling straight down is difficult to time and has no speed that can be converted for his return shot.

CRITERIA TEST FRAME 52

(Completion)

- (a) time
- (b) speed

Supply the missing words in the following statement:

A shuttle falling perpendicularly to the floor is most difficult to play because it is difficult to (a) _____ and has no (b) _____ that can be converted for the return shot.

PROGRAM 53

THE OVERHEAD CLEAR
WRIST SNAP

Objective

The student must consistently be able to make a "swishing" sound with the racket head on the forward swing for both the forehand and backhand clears 5 times in a row.

1. The wrist does not start to "uncock" until the last moment before contact. This makes the whistling sound on a well hit shot.

The crucial part of the swing is at the moment of impact. At this point the forearm and wrist are rotating as contact is made.

2. Good contact point is in front of the player. The best place for you is behind and in line with the shuttle.

Do not allow overheads to drop low or to the side but teach yourself to take them ahead and at the earliest point of contact.

CRITERIA TEST FRAME 53

TASK

(__ times in a row)

Forehand and Backhand

With your partner listening, attempt to make a swishing sound with your racket head from an overhead position for both forehand and backhand 5 times in a row. If you are unsuccessful, repeat the exercise but no more than 3 times in a row each. Record on your answer sheet.

PROGRAM 54
THE OVERHEAD CLEAR
WEIGHT SHIFT

Objective

The student must be able to execute the proper weight shift on the overhead clear from the back foot to the front foot with the proper stroke when swinging at a basketball net or a suspended shuttle 10 times in a row.

1. Your left foot is advanced and your weight is on your right foot. Your body is at right angles to the net. Extend the non-racket arm toward the suspended shuttle or basketball net.

2. Swing the racket and arm behind the head and shoulder, wrist cocked. Your racket head will be down and your right hand will be close to the right ear. This action will make you pivot at the waist and turn the shoulders sideways to the net.

3. Your upper arm is parallel to the floor on the backswing and the racket head is almost touching your backbone and your elbow is sharply bent. From here you must swing upward.

4. From this point your wrist leads the movement. Straighten your elbow and arm upward towards the spot where you want to hit the shuttle. Keep your wrist back. Your weight is transferred from your rear foot to the front foot.

PROGRAM 54 (continued)

THE OVERHEAD CLEAR
WEIGHT-SHIFT

5. As the elbow straightens and just before the bird is hit at a point slightly behind the right shoulder, the wrist is uncocked, giving additional power to the stroke. The action of your elbow and wrist should straighten your arm and racket just as you hit the bird.
-

6. Your legs and body uncoil to add great strength to the over-all forward thrust toward the shuttle.

You are actually throwing the racket head at the shuttle.
(In this case the basketball net or suspended shuttle)

7. The weight transfer from the right to the left foot will rotate your upper body. This will pull your right shoulder around and the right foot forward. As a result you are facing the target area as the stroke is made.
-

8. Now practice the entire swing with a loose, relaxed action. As the mechanics become smooth and feel good to you, gradually increase the speed of the swing.
-

PROGRAM 54 (continued)

THE OVERHEAD CLEAR
WEIGHT SHIFT

CRITERIA TEST FRAME 54

TASK

(times in a row)

Extend your arm towards the net of the basket and measure your contact distance to the net. Take a full backswing while your weight shifts backward and then throw the head of the racket at the net as your weight shifts forward. Follow-through on the left side of your body.

Attempt to hit the net or suspended shuttle 10 times in a row. Each attempt must show a definite weight shift and stretch of your whole body when contacting the net. If you are unsuccessful, repeat the exercise but no more than 3 times.

Record on your answer sheet.

PROGRAM 55 (Requires Court Space)

THE OVERHEAD CLEAR
SETTING THE SHUTTLE UP TO YOURSELF

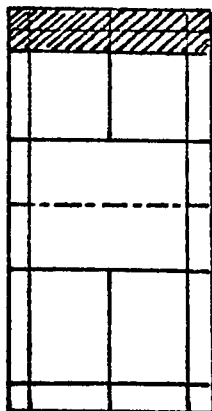
Objective

The student should be able to set the shuttle up to himself from the deep doubles service line for overhead clear practice on both the forehand and backhand sides and be able to get 5 out of 10 in the green target area.

1. To see how high you need to toss the shuttle, stand on your toes with your feet together and straighten your arms with racket extended and reach as high as you can above your head. Make sure that there is a straight line from your feet to the tip of your racket. This is the proper height for the shuttle toss.

2. Place the shuttle (sitting on its feathers) on the forehand side of your racket face. Your palm will be facing up.

Your right foot should be on the baseline so that you are standing between the baseline and the deep doubles service line.



3. For your forehand lift the racket straight upward so that your toss is in front of your right shoulder and above head level. Cock the racket head back and clear the shuttle as high and deeply as possible (aiming for the green target area).

Step left as the forward swing is made.

PROGRAM 55 (continued)

THE OVERHEAD CLEAR
SETTING THE SHUTTLE UP TO YOURSELF

-
4. To prepare yourself better for the clear, turn your body towards the right side line so that your feet are perpendicular to the net and your left shoulder is pointing to the net.
-

5. Your direction is determined by a right angles contact to the shuttle to the direction in which you want the shuttle to go.

There must not be any cutting or slicing motion.

A good hit will make a "popping sound" of shuttle against strings.

6. On the backhand set-up to self, hold the shuttle on the forehand side (palm facing up) of your racket but over on the left hand side of your body.
-

PROGRAM 55 (continued)

THE OVERHEAD CLEAR
SETTING THE SHUTTLE UP TO YOURSELF

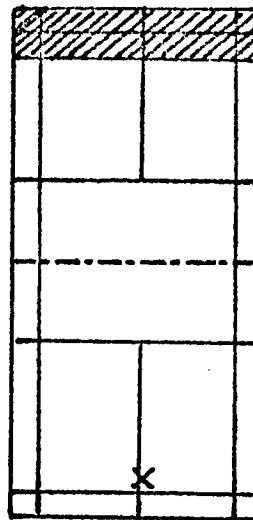
CRITERIA TEST FRAME 55

TASK

(__ times out of 10)

Forehand and Backhand

Start near the short service line and progressively work yourself back to the space in front of the deep doubles service line. When you feel you are ready to try the objective, try to get 5 out of 10 forehands and backhands in the green target area. If you are unsuccessful, repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 56 (Requires Court Space)

THE OVERHEAD CLEAR
HITTING A GOOD DEFENSIVE CLEAR

Objective

The student should be able to move to the place on the court which is in correct relationship to a deeply cleared shuttle and successfully clear 5 out of 10 into the green target area higher than her opponent's extended racket.

1. Remember that a good clear should drop vertically on the opponent's baseline.

A well hit shuttle will go high above the back boundary line, lose its speed, turn, and fall straight down.

2. Thus the shuttle has no speed for your opponent to convert when making his return.

A shuttle falling perpendicular to the floor is the most difficult to play.

3. Shift your weight to the back foot always keeping the shuttle ahead of you. This may require your having to skip backwards behind the flight of the dropping shuttle.
-

4. Train yourself to hit the shuttle as soon as possible so that your opponent will not have time to get to it. This also helps you by cutting down the distance the shuttle has to travel.
-

PROGRAM 56 (continued)

THE OVERHEAD CLEAR
HITTING A GOOD DEFENSIVE CLEAR

(a) soon
(b) time

5. Answer the following questions:

You should learn to hit the shuttle (a).

You do not want to give your opponent (b).

6. If you hit the shuttle soon, you are taking away time from your opponent to recover and it also gives you an opportunity to hit down.

7. You should learn to hit a very HIGH defensive clear because this will give you a longer time to recover from a difficult situation which you may be in.

Remember also that a high shot to your opponent will be difficult for him to time.

(a) To give you time
(b) The timing

8. What is the purpose of hitting a high defensive clear? (a)

What is the difficulty of hitting a high defensive clear? (b)

9. To get the shuttle to go high and deep, swing the racket forward and upward. Your follow-through will simply follow the shuttle and then end waist height on the left side of your body.

PROGRAM 56 (continued)

THE OVERHEAD CLEAR
 HITTING A GOOD DEFENSIVE CLEAR

10. Contact the shuttle as high as possible with an extended arm.

11. The racket face is tilting upward so that the shuttle will rebound at a 90 degree angle or perpendicular to the face of the racket.

12. You are literally throwing a 5 ounce racket against a 1 ounce shuttle which means the contact of the racket and shuttle must be explosive in order to get distance.

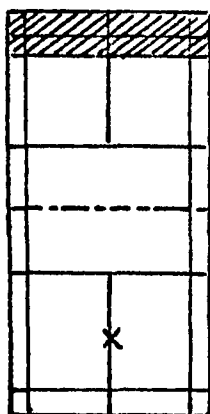
The racket will make a "popping sound" at shuttle contact.

CRITERIA TEST FRAME 56

TASK

(__ out of 10)

Forehand and Backhand



Stand in ready position and have your partner set up underhand high clears to you and then extend her racket high after each one. Attempt to hit high over her head and get 5 out of 10 clears in the target area. If you are unsuccessful, repeat the exercise but no more than 3 times. Record on answer sheet.

PROGRAM 57

THE BACKHAND CLEAR
ANALYSIS

Objective

The student must be able to understand and perform the correct mechanics of the backhand clear by swinging at an overhanging basketball net or suspended shuttle and hitting it with a vertically extended arm 10 times in a row.

1. When learning the backhand clear you must keep in mind that for most players it is the most difficult shot in badminton and it is often the one that your opponent will try to force you to make.

2. It is a high deep shot played on the left side of your body that should clear your opponent's racket and land in the last $2\frac{1}{2}$ feet of the court.

3. Good timing, rotation, and racket head speed will enable you to do this. Your arm and racket should be fully extended when you contact the shuttle.

4. As you move into position you must change your grip to a backhand one with the ball of your thumb flat against the back bevel. This will give you more strength.

(a) Against the back bevel

5. Where should the ball of your thumb be placed? (a) _____
-

PROGRAM 57 (continued)

THE BACKHAND CLEAR
ANALYSIS

6. Turn your body so that your back is facing the net. This will place your right foot a few feet closer to the left side line than the left foot.

- (a) facing
(b) The right

7. Answer the following questions:

Your back is (a) _____ the net.

Which foot will be closer to the left side line? (b) _____

8. At this point your back is bent slightly away from the net which will automatically place your weight on the left or back foot. Your racket is in backswing position with your elbow pointing toward the shuttle and your wrist is cocked. The racket head is pointing toward the floor.

- (a) back
(b) shuttle
(c) floor

9. Answer the following questions:

(a) On the backswing your weight should be on the _____ foot.

(b) Your elbow should be pointing toward the _____.

(c) Your wrist is cocked until your racket head is pointing toward the _____.

PROGRAM 57 (continued)

THE BACKHAND CLEAR
ANALYSIS

-
10. Your arm will uncoil and snap upward towards the shuttle when it is approximately over your right shoulder.

Hit the shuttle at the height of your reach.

11. This will transfer your weight to the right foot. Your hand, shoulder, and arm bring the racket forward and just BEFORE contact, the wrist snaps forward. Your thumb will help control the racket speed here.
-

12. This body position will permit you to snap the racket upward and forward to meet the shuttle. At this contact point, your arm and racket are as high as they can reach. There should be a "popping" sound at contact point.
-

(a) By snapping your wrist

13. How do you get the racket head upward? (a)
-

14. Your follow-through will move along the direction of the shot.
-

15. Be deliberate in your stroking. Do not hurry or cramp your style.
-

PROGRAM 57 (continued)

THE BACKHAND CLEAR
ANALYSIS

CRITERIA TEST FRAME 57

TASK

(__ times in a row)

Stand directly below the basketball net or a suspended shuttle and take the correct body position in relation to the overhanging net. Using the analysis you have just learned, throw the head of the racket at the net and follow-through. Try to attain 10 good swings in a row, showing a definite weight shift and stretch in your whole body when contacting the net or shuttle.

If you are unsuccessful, repeat the exercise but no more than 3 times in a row.

Record on answer sheet.

PROGRAM 58

WRIST AND FOREARM ACTION
OVERHEADS

Objective

The student must be able to make a "swishing" sound of the racket head by using the wrist and forearm correctly in the overhead position 5 times in a row.

CRITERIA TEST FRAME 58

TASK

(__ times in a row)

Show your partner your ability to use forearm rotation and wrist snap by making a "swishing" sound with your racket head 5 times in a row from an overhead position. There should also be a transference of weight from back foot to front foot as the swishing sound is made.

Repeat the trials until you can do 5 swishes in a row but take no more than 3 trials. Record your scores on your answer sheet.

PROGRAM 59

FOREARM ROTATION AND WRIST SNAP
HITTING AGAINST THE WALL

Objective

The student must be able to demonstrate eye-hand coordination and wrist flexibility that will allow for wrist-cocking and wrist-snap forward at the moment of impact. He will show this by hitting the shuttle 5 times against the wall from a distance of at least 10 feet on both the forehand and backhand sides.

CRITERIA TEST FRAME 59

TASK

(__ times in a row)

Forehand and backhand

Hit a rubber-tipped shuttle against the wall a minimum of 5 successive times from a distance of 10 feet (red line) on both the forehand and backhand sides. If you are unsuccessful repeat the exercise but no more than 3 times.

Record each of your trials on your answer sheet.

PROGRAM 60

THE UNDERHAND CLEAR
A DEFENSIVE WEAPON

Objective

The student must be able to understand the purposes of the underhand clear as being defensive by giving the correct answer to the criteria test frame.

-
1. The reason you use an underhand stroke is that it is too late to take the shuttle from an overhead position.
-

2. You will learn to return smashes and drop shots with your underhand clear that fall close to the net.
-

CRITERIA TEST FRAME 60

(Completion)

- (a) Return smashes
- (b) Return drop shots

What are two good purposes for which the underhand clear is used?

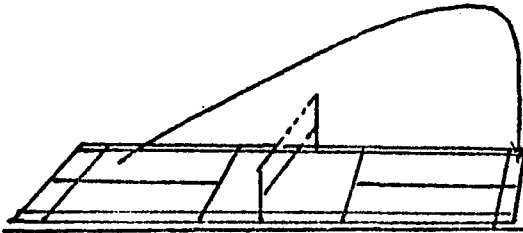
- (a) _____
 - (b) _____
-

PROGRAM 61 (Requires Court Space)

THE UNDERHAND CLEAR
FOREHAND AND BACKHAND

Objective

The student must be able to hit 5 out of 10 shuttles into the green target area on both the forehand and backhand sides.



THE FOREHAND UNDERHAND CLEAR

1. The flight pattern of the shuttle is similar to the high, deep, service.
2. The contact point should be as close to the net as possible.
3. You will start the underhand clear with your racket held back at about shoulder level. Your body will be turned at a right angle to the net with the left foot in front of the right foot.
4. At the start of your swing, your weight will be on the rear foot. The racket is swung downward and to the side of your body--your wrist is leading the racket on the forward swing. Your weight transfers to the forward foot for added power.
- (a) Your wrist
5. What leads the racket on the forward swing? (a)

PROGRAM 61 (continued)

THE UNDERHAND CLEAR
FOREHAND AND BACKHAND

6. Your follow-through will be a natural, full movement up and in the direction in which you hit the shuttle. At this point your weight will be fully transferred to the forward foot.

Your right hand is at chest level and your elbow is bent.

7. BACKHAND UNDERHAND CLEAR
On the backhand you must quickly shift to your backhand grip and bring the racket far back. Your elbow is sharply bent and your right hand will be a little below and in front of your left upperarm.

Your weight is placed on the left or back foot.

8. To get the power necessary for a good backhand underhand clear, your right foot should be placed 2 feet closer to the left sideline than the left foot--right knee slightly bent. This gives your body a coiling and uncoiling action.
-

9. As you prepare to hit the shuttle, bring the racket forward as your body rapidly turns to the right. Your weight will be transferred to the forward foot and the racket head is snapped forward by hand, wrist, and thumb.
-

PROGRAM 61 (continued)

THE UNDERHAND CLEAR
FOREHAND AND BACKHAND

-
10. Follow-through high. At the end your arm is straight and the hand is about head high.
-

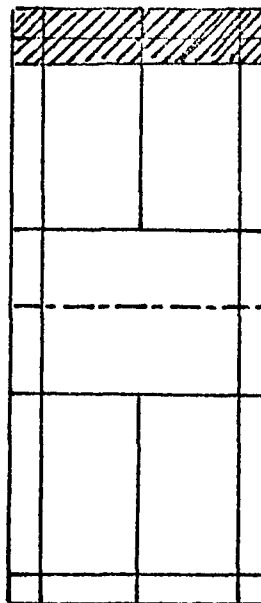
CRITERIA TEST FRAME 61

TASK

(__ out of 10)

Forehand and Backhand

Have your partner set up 10 short serves. Underhand clear the shuttle high and deep to the baseline of the opposite court. Try to hit 5 out of 10 in the green target area on both your forehand and backhand sides. If you are unsuccessful, repeat the exercise but no more than 3 times. Record on answer sheet.



PROGRAM 62 (Requires Court Space)

THE UNDERHAND FLICK CLEAR

Objective

The student must be able to hit 5 out of 10 underhand flicks to the green target area from behind the short service line past the outstretched racket of his opponent.

1. When you have a lack of time in your backswing, use the flick clear. You will learn to hit this with a quick uncocking or snapping of the wrist from an underhand position in an upward and forward direction.

You will hit it between the knees and the chest depending on how quickly you get to the shuttle.

The secret to flicking is to hesitate until the last possible moment.

PROGRAM 62 (continued)

THE UNDERHAND FLICK CLEAR

CRITERIA TEST FRAME 62

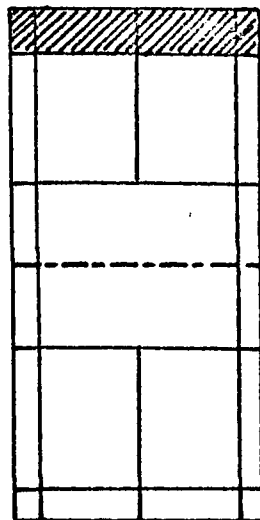
TASK

(__ out of 10)

Forehand and Backhand

With a partner take the following flick exercise: 10 on the forehand side and 10 on the backhand side. Have your partner set up drop shots from his short service line to in front of your short service line and then extend his racket. You are to flick the drop shot past his outstretched racket to as close to his baseline as possible. Try to score 5 out of 10 in the green target area. If you are unsuccessful, repeat the exercise but no more than 3 times.

Record on answer sheet.



PROGRAM 63 (Requires Court Space)

FLICK RETURNS NEAR THE NET

Objective

The student must be able to develop his speed and reaction time to hit down (flick) 5 out of 10 shuttles that are close to and above the net to the green target areas.

1. Train yourself to put away any net shots that you take at tape level or higher to an open spot in your opponent's court.

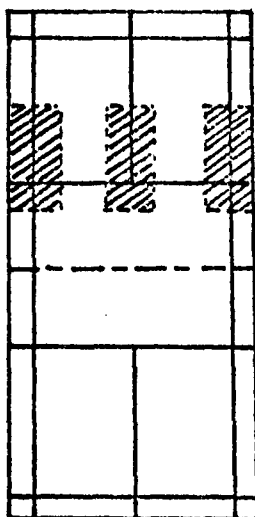
Move in quickly and hit it sharply downward being careful not to hit the net.

Get to the shuttle before it falls.

CRITERIA TEST FRAME 63

TASK

(__ out of 10)



Stand in your ready position at the short service line and have your partner hit 10 underhand net shots that you are able to contact (2 feet) above net level. Move forward quickly with $1\frac{1}{2}$ steps and hit the shots sharply downward to an open space on your opponent's court. Direct your returns to the different areas in the diagram and try to get 5 out of 10 in. If you are unsuccessful repeat the exercise but no more than 3 times. Record your scores on answer sheet.

PROGRAM 64

THE ATTACKING CLEAR
ITS BEST USES

Objective

The student should be able to understand the best use of the offensive clear by giving the correct answer to the criteria test frame.

1. The attacking clear is valuable for your repertoire of strokes in that its use will keep constant pressure on your opponent.
-

2. Here is an example of its best use:

The offensive clear is best used following a good drop shot to the forehand corner. The clear is then quickly hit to the backhand corner while the opponent is recovering from the net.

3. Another use is on short players who are forced to go to the backcourt and have to hit the dropping shuttle about waist high. This will probably be a weak return.
-

4. Also use it on slow players who often let the shuttle get behind them.
-

5. Frequently you can use it on players who purposely protect their backhand side of the court by standing to the left of their center base to protect a weak backhand.
-

PROGRAM 64 (continued)

THE ATTACKING CLEAR
ITS BEST USES

CRITERIA TEST FRAME 64

(Completion)

- (a) dropshot
- (b) forehand
- (c) backhand

Supply the missing words in the following statement:

The offensive clear (attacking) is best used following a good (a) _____ to the (b) _____ corner.

The clear is then quickly hit to the (c) _____ corner while the opponent is recovering from the net.

PROGRAM 65 (Requires Court Space)

THE UNDERHAND ATTACKING CLEAR
THE MECHANICS

Objective

The student must be able to hit forehand and backhand offensive underhand clears 5 out of 10 times to the green target areas from drop shots hit to both his forehand and backhand net corners.

1. Train yourself to use the attacking clear following a good dropshot to the forehand corner. Hit the clear quickly to the backhand corner when your opponent is still recovering from the net.

- (a) attacking clear
- (b) forehand corner
- (c) quickly
- (d) backhand corner

2. Supply the missing words:

You should use the (a) _____ following a good dropshot to the (b) _____. Hit it (c) _____ to the (c) _____.

3. Do you recall the reason you want to get to the shuttle quickly?

The higher and sooner you contact the shuttle from an underhand position the better will be your angle of return and the less time you give your opponent to recover.

4. The drop shot that you are looking for from your opponent is one that would land well out from the net in the vicinity of your short service line.

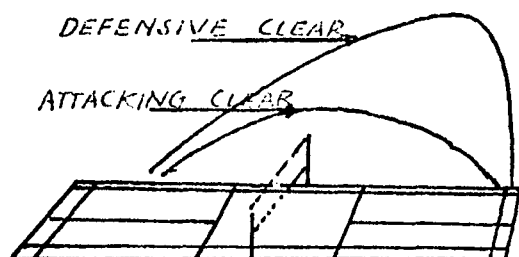
PROGRAM 65 (continued)

THE UNDERHAND ATTACKING CLEAR
THE MECHANICS

(a) One that lands near the short service line.

5. What kind of shot are you looking for to execute an underhand attacking clear?
(a)

6. Your attacking clear has a flat arc as opposed to the high, deep one of the defensive clear. It also has a faster trajectory.



Because of this you must stroke it with less upward angle. This means controlled power to keep it within the back boundary line but fast enough to get behind your opponent. You will have to restrict your follow-through to keep it in the court.

7. You can use it mostly in singles and its variance of height will depend on the size and speed of your opponent. It should be high enough to clear your opponent's racket and then start to fall.

8. If your attacking clear gets behind your opponent on his backhand side, he will probably give a weak return to your forecourt which you should be able to put away.

PROGRAM 65 (continued)

THE UNDERHAND ATTACKING CLEAR
THE MECHANICS

- (a) behind
(b) backhand
(c) weak

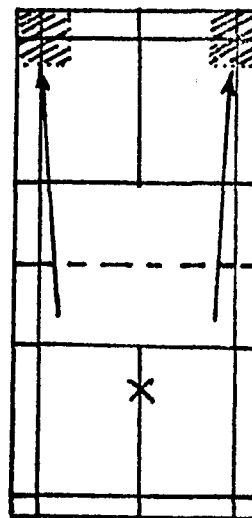
9. Answer the following question:
Your objective is to get the shuttle (a) _____ him
on his (b) _____ side to
force him to make a (c) _____
return.

CRITERIA TEST FRAME 65

TASK

(_ out of 10)

Stand in ready position.
Have your partner hit you 10
underhand drop shots to the
forehand corner and then the
backhand corner of your fore-
court. You attempt to hit
down-the-line offensive clears
to the green target areas.
Try to get 5 out of 10 in. If
you are unsuccessful repeat
the exercise but no more than
3 times. Record scores on
answer sheet.



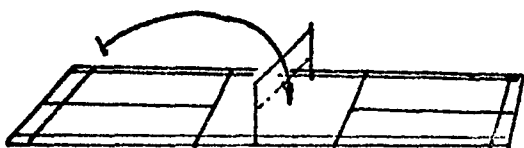
PROGRAM 66

OVERHEAD DROP SHOT
FLIGHT PATTERNS OF LOOP AND FAST DROP SHOTS

Objective

The student must be able to draw the 2 flight patterns of the loop and fast drop shots from an overhead position.

1. This is the flight pattern of a loop drop shot.

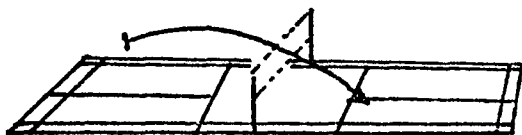


CRITERIA TEST FRAME 66A

(Picture)

Draw the flight pattern of a loop drop shot on your answer sheet.

2. This is the flight pattern of the fast drop shot.



CRITERIA TEST FRAME 66B

(Picture)

Draw the flight pattern of the fast drop on your answer sheet.

PROGRAM 67 (Requires Court Space)

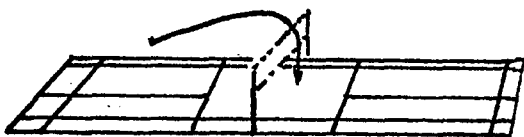
OVERHEAD DROP SHOT
EXECUTION OF LOOP DROP SHOTS

Objective

The student must be able to show that he can consistently hit loop drop shots by hitting 5 out of 10 from an overhead position to the green target area.

1. Loop drop shots have a definite purpose of getting the shuttle closer to the net in a drop shot flight.

2. In order to do this you have to give the shuttle a higher trajectory as it leaves your racket.



It must go FORWARD IN AN UPWARD direction toward your opponent's court. As it loses speed going forward, it will curve down and fall almost perpendicularly-- hopefully just missing the top of the net to land a few inches within your opponent's court.

- (a) forward
(b) upward

3. Complete the following statement:

A loop position requires impetus (a) _____ in a (b) _____ direction.

PROGRAM 67 (continued)
OVERHEAD DROP SHOT
EXECUTION OF LOOP DROP SHOTS

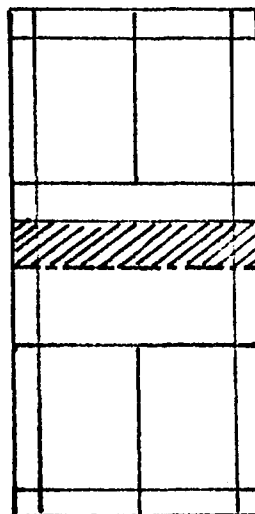
CRITERIA TEST FRAME 67

TASK

(__ out of 10)

Forehand and Backhand

Have your partner set up to you medium-high long services. Try to get 5 out of 10 loop drop shots on both the forehand and backhand in the green target area. If you are unsuccessful, repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 68 (Requires Court Space)

OVERHEAD DROP SHOT
EXECUTION OF FAST DROP SHOTS

Objective

The student must be able to show that he can consistently hit fast drop shots by hitting 5 out of 10 from an overhead position in both forehand and backhand position to the green target areas.



1. Your racket will direct the shuttle DOWNWARD from its contact point. The shuttle should SKIM past the top of the net and land into your opponent's forecourt--even as far out as the short service line.

2. For all types of drop shots meet the shuttle at the earliest possible moment and at its highest point.

3. All drop shots must be stroked FIRMLY in a relaxed manner. If you baby or tense up your wrist you will lose your consistency. Your wrist should release in a slow-motion type action to allow the racket to guide the shuttle over the net. If you think of "pressing" the shuttle on the forward wrist bend you may be more successful.

- (a) firmly
(b) guided

4. Complete the following statement:

Drop shots are to be stroked
(a) _____ and (b) _____
over the net.

PROGRAM 68 (continued)

OVERHEAD DROP SHOT
EXECUTION OF FAST DROP SHOTS

5. You must develop the feeling that you are hitting THROUGH the shuttle rather than AT it at contact point. The little follow through that you have should add to the smoothness of the stroke.

Hearing little noise at contact point means that you are on the right track.

6. When you learn the overhead drop shot you want to use the same full body and arm swing as on your clear and smash. Learning this deception early will be an important asset to your game.
-

7. Your starting position is the same as hitting an overhead clear. Contact the shuttle as high as possible in its flight and far enough ahead of you so that its flight will be downward at the moment of racket contact. Your arm must be fully extended in order to direct it downwards.
-

8. The downward trajectory of the shuttle comes from the following:

An extended arm, wrist action with controlled stroking, and racket face tilted downward.

PROGRAM 68 (continued)

OVERHEAD DROP SHOT
EXECUTION OF FAST DROP SHOTS9. FAST BACKHAND DROP SHOT

You may choose to use your thumb in directing the downward flight of the shuttle or not. Strength is not a factor here but control is. Again think of pressing the racket head forward.

10. Take the position of your overhead backhand clear. Your right foot is forward and your body is turned so that your back is facing the net.

You will contact the shuttle as high as you can reach and slightly in front of your right shoulder.

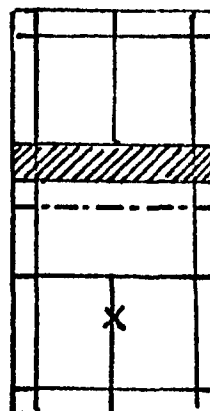
CRITERIA TEST FRAME 68

TASK

(_ out of 10)

Forehand and Backhand

Have your partner set up to you medium-high long services. Try to get 5 out of 10 fast drop shots on both the forehand and backhand in the green target area. If you are unsuccessful, repeat the exercise but no more than 3 times. Record on answer sheet.



PROGRAM 69 (Requires Court Space)

OVERHEAD DROP SHOTS
COMBINATION USE OF LOOP AND FAST DROP SHOTS

Objective

The student must be able to execute a combination of 5 out of 10 overhead loop and fast drop shots to the front corners of the badminton court (green target areas).

CRITERIA TEST FRAME 69

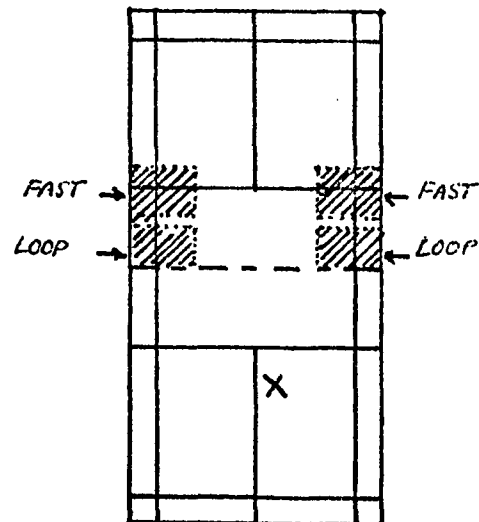
TASK

(__ out of 10)

Right and Left Courts

Have your partner serve you 10 medium-high long services (to the same service court) and you practice returning drop shots (alternating loop and fast) to the front corners of the opponent's court. Attempt to get a score of 5 out of 10 in the green target areas from both the right and left courts. If you are unsuccessful repeat the exercise but no more than 3 times.

Record on answer sheet.



PROGRAM 70

THE SMASH
ITS IMPORTANCE

Objective

The student must realize the importance of the smash as being the main point-winning stroke in badminton by supplying the correct answers to the criteria frame.

1. In this stroke you must learn to swing your racket head faster than in any other stroke by using the full power of your body, arm and wrist in combination with perfect timing.

2. The flight of the shuttle is downward at maximum speed.

3. You have 2 purposes in learning the smash. You are trying to win the point outright or force your opponent to make a weak return which may be put away by you or your partner.

Do not expect to win on every smash.

CRITERIA TEST FRAME 70

(Completion)

- (a) downward
- (b) speed

4. Supply the missing words in the following statement:

The smash is the main point-winning stroke in badminton because of the shuttle being hit (a) _____ at maximum (b) _____.

PROGRAM 71 (Requires Court Space)

THE SMASH
EXECUTION

Objective

The student must be able to hit 5 out of 10 smashes successfully from the center of his own court to the green target area in his opponent's court.

1. In order to have a firm foundation from which to hit you must at least keep the toes of the front foot on the floor at contact.
-

2. With your left foot ahead of your right and your body at a right angle to the net, cock the head of your racket behind your head and right shoulder. The racket will be horizontal to the floor with a cocked wrist.
-

3. The follow-through is down and in line with the flight of the shuttle.
-

PROGRAM 71 (continued)

THE SMASH
EXECUTION

4. The action of "throwing" the racket head at the shuttle will give the impetus your wrist has to give to hit a good smash.

Your arm will be fully extended when the shuttle is struck downward at the highest possible point. The racket face is pointed downward at contact point.

This point of contact is approximately 1 foot in front of the forward foot and in line with the right shoulder.

5. In order to take full advantage of your racket head speed, be sure the racket face meets the shuttle squarely.
-

6. The higher the angle at which you contact the shuttle, the more sharply it can be angled downward into the opponent's court.
-

7. Remember the farther away you are from the net the less angle to the floor you can get and the less speed your smash will have when it gets there because of the distance it has to travel.
-

PROGRAM 71 (continued)

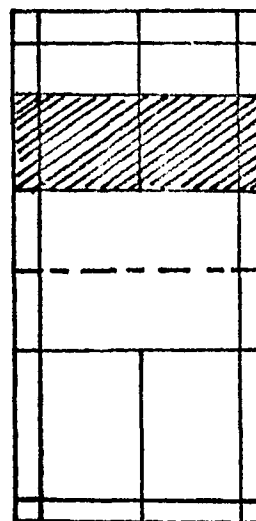
THE SMASH
EXECUTION

CRITERIA TEST FRAME 71

TASK

(__ out of 10)

Stand in ready position and have your partner set up 10 medium high underhand clears to you. Attempt to smash 5 out of 10 shuttles downward to the vicinity of your partner's short service line (green target area). If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 72 (Requires Court Space)

THE SMASH
SET-UP-TO-SELF

Objective

The student must be able to set the shuttle up to himself while standing in front of his own short service line and smash downward to the green target area of the opposite court 5 out of 10 times.

1. Stand in front of your short service line in stride position with your left foot ahead of your right. Your body is at a right angle to the net.

2. Place the shuttle with its feathers resting on your racket face. Toss the shuttle upward in front of your right shoulder. Extend your arm on upward and cock your wrist and forearm back. Hit the shuttle ahead of your body and higher than your racket can reach. Uncock the wrist and hit the shuttle downward in the vicinity of the short service line.

PROGRAM 72 (continued)

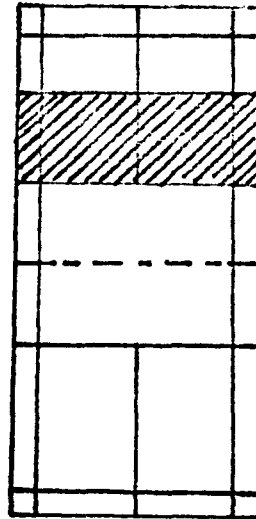
THE SMASH
SET-UP-TO-SELF

CRITERIA TEST FRAME 72

TASK

(__ out of 10)

Set the shuttle up to yourself in front of the short service line and smash the shuttle downward in the vicinity of your partner's short service line. (Green target area). Try to get 5 out of 10 in the green target area. If you are unsuccessful repeat the exercise but no more than 3 times. Record on answer sheet.



PROGRAM 73 (Requires Court Space)

PRINCIPLES OF NET PLAY

Objective

The student must be able to demonstrate the principles of net play by rallying with a partner back and forth across the net 5 times in a row.

1. Extend your arm and racket so that you can just touch the net. This distance will give you unrestricted movement and also permit you to cover mid-court shots as well. Now return to your base position.

2. When shots are hit to your backhand you should adjust your grip slightly by placing the side of your thumb up the back bevel of your racket. This will add more strength and control to your wrist.

3. You will use a flat grip for your net shots. Put your racket on the floor and pick it up like a hammer. The back of your hand will be on top. An inch of the handle should extend below your palm. This is the best grip for all net level shots.

4. Teach yourself to contact the shuttle as near the net as possible and as far above the top or as near the top of the net as possible. Never allow the shuttle to fall below the bottom of the net.

PROGRAM 73 (continued)

PRINCIPLES OF NET PLAY

5. With a slight turn of your wrist you are to hit the shuttle lightly but firmly enough to barely cross the net where it should fall perpendicularly to the floor.

6. You must use your body to reach. The actual stroking will be done by your forearm, wrist and hand combined with hitting the shuttle with a FLAT FACE to the direction in which you want the shuttle to go.

7. Your footwork around the net should be in the form of fast, small steps. Practice turning and covering the length of the net pretending that you are hitting net shots on both your forehand and backhand sides.

8. Your LEFT foot should be forward on FOREHAND shots and your RIGHT foot on the BACKHAND SHOTS. Sometimes your right foot can be forward to get extra reach on your forehand side.

9. Your follow-through will be in the direction you want the shuttle to go. Besides guiding the shuttle you must follow it being careful not to hit the net.

PROGRAM 73 (continued)

PRINCIPLES OF NET PLAY

10. After playing any net shot, especially a good one--keep your racket up ready to flick down any poor return made by your opponent.
-

CRITERIA TEST FRAME 73

TASK

(__ times in a row)

Stand in a square stance facing your partner across the net. Practice hitting net shots back and forth with your racket in a hammer grip developing a delicate touch. Hit the shuttle 5 times in a row. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.

PROGRAM 74
 NET SHOTS
 ILLUSTRATIONS

Objective

The student must be able to draw the 3 types of net shots that he will be learning in this program.

1. For our use net shots will be those played in the area around the short service line to the net.

2. One type of shot is hit very delicately at a point near the net tape so that it crosses over and drops quickly to the floor. It is termed HAIRPIN because of the path it takes.



3. A second type of net shot is hit sharply downward from a point slightly higher than the top of the net. It will be called a SMASH.



4. A third type of net shot is played at or above net level with the head of the racket up and a flat face. Its direction is angled DOWNWARD and called a PUSH SHOT.



CRITERIA TEST FRAME 74

(Picture)

Draw the following 3 net shots on your answer sheet.

Hairpin

Smash



Push shot

PROGRAM 75

THE PURPOSE OF DROP SHOTS

Objective

The student must know the 3 reasons for using the drop shot by answering the criteria test frame correctly.

1. The drop shot is invaluable because it enables you to use the front corners of the court.
-

Hit to the front corners 2. What does this shot do that you can't do with others?

3. You will use this mostly in singles because with one opponent a good drop will move him far into his forecourt which will take him out of position to open up more court for you.
-

(a) forecourt
(b) out of position

4. A good drop will move your opponent into the (a) _____ and (b) _____.
-

5. A good drop shot falls just over the net into your opponent's forecourt. You can learn to hit it from any part of the court and from a high or low position and across any part of the net. There is much variation in its flight. It can be used to return smashes and as a set up for smashes.
-

PROGRAM 76 (Requires Court Space)

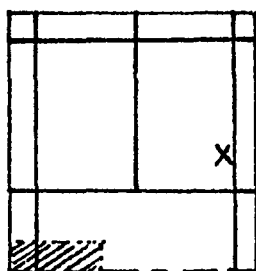
CROSS COURT NET SHOTS

Objective

The student should be able to execute 5 out of 10 cross-court drop shots from his own forecourt. (both forehand and backhand)

1. A cross-court net shot is of special value because it lengthens the flight of the shuttle and flattens the angle of return which will not give your opponent an easy return.

2. To get the right direction for a cross-court shot you have to turn your racket slightly to that direction and STROKE it cross-court with a FIRM manner and good FOLLOW-THROUGH. Jabbing or tapping the shuttle has no place here.



3. Cross-court net shots should be placed the greatest distance from your opponent. This will make him travel further which gives the shuttle more time to fall to the floor.

4. Contact the shuttle about a foot in front of the body and control the racket with your wrist and fingers. You have to hit THROUGH the shuttle in a delicate but firm manner.

5. There is little follow-through because little power is desired.

PROGRAM 76 (continued)

CROSS COURT NET SHOTS

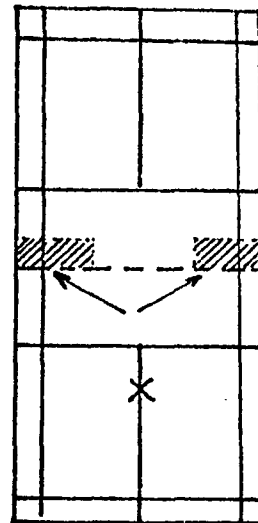
CRITERIA TEST FRAME 76

TASK

(__ out of 10)

Forehand and Backhand

Have your partner set up the net shots from an underhand position. Stand at your home position and step forward to hit 5 out of 10 cross-court drop shots to the green target area as close to the net but as far away from your opponent as possible. Do this on both your forehand and backhand sides. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 77 (Requires Court Space)

HAIRPIN DROP SHOTS

Objective

The student must be able to execute 5 out of 10 hairpin drop shots from his own short service line on both his forehand and backhand to the green target areas.

1. Remember that hair pin drop shots can only be directed upward--the perfect one should creep up and over the net and trickle down the opponent's side of the net.



Be careful not to pop it up too high!

2. If a shuttle coming to your side should hit the net cord and roll over to your side, wait for the shuttle to right itself by falling a few inches before you try to guide it back over the net.
-

PROGRAM 77 (continued)

HAIRPIN DROP SHOTS

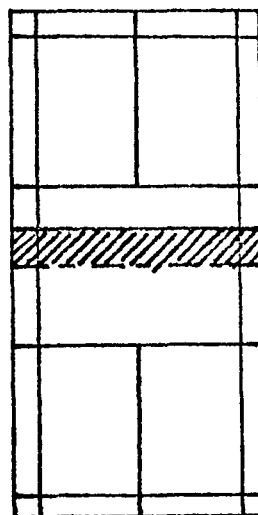
CRITERIA TEST FRAME 77

TASK

(__ out of 10)

Forehand and Backhand

Stand in ready position at the short service line. Have your partner set up the net shots. Stand in your home position and step forward to hit 5 out of 10 hairpin drop shots as close to net height as possible. If you are unsuccessful repeat the exercise but no more than 3 times. Do both forehands and backhands. Use the green target areas. Record your scores on your answer sheet.



PROGRAM 78 (Requires Court Space)

RETURN OF SMASH WITH AN UNDERHAND DROP SHOT

Objective

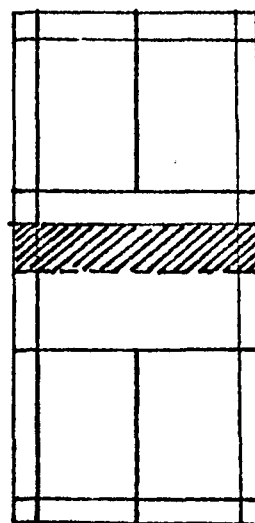
The student must be able to return 5 out of 10 medium paced smashes from mid-court with an underhand drop shot to the green target area.

CRITERIA TEST FRAME 78

TASK

(out of 10)

With a partner do the following exercise. Stand at your home position and set up underhand clears at mid-court to your partner who in turn hits medium paced smashes back at you to block with a drop shot over the net. Try to succeed 5 out of 10 times to the green target area. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 78A (Requires Court Space)

CLEAR, SMASH, DROP

Objective

The student must be able to execute successfully the CLEAR, SMASH, DROP drill with a partner.

CRITERIA TEST FRAME 78A

TASK

(Successful or Unsuccessful)

Ask a partner to do the following drill with you:

Partner A starts shuttle with an underhand clear to mid-court.

Partner B executes a medium paced smash to mid-court on his partner's racket side.

Partner A blocks the smash with his racket and returns it with an underhand drop.

Partner B underhand clears.

Partner A smashes.

Partner B blocks and drops.

As you become more proficient with this drill try to increase the speed of the smashes or increase the number of times you can do the complete sequence.

PROGRAM 79 (Requires Court Space)

UNDERHAND DROP SHOTS
A GAME

Objective

Two students should be able to play an underhand drop shot (hairpin or crosscourt) game of badminton from in front of their short service lines using these drop shots from within the short service lines.

CRITERIA TEST FRAME 79

Whom did you play?

What was your score?

The game is started from behind the short service line with a legal underhand short serve. From there on all shots must be underhand drop shots that have to land within the short service line. Play an 11 point game. Record on back of answer sheet.

PROGRAM 80 (Requires Court Space)

BACKHAND DROP SHOTS
ALTERNATE OVERHEAD AND UNDERHAND

Objective

The student must be able to execute 5 out of 10 overhead and underhand backhand drop shots in the green target areas from the area around the short service line.

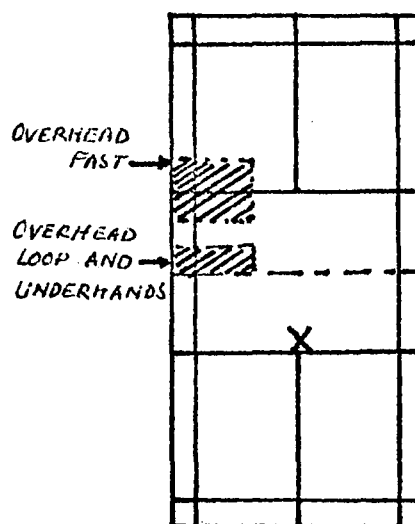
CRITERIA TEST FRAME 80

TASK

(__ out of 10)

Backhand overheads and underhands.

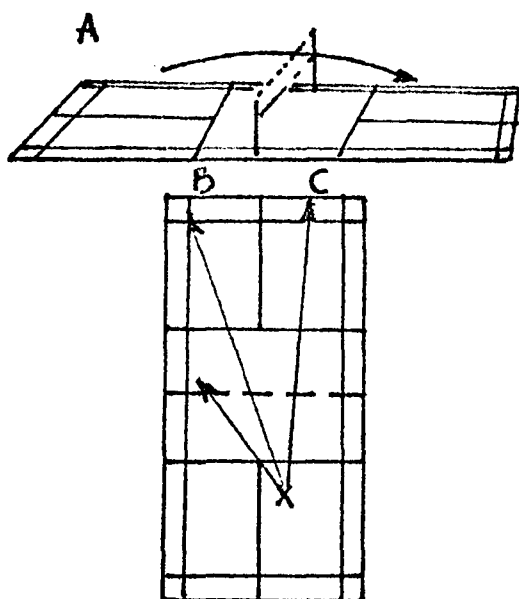
Stand at the short service line and return overhead and underhand drop shots that have been set up to you by your partner to your backhand side. One set up should be below the level of the net and the other reach high, both to the backhand side. Try to get 5 out of 10 into the green target areas. If you are unsuccessful, repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 81
THE DRIVE
FLIGHT PATTERNS

Objective

The student must be able to draw the flight patterns of a good drive.



1. The flight pattern of a good drive (A) is parallel to the floor and just skims the top of the net from behind the opponent's short service line on. A drive can be played cross-court (from one sideline diagonally across the court to the other sideline) (B) or down the line (parallel to the sideline) (C)

CRITERIA TEST FRAME 81
(Picture)

Draw the flight patterns of a good drive on your answer sheet.

PROGRAM 82

THE FOREHAND DRIVE
ITS GREATEST VALUE

Objective

The student must be able to understand that the greatest value of the drive is in the game of mixed doubles by giving the correct answer to the criteria frame.

1. The greatest value in the drive is in mixed doubles in the up and back position where it can be used with variety in pace and placement. It is also used as an attacking stroke in singles and doubles.
-

CRITERIA TEST FRAME 82

(Completion)

Mixed doubles

Record on your answer sheet.
In what game of badminton
does the drive have its
greatest value? _____

PROGRAM 83

DRIVES
CROSS-COURT AND DOWN-THE-LINE

Objective

The student must be able to apply the principle of early and late shuttle contact for down-the-line and cross-court shots by completing the proper statements in the criteria test frame.

1. You should contact the shuttle about a foot in front of the body.

2. If you want the shuttle to go cross-court you will hit it early.

3. If you want the shuttle to go down-the-line you will hit it later.

CRITERIA TEST FRAME 83

(Completion)

(a) early

(b) late

Answer the following questions on your answer sheet:

To hit a cross-court shot the shuttle must be struck (a).

To hit a down-the-line shot, hit the shuttle (b).

PROGRAM 84

THE FOREHAND DRIVE
WRIST STRENGTH

Objective

The student must consistently be able to make a "swishing" sound with the racket head on the forward swing of the forehand drive 5 times in a row. He must start with the same consistent backswing each time.

CRITERIA TEST FRAME 84

TASK

(Successful or Unsuccessful)

With your partner listening, attempt 5 "swishes" of the racket head at an imaginary shuttle in a horizontal plane. These must be done consecutively. If you are unsuccessful repeat the exercise but no more than 3 times. Record on your answer sheet.

PROGRAM 85 (Requires Court Space)

THE FOREHAND DRIVE
THE MECHANICS

Objective

The student must be able to execute the mechanics of the forehand drive by hitting 5 out of 10 hard ones and 5 out of 10 gentle (half-court) ones down the line and cross-court from his home position.

1. Most of your drives will be hit around chest height on both the forehand and backhand sides of your body but they can also be hit at varying levels between the shoulder and the knee.

If you are playing the shuttle at knee level you should be in the backcourt.

2. If you hit the shuttle too high over the net it can be easily intercepted and dropped back over the net. Hit the shuttle lower than the level you contacted it if at all possible.
-

3. Try to contact the shuttle as high as possible and ahead of your body on all drives. Height will allow you to use more speed and give you a greater margin of safety in clearing the net.
-

4. A good hard drive hit at shoulder or head level can almost be considered a sidearm smash when it is hit to an open space on your opponent's court. Others can be hit as gently as a drop shot.
-

PROGRAM 85 (continued)

THE FOREHAND DRIVE
THE MECHANICS

5. The follow-through will turn your body back into a good position on the court facing the net ready for your opponent's next shot. Your racket will continue in the direction of your shot. The racket will eventually end up by your left shoulder which is practically a 360 degree circle.

Do not try to stop your follow-through.

6. As your elbow straightens out, your body weight will pivot and your weight will transfer to the forward foot. Your wrist does not uncock until just before the shuttle is struck. It should be an explosive movement at contact if a deep drive is desired.

7. On the forward swing whip the racket head forward with your wrist in a line parallel with the floor. It should make a swishing motion.

8. At the end of your backswing the head of the racket should touch between the shoulder blades.

- (a) Drop
(b) Clear
(c) Smash

9. What other three strokes have this same starting place for their backswing?

(a) _____ (b) _____ (c) _____

PROGRAM 85 (continued)

THE FOREHAND DRIVE
THE MECHANICS

-
10. To prepare for the drive, draw your racket back slowly and deliberately with your elbow bent and your wrist cocked. At the end of your backswing your body will have turned so that your back is toward the net. Both of your knees will be bent and your weight is on the back foot.
-
11. The body position for a deep drive is to have your left foot placed in front of the right and farther out toward the right sideline than your right foot.
-
12. You should contact the shuttle with a flat racket diagonally ahead of your left foot. It should be a comfortable reach with your arm fully extended.
-
13. If you want to drive from halfway up the court your body will be at right angles to the net and your feet are parallel to the sideline. You will strike the shuttle at about waist height.
-
14. To hit a drive near the net, catch it as near the level of the tape as possible--all you have to do is turn your wrist for the power you need.
-

PROGRAM 85 (continued)

THE FOREHAND DRIVE
THE MECHANICS

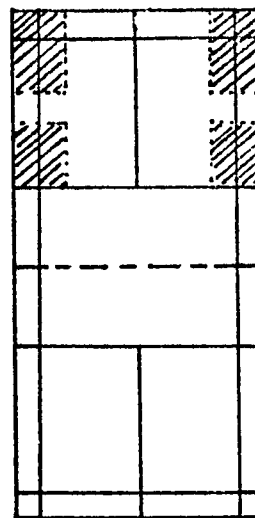
CRITERIA TEST FRAME 85

TASK

(__ out of 10)

Forehand and Backhand

Start in ready position. Have your partner set up 10 drives to you on your forehand side and then your backhand side. You vary the speed and distance of each return by trying to hit 5 out of the 10 down-the-line deep or close to the net. Alternate the depth of each shot. Attempt to do the same exercise for the backhand. If you are unsuccessful repeat the exercise but no more than 3 times. Aim for the green target areas. Record your scores on your answer sheet.



PROGRAM 86

THE FOREHAND DRIVE
EYE-HAND COORDINATION

Objective

The student must be able to execute proper form and eye-hand coordination on the forehand drive by hitting a rubber tipped shuttle against the wall 5 times in a row, from a distance of at least 10 feet.

CRITERIA TEST FRAME 86

TASK

(__ times in a row)

With your partner watching, stand at least 10 feet from the wall and attempt to rally the shuttle against the wall 5 times in a row. Your partner will give you a subjective rating on form for the drive position. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on your answer sheet.

PROGRAM 87 (Requires Court Space)

THE FOREHAND DRIVE
ACCURACY

Objective

The student must be able to return driven shuttles that are close to the net (within 6 inches) with a forehand drive as near the level of the tape (within 6 inches) as possible and keep it in the court 5 out of 10 times.

CRITERIA TEST FRAME 87

TASK

(__ out of 10)

Tie the green string 6" over the net tape. Get in ready position and have your partner set up 10 drives close to the net (under the green string) and you try to hit 5 of those 10 in forehand drive position back under the green string. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on your answer sheet.

PROGRAM 88 (Requires Court Space)

THE FOREHAND DRIVE
ACCURACY

Objective

The student must be able to return the shuttle that is driven to him at the same height or lower than the one that was hit to him 5 out of 10 times.

CRITERIA TEST FRAME 88

TASK

(__ out of 10)

Stand in ready position. Have your partner set up 10 drives close to the net and you attempt to return the shuttle at the same height or lower than the one that was hit to you. Attempt to do this 5 out of 10 times. If you are unsuccessful, repeat the exercise but no more than 3 times. Record scores on answer sheet.

PROGRAM 89

STROKES ON THE BACKHAND SIDE
ELBOW PRINCIPLES

Objective

The student must be able to apply the principle of the elbow acting as a hinge joint for backhand strokes by answering the criteria test frame correctly.

1. With your right shoulder pointing towards the net, place the neck of the racket against your left shoulder. Raise your right elbow until your right forearm is parallel to the ground.
-

2. On the backhand the elbow bends and acts as a hinge joint. You must point your elbow directly at the shuttle in the direction you want the shuttle to go as follows:

DOWN--for low shots

NET HIGH--for drives

UP--for overhead clears, drop shots, and smashes.

3. The elbow must be bent so that it can help the wrist in adding power and speed to the stroke. It does this by straightening out in the forward swing.
-

4. The elbow and forearm make an approximate 90 degree angle and the wrist is sharply cocked. When uncoiling the hinge joint the arm is straightened and your weight goes to the right foot and just before the shuttle is struck the wrist uncocks.
-

PROGRAM 89 (continued)
STROKES ON THE BACKHAND SIDE
ELBOW PRINCIPLES

CRITERIA TEST FRAME 89

(Completion)

- (a) down
- (b) Net high
- (c) up

Tell in what direction the elbow should point for the following shots:

- Low shots (a) _____
- Drives (b) _____
- Overhead clears, drop shots, and smashes (c) _____

PROGRAM 90

THE BACKHAND DRIVE
WRIST STRENGTH

Objective

The student must consistently be able to make a "swishing" sound with the racket head on the forward swing of the backhand drive 5 times in a row. He must start with the same consistent backswing each time.

1. On your backhand drive you have to learn to coil and uncoil your body for added strength with a weight shift forward when you contact the shuttle.

2. On the backswing the racket head is pointing downward with the thumb of your right hand pointing to the floor. The back of your hand will be directly in line with your eyes.

3. To get the wrist snap and swishing sound, your weight shifts from back to front foot, your shoulders turn, your racket arm starts swinging forward with the elbow leading. Then the head of the racket whips upward and through followed by the follow-through in a long, flat arc. Your wrist will rotate and roll over slightly and you will end up facing the net squarely ready for the next stroke.

PROGRAM 90 (continued)

THE BACKHAND DRIVE
WRIST STRENGTH

-
4. The pressure of your thumb behind the racket handle will help in getting extra snap.
-

CRITERIA TEST FRAME 90

TASK

(Successful or Unsuccessful)

With your partner listening, attempt 5 "swishes" of the racket head at an imaginary shuttle. These must be done consecutively. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on your answer sheet.

PROGRAM 91 (Requires Court Space)

THE BACKHAND DRIVE
THE MECHANICS

Objective

The student must be able to execute the mechanics of the backhand drive by hitting 5 out of 10 hard ones and half-court ones (gentle) down the line.

1. Take the same backswing for all your backhand drives to fool your opponent and adjust the length and speed of your shots by the amount of wrist movement and follow-through.

2. Force yourself to take the shuttle as high and early as possible by moving toward it.

3. To hit a backhand drive from the back of the court, you will get power by placing your right foot closer to the left sideline than the left foot. This will turn the body so your back faces the net. Bend your right knee and bring the racket back to hip level.

4. If you are close to the net and want to hit a backhand drive stay in your position squarely facing the net, move your right shoulder slightly to the left as you draw your racket back. Your thumb, wrist and the forward movement of your arm will supply the amount of speed and direction you desire.

PROGRAM 91 (continued)

THE BACKHAND DRIVE
THE MECHANICS

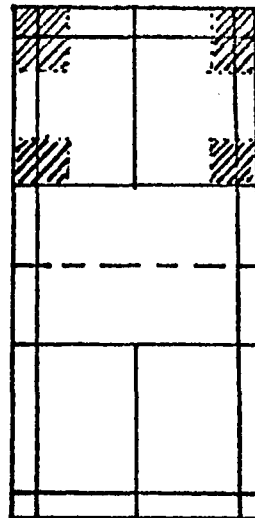
-
5. To hit a backhand drive half-way up the court, your feet will be parallel and your body must turn to the left. Just the turning of your body should give enough power.
-

CRITERIA TEST FRAME 91

TASK

(__ out of 10)

Start in ready position. Have your partner set up 10 drives to you on your backhand side. You vary the speed and distance of each return by trying to hit 5 out of 10 down-the-line deep or half-court to the green target areas. Alternate each shot. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on your answer sheet.



PROGRAM 92

THE BACKHAND DRIVE
EYE-HAND COORDINATION

Objective

The student must be able to execute proper form and eye-hand coordination on the backhand drive by hitting a rubber tipped shuttle against the wall 5 times in a row from a distance of at least 10 feet.

CRITERIA TEST FRAME 92

TASK

(Successful or Unsuccessful)

With your partner watching, stand at least 10 feet from the wall and attempt to hit the shuttle against the wall 5 times in a row. Your partner will give you a subjective rating on form for the drive position. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on your answer sheet.

PROGRAM 93 (Requires Court Space)

THE BACKHAND DRIVE
ACCURACY

Objective

The student must be able to return driven shuttles that are close to the net (within 6 inches) with a backhand drive as near the level of the tape (within 6 inches) as possible and keep it in the court 5 out of 10 times.

CRITERIA TEST FRAME 93

TASK

(_ out of 10)

Set the green string 6" over the net tape. Get in ready position and have your partner set up 10 drives close to the net (under the green string) and you try to hit 5 of those 10 in backhand drive position back under the green string. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.

PROGRAM 94

THE AROUND-THE-HEAD-STROKE
ADVANTAGES AND DISADVANTAGE

Objective

The student must be able to realize the value of the around-the-head strokes as a good replacement for some backhand shots by answering the questions in the criteria frame.

1. Around-the-head shots may be in the form of a (1) clear, a (2) half-court smash, or a (c) cross court or straight ahead drop shot. An around-the-head shot is forehand hitting with the forehand side of your racket on the left side of your body.
-

2. Backhand type shots are usually defensive so learning an around-the-head shot is useful because you can keep the attack by hitting down.

If you have a weak backhand you may want to use the around-the-head shot instead of your backhand.

- (a) attack
(b) down

3. Supply the missing words in the following statement:

The value of the around-the-head stroke is that you can keep the (a) _____ by hitting (b) _____.

PROGRAM 94 (continued)

THE AROUND-THE-HEAD-STROKE
ADVANTAGES AND DISADVANTAGE

4. A disadvantage of the shot is that it takes you away from the center of the court which leaves more space for your opponent to hit into. In other words you are sacrificing court position from center.

(a) sacrificing

5. The disadvantage of the around-the-head stroke is that of (a) court position from center.

CRITERIA TEST FRAME 94

(Completion)

Clear
Half-court smashes
Drop shots

What shots can be hit with
around-the-head strokes?

Record on answer sheet.

PROGRAM 95

AROUND-THE-HEAD STROKE
MECHANICS

Objective

The student must be able to correctly execute the around-the-head stroke by hitting the basketball net or suspended shuttle with an extended arm at contact point 10 times in a row.

1. You will have to experiment with the grip. Most people use the forehand grip but some like the flat or frying pan grip. Experiment and use the grip that helps you get a flat racket face on the shuttle.
-

(a) Flat or frying pan

2. If you are having trouble with the forehand grip in getting flat shots with the around-the-head stroke, what other grip would you change to? (a) _____
-

3. Your body will want to lean heavily to the left and your weight will be on your left foot and your wrist has to supply the speed to the racket head for angle and direction on the forehand side of your racket.
-

4. Practice your overhead forehand stroke motion. Now swing your right arm back with a bent elbow and then OVER and AROUND YOUR HEAD TO MEET the shuttle on the LEFT SIDE of your body. You must arch your back and bend your knees to make this shot.
-

PROGRAM 95 (continued)

AROUND-THE-HEAD STROKE
MECHANICS

-
5. People who are more flexible will swing the racket back, behind, and around-the-head. Your forearm will brush past the top of the head before it straightens out to contact the shuttle.
-
6. Your weight has to be balanced on your left foot. If you reach too far to the left you will tend to fall towards the left sideline which is too far away from your home position.
-
7. At contact point your racket face points upward, your weight is on the left foot. Then make yourself move quickly to your right foot and return to the center of the court.
-
8. On the follow-through your right leg will swing forward.
-

CRITERIA TEST FRAME 95

TASK

(Successful or Unsuccessful)

Stand a few feet to the right of an overhanging basket and reach with an extended arm toward the net. Take a full backswing and go through the mechanics of the around-the-head shot along with the weight shift. Attempt to hit the basketball net or suspended shuttle 10 times in a row. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.

PROGRAM 96 (Requires Court Space)

AROUND-THE-HEAD CLEARS
DOWN THE LINE AND CROSS COURTS

Objective

The student must be able to execute 5 out of 10 around-the-head clears straight down the side line to the back corner and half-court and 5 out of 10 cross-court to the back corner and half-court.

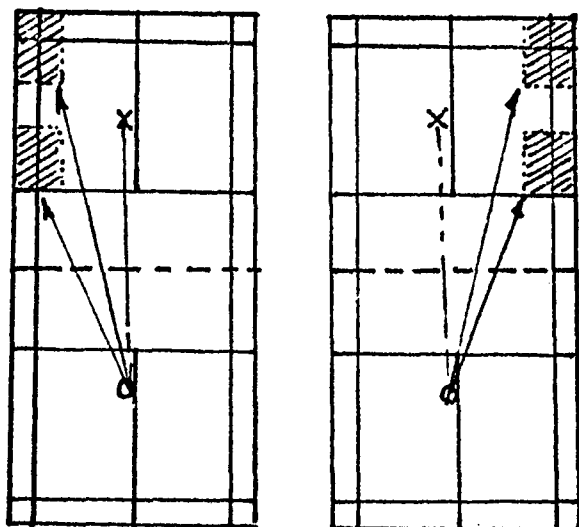
CRITERIA TEST FRAME 96

TASK

(__ out of 10)

Down-the-line and Cross-Court

Stand in ready position. Have your partner set up 10 medium high clears to your backhand side. Attempt to hit 5 out of 10 half-court clears downward down the left side line and full clears to the back corner. Use the green target areas. Try the same exercise cross-court too. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 97 (Requires Court Space)

AROUND-THE-HEAD DROP SHOTS
EXECUTION

Objective

The student must be able to execute 5 out of 10 around-the-head drop shots straight ahead and 5 out of 10 cross court into the green target areas.

1. At contact point the racket face points toward the net for the straight drop shot.

2. For the cross-court pull the racket head around toward your right shoulder.

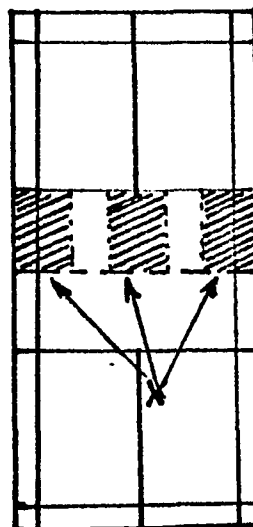
CRITERIA TEST FRAME 97

TASK

(__ out of 10)

Down-the-line and cross-court

Stand in ready position. Have your partner set up 10 medium high clears to your backhand and you try to get 5 out of 10 straight drop shots into the green target area and 5 out of 10 cross-courts into the green target area. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 98 (Requires Court Space)

AROUND-THE-HEAD SMASHES
EXECUTION

Objective

The student must be able to execute 5 out of 10 around-the-head smashes straight ahead and 5 out of 10 cross courts in the around-the-head position to the green target areas.

1. For the smash your racket face will point downward at contact point.

2. For the cross-court pull the racket head around toward your right shoulder.

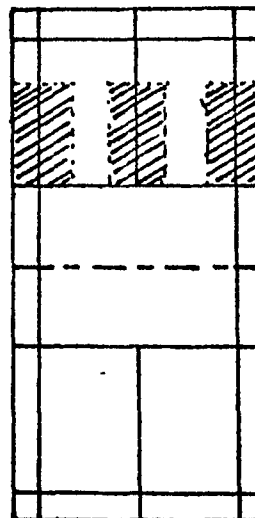
CRITERIA TEST FRAME 98

TASK

(__ out of 10)

Straight ahead and cross-court

Stand in ready position. Have your partner set up 10 medium high clears to your backhand and you try to get 5 out of 10 straight smashes and 5 out of 10 cross-court smashes into the green target area. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.



PROGRAM 99

AROUND-THE-HEAD
COMBINATION CLEARS, DROP SHOTS, AND HALF-SMASHES
DOWN-THE LINE AND CROSS COURT

Objective

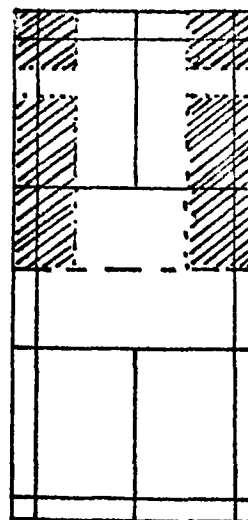
The student must be able to alternately hit a total of 5 out of 10 around-the-head clears, dropshots, and half smashes to the green target areas from the home position with the same preparation for each up to contact point.

CRITERIA TEST FRAME 99

TASK

(__ out of 10)

Stand in home position. Have your partner set up 10 medium high underhand clears to your backhand side. Alternately hit in clockwise direction clears, half-smashes, and drop shots from the round-the-head position. Aim for the green target areas. If you are unsuccessful repeat the exercise but no more than 3 times. Record scores on answer sheet.

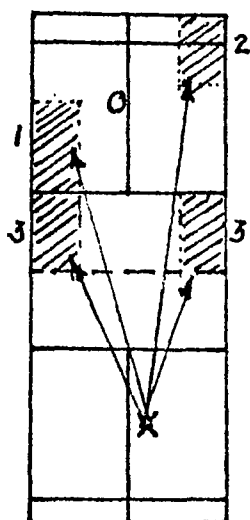


PROGRAM 100 (Requires Court Space)

AROUND-THE-HEAD
RETURN OF DRIVE SINGLES SERVE

Objective

The student must be able to return 5 out of 10 drive serves successfully by using an around-the-head shot into the green target areas.



1. Your opponent will try a drive serve to your backhand so the best thing for you to do is drive back in a downward fashion to the left (1) or drive clear of your opponent to his backhand. (2). This means being able to get your racket around in front of you. Use your around-the-head shot here.

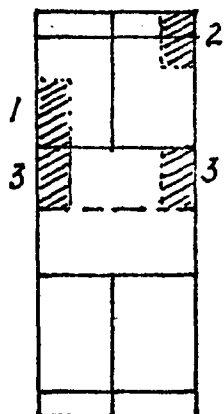
or

Pretend to take a full swing to do a drive and suddenly block the shot for a drop shot to either side. (3)

CRITERIA TEST FRAME 100

TASK

(__ out of 10)



Have your partner hit 10 drive services to your backhand and you alternate your returns with around-the-head drive back or a drop to either sideline. Try to hit 5 out of 10 to the green target areas. If you are unsuccessful repeat the exercise but no more than 3 times.

Follow a 1-2-3 sequence in clockwise fashion.

Record scores on your answer sheet.

PROGRAM 101

DOUBLES
 DECEPTION ON ALL TYPES OF DOUBLES SERVICES

Objective

The student should be able to show deception in his doubles service by demonstrating the same preparatory backswing for the short, drive, flick, and long services to the satisfaction of your partner.

1. Your opponent should not be able to tell which serve is coming until the shuttle is actually contacted.

Take the SAME stance for every type of service and do NOT look at the SPOT to which you want to serve. Look at your OPPONENT'S EYES instead.

True

At the eyes of your opponent

2. True or false:

You should take the same stance for every serve.

Where should you look when you serve. _____

PROGRAM 101 (continued)

DOUBLES
DECEPTION ON ALL TYPES OF DOUBLES SERVICES

CRITERIA TEST FRAME 101

(Successful or Unsuccessful)

Did your partner think you
were successful in your
deception?

Yes ___ No ___

With your partner standing in the ready position to receive in doubles, alternately serve from the right and left service courts the variety of services that are available to you, (short, flick, drive, and long) with the same backswing. You should serve 4 or 5 of the same services in a row until you feel you are effective with that serve.

Your partner should stand with his racket extended and attempt to return each of your services in the most effective way.

Your partner should tell you if you were deceptive or not.

Record on your answer sheet.

PROGRAM 102 (Requires Court Space)

DECEPTION
OVERHEAD DROP SHOTS, SMASHES, AND CLEARS

Objective

The student must be able to demonstrate the same backswing for the overhead drop shot as for the smash and clear by alternating the return of each high serve to the green target areas 5 out of 10 times.

1. Your deception must be so good that your opponent will not know what shot you are going to hit until the shuttle is actually coming his way.
-

2. Start out by hitting a few smashes and deep clears with the same backswing for each. Gradually ease up on the amount of power you need to hit the shuttle for a drop shot. Keep easing up on the amount of wrist imparted until the shuttle glides over and close to the net.
-

PROGRAM 102 (continued)

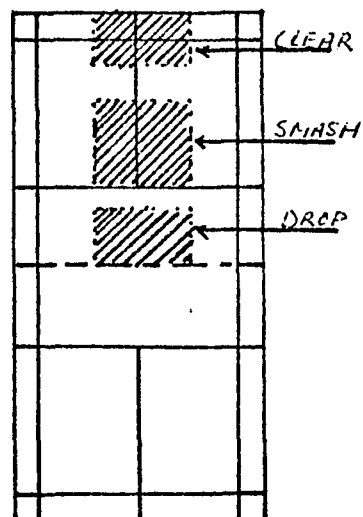
DECEPTION
OVERHEAD DROP SHOTS, SMASHES, AND CLEARS

CRITERIA TEST FRAME 102

TASK

(_ out of 10)

Have your partner set up underhand high clears and at the same time subjectively rate you to see if your backswing preparation is the same for every stroke. Alternately hit clears, smashes, and drop shots with the same preparatory backswing. Try to get 5 out of 10 in the general court areas along with adequate deception. If you are unsuccessful, repeat the exercise but no more than 3 times. Record on answer sheet.



PROGRAM 103 (Requires Court Space)

DECEPTION
CHEST HIGH DROP SHOTS, DRIVES, AND
OFFENSIVE CLEARS

Objective

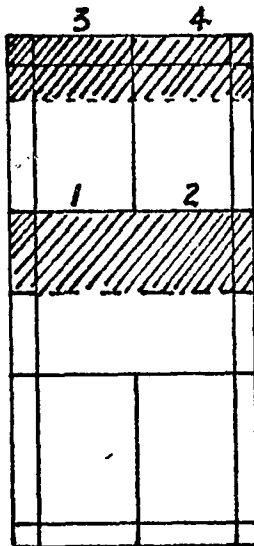
The student must be able to alternately hit chest high drop shots with a drive or clear 5 out of 10 times and have the same preparatory backswing for each.

1. On drop shots hit from chest height the deception must be like that of a drive or a clear. Putting a small loop into your backswing gives good deception and added wrist strength.

CRITERIA TEST FRAME 103

TASK

(__ out of 10)



Have your partner set up chest high shots to you from an underhand position. You are to alternately hit chest high drop shots, drives or offensive clears using the same backswing for each shot. Through experimentation figure out what is the most effective method for you. Hit drops to area 1 and 2. Hit drives and clears to areas 3 and 4. Attempt to be successful 5 out of 10 times. If you are unsuccessful, repeat the exercise but no more than 3 times.

Record scores on your answer sheet.

PROGRAM 104 (Requires Court Space)

DECEPTION
KNEE HIGH DROP SHOTS AND UNDERHAND CLEARS

Objective

The student must be able to alternately hit knee high drop shots with underhand clears using the same deceptive back-swing 5 out of 10 times.

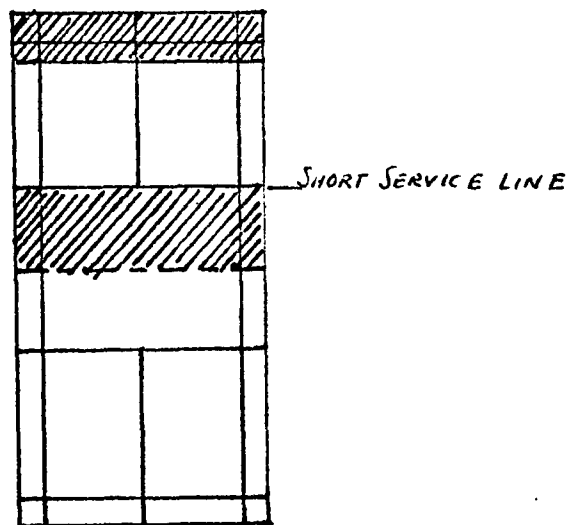
CRITERIA TEST FRAME 104

TASK

(__ out of 10)

Have your partner set up knee high drop shots from an underhand position that drop between the net and the short service line while you are waiting in home position. Alternately hit knee high drop shots and underhand clears to the green target areas designated on the diagram. Try to be successful 5 out of 10 times. If you are unsuccessful, repeat the exercise but no more than 3 times.

Record on answer sheet.



APPENDIX C
PROGRAMMED INSTRUCTION ANSWER SHEET

APPENDIX C

PROGRAMMED INSTRUCTION ANSWER SHEET

NAME _____
GYM PD. _____

DAY # _____

MULTIPLE CHOICE

- # a.
 b.
 c.
d.

- # a.
 b.
 c.
d.

COMPLETION

#

#

TASK
____ SUCCESSFUL
____ UNSUCCESSFUL

TASK
____ SUCCESSFUL
____ UNSUCCESSFUL

TIMES IN A ROW

(1) __ x in a row
(2) __ x in a row
(3) __ x in a row

(1) __ x in a row
(2) __ x in a row
(3) __ x in a row

TASK
(1) __ out of 10

(2) __ out of 10

(3) __ out of 10

(1) __ out of 10
(2) __ out of 10
(3) __ out of 10

FOOTWORK SEQUENCES

#30

PICTURE

#

TASKS
Rt. Ct. Lt. Ct.
(1) __ out of 10 __ out of 10
(2) __ out of 10 __ out of 10
(3) __ out of 10 __ out of 10

FOREHAND BACKHAND
(1) __ out of 10 __ out of 10
(2) __ out of 10 __ out of 10
(3) __ out of 10 __ out of 10

WALL VOLLEYS
1 2 3 4 5

APPENDIX D
DIRECTIONS FOR THE MILLER WALL VOLLEY TEST

APPENDIX D

DIRECTIONS FOR THE MILLER WALL VOLLEY TEST

"A Badminton Wall Volley Test"

by

Frances A. Miller (64)

ADMINISTRATION OF THE TEST

Equipment

1. Badminton racket in good condition
2. New Timpe' outdoor shuttlecock (sponge-end)
3. Accurate stop watch
4. Score cards and pencils

Markings

1. Wall--a one inch line extended across the wall 7 feet, 6 inches from the floor and parallel to the floor. The width of the wall space should be at least 10 feet and the height preferably 15 feet or higher.
2. Floor--a straight line 10 feet from the wall extended the length of the wall distance and parallel to the wall.

Addistants Needed

1. Timer (gives the signal, "Ready, Go, and "Stop")
2. Scorer (counts the number of legal hits)
3. Recorder (makes a record of good hits)

Test Directions

The subject should be given opportunity to practice for one minute before the first trial is given. If there is ample wall space, several players can practice at the same time and also can be tested at the same time as there is a 10 foot distance between players. A short rest period of at least 30 seconds should be allowed between trials. Practice should not be allowed between trials.

On the signal, "Ready, Go," the subject serves the shuttlecock in a legal manner against the wall from behind the 10 foot floor line. The serve puts the shuttlecock in a position to be rallied with a clear on each rebound. If the serve hits on or above the 7 foot, 6 inch wall line, that hit counts as one point and each following rebound hit made on or above the 7 foot, 6 inch wall line when the subject is behind the 10 foot floor line counts as one point. The hit is not counted if any part of a foot goes over the 10 foot restraining line. (Due to the fact that a subject encounters difficulty when trying to look at the line on the floor along with watching the shuttlecock, it is suggested that a chalk line three inches back from the 10 foot line be added, and the subject told to stay behind that line if possible. This allows the foot to slide as much as three inches without penalizing the person being tested. Also the scorer should say "Back" whenever the subject consistently goes over the line). The hit is not counted if the shuttlecock goes below the 7 foot, 6 inch wall line. However either in the case of the foot going over the 10 foot line or the shuttlecock hitting below the 7 foot, 6 inch line, the subject is permitted to keep the shuttlecock in play. The shuttlecock may be stopped at any time and restarted with a legal service from behind the 10 foot floor line. If the shuttlecock is missed and falls to the floor, the subject picks up the same shuttlecock as quickly as possible, gets behind the 10 foot floor line, and puts the shuttlecock into play with a legal service.

An accumulative number of hits made within 30 seconds is given to the recorder by the scorer for each individual. When the timer gives the signal "Stop," a total number of hits is given to the recorder. Three 30-second trials are given. Any stroke may be used to keep the shuttlecock in play. A "carried bird" or a double hit is counted as good if the hit eventually goes on or above the 7 foot, 6 inch wall line. The subject may step in front of the 10 foot line in order to keep the shuttlecock in play, but hits failing to follow the specifications given above do not count. The sponge and shuttlecock will bounce if the shuttlecock falls to the floor. The subject does not have to pick up the shuttlecock if he can keep the shuttlecock in play in any other manner. The score consists of the sum of three trials.

APPENDIX E
FORMAT FOR THE CIRCUIT
BADMINTON TOURNAMENT

APPENDIX E

FORMAT FOR THE CIRCUIT
BADMINTON TOURNAMENTThe Organization of the Circuit Tournament:

1. Each student was asked to find a partner that she wanted to play with. They had to play a singles game to see which partner was strongest.
2. The names of the doubles combinations were placed in a hat, drawn out, and placed on a Winners Ladder from top to bottom.
3. For the first day's play the names were taken from the order of the ladder and written on a tournament score sheet so that each person could see what court she was playing on.
4. When the teams were placed on a feeder court the partners played a singles round robin with the other team for four five-minute games or eleven points, whichever came first. The players were made to understand that they were on their own and were trying to get points for themselves as well as trying to win the majority of the four singles games. In case of a two game to two game tie the individual points were added up. If there was still a tie the instructor spun the racket for a "rough or smooth" chance decision. The doubles team that won the majority of the games moved up to the regulation court the next day and the losers moved down.

5. At the end of each timed playing period the scores were given to the instructor. The singles matches were always played first and the doubles matches last. In case of absenteeism on their own court the subjects could play people who were sitting out on the regulation courts when their partners were playing if there was no one else available to play. In the case of very large classes some people placed on feeder courts had to sit out a day or pick up matches when somebody on a court had no one else to play.
6. At the end of the class period the doubles combinations were arranged on a new tournament sheet according to the day's results. Winners (two out of three games) moved up a court and losers down a court. In this type of tournament the stronger teams ended up on the lower numbered courts and the weaker teams on the higher numbered courts.

Rules of Playing Governing the Circuit Badminton Tournament:

1. Doubles teams were assigned by draw to every court including the feeder courts. It was important that the partners of each team had played each other the first day of the tournament for ten minutes to stabilize the individual rankings in the class and to determine the stronger team member. In the singles matches on the tournament sheet the stronger name is always listed first for the doubles

combinations. When meeting opposing teams the stronger opponents would play each other and the weaker opponents each other unless the two teams met a second time at which time they would play the unfamiliar opponent.

2. Time. The singles games were approximately five to six minutes each or a regulation 11-point game, whichever came first. The doubles games were approximately ten minutes in length or fifteen points, whichever came first. "Sudden death," (a one point lead) was played if the score was tied at the sound of the minute minder. If the shuttle was in play when the minute minder rang the point would be played out.
3. Class ranking was computed by the singles showing (total number of points divided by the number of games played.) The doubles match was used only to determine the court level for each day's play and was most important in moving up and down the court's circuit.

Absenteeism or an Uneven Number of People in the Class.

1. In the case of an uneven number of people in the class one person was a floater for an absentee partner. A student who was chronically absent from school was made a "floater." This person could never play with the same person twice unless there was only one absentee in the class. Otherwise she was put on a "feeder court" to play when someone was absent.

2. If a student had to play alone, she played singles against each partner and then played singles against the doubles combination. To equalize the sides she got two services and played the singles lines as boundaries on her side of the court. If she lost both singles games, other free people could play with her since she had lost two out of the three games anyway.
3. If one partner of each team was missing only one singles game was played and the next day's circuit was set on these results. These two players then played other feeder court players to accumulate singles points and games for themselves.
4. If only one player was present out of a foursome, her team won by default and the next day her team advanced a circuit court. She would continue to play singles games just as a feeder court player would do. A player got credit for every singles game played.
5. If one partner out of three was absent on a feeder court, the opponents present would win by default in the round robin and only those games that could be played would be played and the total won-loss results computed for moving up and down.

In this study the instructors never got to use a court for skill teaching purposes because of the large number of students.

APPENDIX F
TOURNAMENT SCORE SHEET FOR FORTY-TWO PLAYERS

APPENDIX F

TOURNAMENT SCORE SHEET FOR FORTY-TWO PLAYERS

42
PlayersPeriod 1
Circuit Ladder Tournament

Day # _____

Circle the Winners

EAST GYM

MIDDLE GYM

Feeder Court
#1Play singles against FC
people if absent.

Ct.	VS	_____	_____
#6	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

Ct.	VS	_____	_____
#1	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

FC			
#5	VS	_____	_____
S			
I	VS	_____	_____
N			
G	VS	_____	_____
L			
E	VS	_____	_____
S			

FC			
#2	VS	_____	_____
S			
I	VS	_____	_____
N			
G	VS	_____	_____
L			
E	VS	_____	_____
S			

Ct.	VS	_____	_____
#5	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

Ct.	VS	_____	_____
#2	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

FC			
#4	VS	_____	_____
S			
I	VS	_____	_____
N			
G	VS	_____	_____
L			
E	VS	_____	_____
S			

FC			
#3	VS	_____	_____
S			
I	VS	_____	_____
N			
G	VS	_____	_____
L			
E	VS	_____	_____
S			

Ct			
#4	VS	_____	_____
	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

Ct.			
#3	VS	_____	_____
	VS	_____	_____
	VS	_____	_____
	Doubles	_____	_____

APPENDIX G
TOURNAMENT SCORE SHEET FOR THIRTY-EIGHT PLAYERS

APPENDIX G

TOURNAMENT SCORE SHEET FOR THIRTY-EIGHT PLAYERS

38
Players

Period 2
Circuit Ladder Tournament

Day # _____

Circle the Winners

EAST GYM

MIDDLE GYM

Ct. _____ VS _____
#6 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#1 _____ VS _____
_____ VS _____
Doubles _____

Feeder Court
#5
vs
Play singles against FC
people if absent

FC
#1 _____ VS _____
S _____
I _____ VS _____
N _____
G _____ VS _____
L _____
E _____ VS _____
S _____

Ct. _____ VS _____
#5 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#2 _____ VS _____
_____ VS _____
Doubles _____

FC
#4 _____ VS _____
S _____ VS _____
I _____
N _____ VS _____
G _____
L _____ VS _____
E _____
S _____

FC
#2 _____ VS _____
S _____ VS _____
I _____
N _____ VS _____
G _____
L _____ VS _____
E _____
S _____

Ct. _____ VS _____
#4 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#3 _____ VS _____
_____ VS _____
Doubles _____

EXTRA MATCHES

_____ VS _____
_____ VS _____

_____ VS _____
_____ VS _____

APPENDIX H
TOURNAMENT SCORE SHEET FOR FORTY-FOUR PLAYERS

APPENDIX H

TOURNAMENT SCORE SHEET FOR FORTY-FOUR PLAYERS

44
Players

Period 3
Circuit Ladder Tournament

Day # _____

Circle the Winner

EAST GYM

MIDDLE GYM

Feeder Court #6

Feeder Court #1

Play singles against
FC people if absent.

Play singles against FC people
if absent.

Ct. _____ VS _____
#6 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#1 _____ VS _____
_____ VS _____
Doubles _____

FC #5 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

FC #2 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

Ct. _____ VS _____
#5 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#2 _____ VS _____
_____ VS _____
Doubles _____

FC #4 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

FC #3 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

EXTRA MATCHES

_____ VS _____
_____ VS _____

_____ VS _____
_____ VS _____

APPENDIX I
TOURNAMENT SCORE SHEET FOR FORTY-EIGHT PLAYERS

APPENDIX I

TOURNAMENT SCORE SHEET FOR FORTY-EIGHT PLAYERS

48
Players

Period 9
Circuit Ladder Tournament

Day # _____

Circle the Winners

EAST GYM

MIDDLE GYM

Feeder Court #6½

Feeder Court #1

Play singles against
FC people if absent.

Play singles against FC
people if absent.

Ct. _____ VS _____
#6 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#1 _____ VS _____
_____ VS _____
Doubles _____

FC _____ VS _____
#6 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

FC _____ VS _____
#2 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

Ct. _____ VS _____
#5 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#2 _____ VS _____
_____ VS _____
Doubles _____

FC _____ VS _____
#5 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

FC _____ VS _____
#3 _____ VS _____
S _____ VS _____
I _____ VS _____
N _____ VS _____
G _____ VS _____
L _____ VS _____
E _____ VS _____
S _____ VS _____

Ct. _____ VS _____
#4 _____ VS _____
_____ VS _____
Doubles _____

Ct. _____ VS _____
#3 _____ VS _____
_____ VS _____
Doubles _____

FC _____
#4 Play singles

FC _____
#3½ Play singles

APPENDIX J

DOUBLES TEAMS ROTATION FOR THE CIRCUIT
LADDER TOURNAMENT

APPENDIX J

DOUBLES TEAMS ROTATION FOR THE CIRCUIT
LADDER TOURNAMENTPeriod 1--42 players

FC #1 to Ct. #1
 Ct. #1 winner stays on Ct. #1
 Ct. #1 loser to FC #2

FC #2 winner to FC #1
 FC #2 loser to Ct. #2

Ct. #2 winner to FC #2
 Ct. #2 loser to FC #3

FC #3 winner to Ct. #2
 FC #3 loser to Ct. #3

Ct. #3 winner to FC #3
 Ct. #3 loser to Ct. #4

Ct. #4 winner to Ct. #3
 Ct. #4 loser to FC #4

FC #4 winner to Ct. #4
 FC #4 loser to Ct. #5

Ct. #5 winner to FC #4
 Ct. #5 loser to FC #5

FC #5 winner to FC #5
 FC #5 loser to Ct. #6

Ct. #6 winner to FC #5
 Ct. #6 loser stays on Ct. #6

Period 2--38 players

Ct. #1 winner stays on Ct. #1
 Ct. #1 loser to FC #2

FC #1 winner to Ct. #1
 FC #1 loser to Ct. #2

Ct. #2 winner to FC #1
 Ct. #2 loser to FC #2

FC #2 winner to Ct. #2
 FC #2 loser to Ct. #3

Period 2--continued

Ct. #3 winner to FC #2
 Ct. #3 loser to Ct. #4

Ct. #4 winner to Ct. #3
 Ct. #4 loser to FC #4

FC #4 winner to Ct. #4
 FC #4 loser to Ct. #5

Ct. #5 winner to FC #4
 Ct. #5 loser to Ct. #6

Ct. #6 winner to FC #5
 Ct. #6 stays on Ct. 6

FC #5 to Ct. #5

Period 3--44 players

FC # 1 to Ct. #1
 Ct. #1 winner stays on
 Ct. #1
 Ct. #1 loser to FC #2

FC #2 winner to FC #1
 FC #2 loser to Ct. #2

Ct. #2 winner to FC #2
 Ct. #2 loser to FC #3

FC #3 winner to Ct. #2
 FC #3 loser to Ct. #3

Ct. #3 winner to FC #3
 Ct. #3 loser to Ct. #4

Ct. #4 winner to Ct. #3
 Ct. #4 loser to FC #4

FC #4 winner to Ct. #4
 FC #4 loser to Ct. #5

APPENDIX J (continued)

DOUBLES TEAMS ROTATION FOR THE CIRCUIT
LADDER TOURNAMENT

Period 3--continued

Ct. #5 winner to Ct. #4
Ct. #5 loser to FC #5

FC #5 winner to Ct. #5
FC #5 loser to Ct. #6

Ct. #6 winner to FC #5
Ct. #6 loser to FC #6
FC #6 to Ct. #6

Period 9--48 players

FC #1 to Ct. #1
Ct. #1 winner stays on Ct. #1
Ct. #1 loser to FC #2

FC #2 winner to FC #1
FC #2 loser to Ct. #2

Ct. #2 winner to FC #2
Ct. #2 loser to FC #3

FC #3 winner to Ct. #2
FC #3 loser to Ct. #3

Ct. #3 winner to FC #3
Ct. #3 loser to FC #3½

FC #3½ to Ct. #4
FC #4 to Ct. #3

Ct. #4 winner to FC #4
Ct. #4 loser to FC #5

FC #5 winner to Ct. #4
FC #5 loser to Ct. #5

Ct. #5 winner to FC #5
Ct. #5 loser to FC #6

FC #6 winner to Ct. #5
FC #6 loser to Ct. #6

Period 9--continued

Ct. #6 winner to FC #6
Ct. #6 loser to FC #6½
FC #6½ to Ct. #6

APPENDIX K
BADMINTON COURSE OUTLINE

APPENDIX K

BADMINTON COURSE OUTLINE

Twenty-six minutes of activity
based on ten to eleven lessons
and twelve days of the Circuit
Ladder Tournament

EXPERIMENTAL

Programmed Instruction

At the beginning of each period the students warmed up by hitting Carlton rubber tipped shuttles against the wall in a prescribed weekly manner to strengthen their wrists and to increase eye-hand coordination. Each will attempt 5 trials of this exercise and record each.

Each student will progress at her own rate and at the end of the class period will turn in an answer sheet of the programs attempted.

Time was provided for game play during each day.

CONTROLLED

Traditional Method

Each student will also do consecutive hits against the wall in the manner prescribed for the experimental class.

The traditional teachers had behavioral objectives too.

Time was provided for game play during each day.

DAILY LESSONS

EXPERIMENTALCONTROLLED

Monday, December 3, 1973

1. Explanation of the study to the total section.
2. Miller Wall Volley Test using sixteen stations in two gymnasiums.

Tuesday, December 4, 1973

1. Miller Wall Volley Test to those who were absent in the total section.
2. Informal play
3. Forehand overhead clears against the wall for five trials.

APPENDIX K (continued)
 BADMINTON COURSE OUTLINE

EXPERIMENTALCONTROLLED

4. Sections were divided into two classes from the rank order of the Miller Wall Volley pre-test.

Wednesday, December 5, 1973

- | | |
|--|--|
| 1. Forehand overhead volleys against the wall for five trials as they came into the class. | 1. Same as Experimental. |
| 2. Start Programmed Instruction Booklet with teacher assistance on answer sheet. | 2. Review of grips, ready position |
| | 3. Footwork: backpedaling and moving sideways. |
| | 4. Putting the shuttle into play using the underhand clear so that they can hit overhead clears. |
| | 5. High serve for singles. |

Thursday, December 6, 1973

- | | |
|--|--|
| 1. Forehand overhead volleys against the wall for five trials as they came into the class. | 1. Same as Experimental |
| 2. Work at own pace and selection of skills with teacher assistance and interaction | 2. Overhead loop and fast drop shots. Practice these in a half-court situation with one partner returning all drops with an underhand clear. |
| | 3. Rotate clockwise practicing clears and drop shots. |

Friday, December 7, 1973

- | | |
|--|------------------------------------|
| 1. Forehand overhead volleys against the wall for five trials as they came into the class. | 1. Same as Experimental. |
| | 2. Doubles low serves and returns. |

APPENDIX K (continued)

BADMINTON COURSE OUTLINE

EXPERIMENTAL

2. Work at own pace and selection of skills with teacher assistance and interaction.
3. Explanation of a side-by-side doubles game with demonstration.
4. Play doubles in "sides" position.

Monday, December 10, 1973

1. Five trials of backhand clears against the wall.
2. Work at own pace and selection of skills with teacher assistance and interaction.
3. Doubles play.

CONTROLLED

3. Ready position in doubles and where you stand.
4. Explanation of "odd and even" courts for doubles play.
5. Doubles play in "sides" position.

Tuesday, December 11, 1973

1. Five trials of backhand clears against the wall.
2. Basic principles of playing doubles taught in each class.
 - a. Low serve--cover the net until the shuttle is cleared.
 - b. Long serve--sides.

1. Same as Experimental.
2. Review doubles short service.
3. Return of low doubles serve.
 - a. underhand drop-straight ahead.
 - b. push shot down-the-line.
 - c. smash
4. Doubles play.

Wednesday, December 12, 1973

1. Five trials of backhand clears against the wall.
2. Work at own pace and selection of skills with teacher assistance and interaction.
3. Half-court singles

1. Same as Experimental
2. The smash
3. Half-court singles

APPENDIX K (continued)
 BADMINTON COURSE OUTLINE

EXPERIMENTALCONTROLLED

Thursday, December 13, 1973

1. Five trials of backhand clears against the wall.
2. Work at own pace and selection of skills with teacher assistance and interaction
3. Doubles play.

1. Same as Experimental.
2. Deception--three strokes from an overhead position. Clear-drop-smash Practice these with a partner.
3. Doubles play.

Friday, December 14, 1973

1. Five trials of backhand clears against the wall.
2. Work at own pace and selection of skills with teacher assistance and interaction.
3. Singles play straight ahead.

1. Same as Experimental.
2. Hairpin and cross-court drop shots.
3. Singles play straight ahead.

Monday, December 17, 1973

1. Five trials of forehand drives against the wall.
2. Work at own pace and selection of skills with teacher assistance and interaction.
3. Picked partners from either half of class for circuit ladder tournament.
4. Played doubles with own half of class.

1. Same as Experimental.
2. Review of all strokes with teacher interaction.
3. Picked partners.
4. Doubles play with own half of class.

APPENDIX K (continued)
BADMINTON COURSE OUTLINE

EXPERIMENTAL

CONTROLLED

Tuesday, December 18, 1973

1. Do the random draw for the Circuit Ladder Tournament and explain how it will be run for each section.
2. Partners play each other for ten minutes to see who is the stronger.
3. Doubles challenges for ten minutes.

Wednesday, December 19, 1973

1. Both instructors hit with students as they came in.
2. First day of the Circuit Ladder Tournament.

Thursday, December 20, 1973

1. Both instructors hit with students as they came in.
2. Second day of the Circuit Ladder Tournament.

Friday, December 21, 1973

1. Last day before a two-week lay-off for vacation.
2. Both instructors hit with students as they came in.
3. Third day of Circuit Ladder Tournament.

Monday, January 7, 1974

1. Both instructors hit with students as they came in.
2. Fourth day of Circuit Ladder Tournament.

Tuesday, January 8, 1974

1. Hit with students.
2. Fifth day of Circuit Ladder Tournament.

APPENDIX K (continued)
BADMINTON COURSE OUTLINE

EXPERIMENTAL

CONTROLLED

Wednesday, January 9, 1974

1. Hit with students.
2. Sixth day of Circuit Ladder Tournament.

Thursday, January 10, 1974

1. Hit with students.
2. Seventh day of Circuit Ladder Tournament.

Friday, January 11, 1974

1. Hit with students.
2. Eighth day of Circuit Ladder Tournament.

Monday, January 14 through Wednesday, January 16, 1974

Final examinations--no gym classes.

Thursday, January 17, 1974

1. Hit with students
2. Ninth day of Circuit Ladder Tournament.

Friday, January 18, 1974

1. Hit with students
2. Tenth day of Circuit Ladder Tournament.

Monday, January 21, 1974

1. Hit with students.
2. Final day of Circuit Ladder Tournament.

APPENDIX K (continued)
BADMINTON COURSE OUTLINE

EXPERIMENTAL

CONTROLLED

Tuesday, January 22, 1974

Miller Wall Volley post-test

Wednesday, January 23, 1974

Challenges and informal play

Thursday, January 24, 1974

Challenges and informal play.

Friday, January 25, 1974

No school--end of semester.

APPENDIX L

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

APPENDIX L

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

Stu. No.	Prev. Units of Exp.	Abs.	Miller Wall Volley		Test Rank	Circuit Pts.	Ladder Rank	
			Pre	Rank				
<u>Period 1</u>								
<u>Programmed</u>								
1	1	3	11.0	22	14.0	22	5.2	17
2	3	0	11.7	18.5	14.7	18.5	6.9	7
3	1	6	15.7	5	19.3	4	8.9	2
4	1	4	13.7	11.5	15.0	16.5	5.1	19.5
5	3	5	16.3	4	15.7	13	7.5	5
6	3	3	18.3	2	23.7	1	9.8	1
7	1	2	12.3	15	18.0	6	8.5	3
8	1	5	12.3	15	16.7	9	5.6	12
9	1	1	10.7	24.5	11.7	30	4.1	26
10	1	4	6.3	33	16.0	11.5	3.8	28
11	0	2	11.3	20	17.0	7.5	5.3	14
12	0	7	7.3	30	7.7	36	3.1	32.5
13	0	4	3.0	36	11.3	33	2.0	37
14	1	4	14.3	8.5	18.7	5	5.0	21.5
15	0	2	7.3	30	13.3	25.5	3.1	32.5
16	0	3	13.7	11.5	17.0	7.5	5.3	14
17	2	6	14.3	8.5	16.0	11.5	2.9	34
18	0	5	9.0	27	12.0	28	2.4	35
<u>Traditional</u>								
1	2	0	7.3	30	11.7	29	5.3	13
2	2	4	19.7	1	19.7	3	7.4	6
3	1	5	13.3	13	15.3	14.5	5.9	10
4	1	1	12.0	17	11.7	29	6.6	9
5	2	1	12.3	15	10.3	34	4.7	22
6	2	4	15.3	6	15.0	16.5	7.6	4
7	1	7	14.0	10	14.3	19	5.2	16
8	0	4	10.7	24.5	14.0	21	3.7	28.5
9	1	3	11.0	22	13.3	24.5	5.0	20.5
10	0	1	5.0	35	12.3	26	5.1	18.5
11	1	5	7.7	28	11.3	32	3.9	26
12	1	4	11.0	22	14.0	21	5.2	16
13	1	7	15.0	7	16.3	10	4.4	23.5
14	0	3	10.0	26	13.7	23	4.4	23.5
15	0	3	6.0	34	7.3	36	2.3	35
16	0	6	7.0	32	11.3	32	3.4	30
17	0	0	11.7	18.5	15.3	14.5	3.7	28.5
18	0	4	17.7	3	21.0	2	6.8	8

APPENDIX L (continued)

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

Stu. No.	Prev. Units of Exp.	Abs.	Miller Wall Volley Test				Circuit Ladder	
			Pre	Rank	Post	Rank	Pts.	Rank
<u>Period 2</u>								
<u>Programmed</u>								
1	1	4	19.0	4	17.7	6.5	6.3	10
2	1	1	12.3	19.5	18.0	5	5.9	12
3	0	0	11.3	22	10.7	27	4.0	26
4	0	1	11.0	23	13.7	18	4.8	18
5	1	1	16.3	9	14.0	16.5	4.2	25
6	1	6	5.3	32	4.3	15	4.6	20
7	0	2	4.7	33	7.0	32.5	1.9	33
8	0	3	7.7	30	12.3	20	4.3	23
9	0	8	9.0	26	15.3	12	3.8	29
10	1	0	15.0	12	12.0	21.5	4.9	16.5
11	1	3	14.3	14	17.3	8	7.8	5
12	0	2	9.3	25	11.0	24.5	4.6	20
13	1	7	8.7	28	10.3	29	4.3	23
14	1	5	12.7	18	11.0	24.5	6.4	8.5
15	1	6	16.7	8	21.7	2	5.1	15
16	5	0	25.0	1	26.7	1	10.8	1
17	0	4	18.7	5	17.0	9.5	5.4	14
18	5	2	14.0	15.5	19.0	4	4.9	16.5
<u>Traditional</u>								
1	3	6	20.7	3	16.3	11	8.3	3
2	2	7	22.3	2	17.0	9.5	6.5	7
3	3	5	8.7	28	10.7	27	4.6	20
4	1	2	14.7	13	14.7	13.5	8.8	2
5	3	4	17.7	7	17.7	6.5	8.2	4
6	1	3	10.0	24	12.7	19	4.3	23
7	1	0	15.7	11	10.7	27	6.4	8.5
8	2	2	13.7	17	7.3	31	3.5	30.5
9	0	1	8.7	28	14.0	16.5	3.9	28
10	1	1	18.0	6	21.0	3	7.3	6
11	1	4	12.3	19.5	12.0	21.5	3.5	30.5
12	1	0	16.0	10	10.0	30	6.2	11
13	0	6	4.0	34	7.0	32.5	1.8	34
14	1	3	14.0	15.5	11.3	23	2.7	32
15	0	0	7.0	31	14.7	13.5	5.6	13
16	1	5	12.0	21	14.3	15	3.9	27

APPENDIX L (continued)

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

Prev.		Abs.	Miller Wall Volley		Test Rank	Circuit Pts.	Ladder Rank	
Stu. No.	Units of Exp.		Pre	Rank				
<u>Period 3</u>								
<u>Programmed</u>								
1	0	1	17.7	5	17.3	17	7.3	11.5
2	0	7	7.3	35.5	18.7	11.5	6.7	17.5
3	0	1	15.0	9.5	14.3	28.5	6.6	19
4	0	1	9.7	29.5	14.3	28.5	5.4	26
5	1	0	14.0	12.5	18.3	13.5	6.9	14
6	0	1	7.0	36	16.0	25.5	4.4	29
7	1	3	8.0	33	9.7	36	1.9	38
8	3	0	21.0	2	21.0	4	10.8	1
9	2	2	11.7	24	10.7	34	8.6	4
10	1	4	12.3	22	17.0	19	5.8	23
11	4	3	14.0	12.5	16.7	21.5	5.5	24.5
12	3	2	13.3	17.5	16.0	25.5	6.9	14
13	4	2	21.3	1	22.0	3	10.5	2
14	1	4	8.3	31.5	7.0	37	1.2	39
15	2	4	17.0	6	18.7	11.5	8.1	6.5
16	0	4	12.7	21	16.3	23.5	6.9	14
17	3	7	15.0	9.5	19.3	8	9.6	3
18	0	6	11.3	26.5	17.0	19	2.8	37
19	1	6	13.3	17.5	16.3	23.5	8.1	6.5
<u>Traditional</u>								
1	0	3	8.3	31.5	12.7	31	6.5	20
2	0	6	3.0	37	12.0	32	3.6	34
3	0	5	16.0	7	11.7	33	3.8	33
4	1	2	11.7	24	14.0	30	3.9	32
5	2	2	11.3	26.5	16.7	21.5	4.0	31
6	0	2	13.0	20	18.3	13.5	5.5	24.5
7	0	6	11.7	24	17.7	15	3.3	35
8	2	4	14.0	12.5	25.0	1	6.7	17.5
9	1	1	14.0	12.5	19.0	10	4.5	28
10	2	1	13.3	17.5	19.3	8	6.0	22
11	5	6	20.0	4	19.3	8	7.6	10
12	1	1	13.3	17.5	17.3	17	7.9	8.5
13	2	5	23	38	24.3	2	8.3	5
14	0	5	9.7	29.5	6.7	38	3.1	36
15	0	6	7.3	35.5	17.0	19	5.0	27
16	1	3	13.7	15	20.0	6	4.3	30
17	0	2	15.7	8	17.3	17	6.8	16
18	1	6	7.7	34	10.0	35	6.3	21
19	4	0	20.3	3	20.3	5	7.3	11.5
20	2	5	11.0	28	15.3	27	7.9	8.5

APPENDIX L (continued)

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

Stu. No.	Prev. Units of Exp.	Abs.	Miller Wall Volley Test		Circuit Pts.	Ladder Rank		
			Pre	Rank			Post	Rank
<u>Period 9</u>								
<u>Programmed</u>								
1	1	5	20.0	4	23.0	1	8.3	5.5
2	0	3	15.3	14	18.0	9.5	6.4	11
3	1	0	22.0	1	18.7	7.0	3.9	38
4	0	6	14.7	17	13.0	33.5	3.6	39
5	0	3	15.3	14	17.0	13.5	4.4	32
6	1	2	12.7	24	13.7	30	4.5	31
7	0	2	0	45	5.0	44	4.1	36.5
8	1	0	14.0	20	13.3	32	3.3	43
9	0	2	5.7	39.5	15.7	19.5	4.7	29
10	0	0	8.7	35	14.3	28	5.1	23.5
11	1	2	10.7	29.5	17.3	11.5	4.2	34.5
12	1	0	8.7	35	11.7	39	5.3	21.5
13	2	1	11.0	28	15.0	24.5	5.6	18.5
14	1	0	13.7	21	15.7	19.5	5.7	16.5
15	1	2	7.3	38	12.7	35	5.3	21.5
16	3	4	4.7	42	12.3	37	4.9	26.5
17	0	7	7.7	37	9.3	43	5.0	25
18	1	8	16.7	9	16.7	15.5	4.9	26.5
19	2	5	10.0	31.5	13.7	30	5.4	20
20	1	1	12.3	25	12.3	37	6.2	13.5
21	3	1	18.0	5.5	21.3	3	8.8	3
22	2	6	15.3	14	15.0	24.5	6.1	15
23	1	2	17.0	8	18.0	9.5	8.0	7

APPENDIX L (continued)

DATA: UNITS OF EXPERIENCE, ABSENCES, MILLER WALL
VOLLEY PRE-TEST, POST-TEST, AND CIRCUIT
LADDER TOURNAMENT SCORES

Stu. No.	Prev. Units of Exp.	Abs.	Miller Wall Volley		Test Post Rank	Circuit Pts.	Ladder Rank	
			Pre	Rank				
Period 9								
<u>Traditional</u>								
1	1	0	15.3	14	21.0	4.5	7.1	9
2	0	3	5.7	39.5	11.0	41	4.1	36.5
3	0	2	9.0	33	13.7	30	5.6	18.5
4	0	1	15.3	14	16.3	17	4.3	33
5	0	1	2.3	44	10.7	42	2.5	45
6	0	3	8.7	35	16.7	15.5	4.2	34.5
7	0	1	5.6	41	12.3	37	3.4	41.5
8	1	5	14.3	18.5	11.3	40	3.4	41.5
9	0	1	13.0	22.5	15.3	21.5	5.1	23.5
10	2	1	18.0	5.5	17.3	11.5	6.2	13.5
11	2	2	13.0	22.5	13.0	33.5	5.7	16.5
12	3	4	11.7	26	16.0	18	6.7	10
13	2	8	16.3	10	15.0	24.5	4.7	29
14	1	0	3.3	43	4.7	45	3.5	40
15	0	6	10.7	29.5	15.3	21.5	6.3	12
16	1	6	21.0	2	21.0	4.5	8.3	5.5
17	1	1	14.3	18.5	18.7	7.0	9.2	1
18	2	5	11.3	27	14.7	27	4.7	29
19	0	4	17.7	7	18.7	7	8.8	3
20	1	6	16.0	11	22.0	2	8.8	3
21	1	7	10.0	31.5	15.0	24.5	2.8	44
22	2	7	20.3	3	17.0	13.5	7.3	8