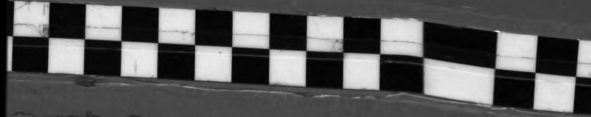
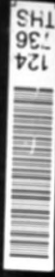


CASE STUDY OF A CONTINUUM  
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SEGMENT OF THE OUTDOOR EXERCISE  
OF THE AMERICAN ALLIANCE FOR  
PHYSICAL EDUCATION AND RECREATION  
1973

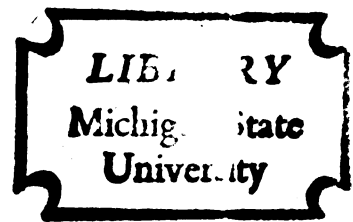
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This is to certify that the

thesis entitled

CASE STUDY OF A CONTINUING EDUCATION PROGRAM  
IN A LEISURE SKILL: THE ARCHERY SEGMENT OF  
THE OUTDOOR EDUCATION PROJECT OF THE AMERICAN  
ALLIANCE FOR HEALTH, PHYSICAL EDUCATION AND  
RECREATION  
presented by

Fred J. Schuette

has been accepted towards fulfillment  
of the requirements for

Ph.D. \_\_\_\_\_ degree in Administration and  
Higher Education

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Date

*June 14, 1943*





## ABSTRACT

### CASE STUDY OF A CONTINUING EDUCATION PROGRAM IN A LEISURE SKILL: THE ARCHERY SEGMENT OF THE OUTDOOR EDUCATION PROJECT OF THE AMERICAN ALLIANCE FOR HEALTH, PHYSICAL EDUCATION AND RECREATION

By

Fred J. Schuette

This study was designed to examine and describe the Outdoor Education Project's workshops for continuing professional education for better instruction in the leisure skill of archery during the developmental period of 1960 through February of 1973.

The data for the study were collected from two sources: personal testimony and written records. The written records were retrieved from the Outdoor Education Project's files. The personal testimony data was retrieved from participants of the Outdoor Education Project's archery workshop.

A questionnaire was sent to participants of the Project's workshops and to balance the subjectivity of the responses to the questionnaire a taped telephone interview was also conducted.

Literature on the development of a continuing education program, principles of learning and the essential elements of an innovative method of instruction were reviewed. From this review a series of thirteen questions were developed serving as a guide in the examination and description of the Project's workshop efforts.

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The data were gathered relating to each of the guiding questions. Two sets of recommendations are also included; the first set is for continuing education programs and the second set of recommendations serves as a guide to life-long learning.

The principal conclusions from the study include:

1. The Outdoor Education Project's archery workshops goals and objectives were established by an Advisory Committee and through a continuous consultation of experts in archery.
2. The archery workshops were promoted by a broad based communication system.
3. The strengths and weaknesses of the archery workshops were evaluated by an advisory committee, by verbal and written evaluations and by the participants and three research studies.
4. A majority of respondents indicated they planned to or had expanded their archery programs to include all or portions of the Project's method of instruction.
5. A majority of the respondents indicated they were better equipped to offer group instruction as a result of the workshop experience.
6. A majority of respondents indicated their programs improved as a result of the workshop experience.

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RECREATION

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Fred J. Schuette

A DISSERTATION

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Michigan State University  
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DOCTOR OF PHILOSOPHY

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1973



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## CHAPTER I

### INTRODUCTION

The age-old dream of man has been for leisure--a chance to let down, to do something he has always wanted to do. He has dreamed of a haven where the winds and waves no longer will beat on his frail craft. There would be happy days, no work to do, no schedule to meet, no struggle. It would be a time to realize a vague, lifelong ambition, to write, to paint a picture, to take a trip to Rio, even to catch that big fish he has dreamed about.<sup>1</sup>

President Garfield said the whole history of humanity could be described as a struggle to answer two questions: One, how do we gain a little leisure from our toil? And two, what do we do with leisure once we get it? Today we're primarily concerned with the second question in the United States.

Historically the worthy use of leisure has been recognized as one of the seven cardinal objectives of education. In a more recent statement by the Educational Policies Commission the constructive use of man's free time is recognized.

The worthy use of leisure is related to the individual's knowledge, understanding, and capacity to choose, from among all the activities to which his time can be devoted, those which contribute to the achievement of his purposes and to the satisfaction of his needs. On these bases, the individual can become aware of the external pressures which compete for his attention, moderate the influence of these pressures, and make wise choices for himself. His recreation, ranging from hobbies to sports to intellectual activity pursued for its own sake, can conform to his own concepts of constructive use of time.<sup>2</sup>

Transition and change characterize the present culture, particularly in the Western World. One of the major changes resulting from the Industrial Revolution and modern technology is the relationship of work and leisure which is affecting the nature of life. There is evidence that for many Americans, a major emphasis upon leisure is replacing the work ethic which for so long has governed life in this and other countries of the Western World.

The impending age of leisure, during this transitional period, is greatly influencing the nature and extent of education. For just as the balance between work and leisure is shifting, the time periods for education are shifting to produce what is being called life long or continuing education. A Task Force on Lifelong Education at Michigan State University in its report to the President identified several forces as greatly influencing the demand for lifelong learning opportunities:

1. Technological advances that are reshaping daily existence;
2. Rising personal expectations and greatly increased leisure time; and
3. The emergence of new individual and group life styles.<sup>3</sup>

Immersed in the individual's life style of today is the pursuit of leisure.

. . . A new age of leisure is almost here. Material needs are satisfied with less and less effort. Marginal chores are getting done with time to spare. The leisure hours just around the corner are uncommitted hours. In the new era, in which men are now potentially freed from the grinding necessities, education becomes an end . . . .<sup>4</sup>

The worthy use of leisure time is a question of major importance in today's society. The ways in which the question is resolved will have a significant impact on the overall quality of life.

Leisure is no longer confined solely to a social and aristocratic elite. Although leisure has always been a fringe benefit in the history of mankind, now it is moving into the center of life, threatening to replace work as the basis of culture. Literally a revolution has occurred--a turning around--for what was on the periphery is now at the heart of man's daily existence.<sup>5</sup>

It is ironic that when the realization of man's dream for leisure is becoming a reality in our country, and when leisure is becoming so significant in our lives, we are not prepared to take advantage of its full potential.

The society which has created the era of leisure has failed largely to prepare people to use it or to provide adequate resources for individual and family pursuits. In a sense, we are in the proverbial dilemma, recreation-wise, "all dressed and no place to go."<sup>6</sup>

It is in this setting that educational institutions must provide continuous opportunities for learning at all age levels, and particularly for adults who are unprepared to make constructive use of the free time which is becoming increasingly available and increasingly important. What is required is continual expansion of knowledge, including the acquisition of skills to meet the needs of the changing times.

For our society to make the best choices concerning their use of leisure time, the adequacy and availability of continuing education programs will have a significant impact. Thus, the need is imperative for a trained cadre of professional leaders who can implement updating skill development programs for both youth and adults.

Information is needed on successful methods of teaching skills to adults and leisure skill leaders, strategies for the implementation of leisure skill programs, and organizational patterns by which leisure skill programs are conducted.

There have been relatively few studies of how adults may be effectively taught leisure-related skills. The intent of this study has been to contribute worthwhile information for the teaching of leisure skills to adults and youth in the hope of providing new choices for society in a changing time. This dissertation describes how adults can be effectively taught a leisure skill, archery. It is a case study of a pioneering project designed to prepare leaders, through continuing professional education, to develop programs and such skill. Hopefully it will contribute to knowledge about leadership development as a part of the diffusion process through a continuing education program.

### The Project Studied

Recognizing the increasing groundswell of all forms of leisure-related pursuits, particularly relating to outdoor sports and skills, the American Alliance for Health, Physical Education, and Recreation in cooperation with Michigan State University initiated, in 1955, a special venture, entitled the Outdoor Education Project. Subsequently, Julian W. Smith was selected as director of the project. The purposes of the project were: the development of leadership in outdoor education; the interpretation of outdoor education; the

implementation of programs in schools and colleges; and the preparation and distribution of instructional materials in outdoor education.

The project has become an outstanding example of cooperation between business, industry, and continuing professional education. It has provided an arena for various agencies and businesses concerned with the outdoors to develop curriculum innovations and professional leadership for outdoor education programs.

A number of workshops have been held throughout the country on both regional and state levels where schools, colleges, and state departments of education have asked for leadership training and program development. In the regional workshops, state teams and key leaders attend. They in turn develop similar leadership training activities in their local communities and states. The Project assists in the workshops by providing consultants, equipment, and other assistance depending on the circumstances.

The workshop programs are extensive and practical, combining instruction and participation in many activities such as casting, archery, shooting, lapidary, and other outdoor activities. The idea of teaching activities of lifelong value for children, youth, and adults is not a new concept in education, but the emphasis on outdoor education programs within the curriculum is a more recent and innovative development.

In addition to the workshops and clinics the Project disseminates information and interprets programs through conventions, conferences, and exhibits. The development of resource materials and



teaching aids in various related outdoor skill areas has assisted those interested in the development of outdoor education programs.

In 1960 the scope of the Outdoor Education Project's outdoor skills was broadened to include archery as one of the major emphases. Initially one manufacturer and a number of archery experts were involved in the development of the archery segment of the Project known as "Operation Archery." In 1966 the American Archery Council became one of the cooperating organizations and through this united effort a large number of archery teachers and recreation leaders have been involved in workshops and clinics. From the Project's efforts new programs have been developed; existing programs have been changed; instructional materials have been prepared and distributed; and archery instruction has been affected.

#### Purpose of the Study

This has been a case study of continuing education for leaders in and for a leisure skill. Its purpose has been to examine and describe the Outdoor Education Project's workshops for developing leaders of instruction in the leisure skill of archery. Three ingredients of a continuing education program were chosen as approaches for the examination of the archery segment of the Outdoor Education Project. The three are: development of program; principles of learning involved; and essential elements of an innovative method of instruction.

A series of questions relating to the three major ingredients were developed from a review of literature in Chapter II. They were

used to facilitate the examination of the content and procedures used in the Outdoor Education Project workshops.

#### Program Planning and Development

1. What were the objectives of the Outdoor Education Project's archery workshops and who established them?

#### Program Operation

2. How were the goals and objectives of the workshops presented to the participants?
3. What methods of communication were employed in promoting the archery workshops?
4. How was learning readiness of the workshop participant taken into account?
5. Were opportunities provided to accommodate differences in the rate of learning?
6. Were incentives provided to motivate the participant?
7. Was the participant able to observe the object and the idea components of the method of instruction?
8. Did the participant have the opportunity to experience feedback?

#### Program Evaluation

9. What evidence indicates that needs were satisfied by this method of instruction?
10. Did the method of instruction lend itself to evaluation by the participant?
11. What advantages of this method of instruction were perceived by the participant?
12. Has the learning affected the participant's behavior as evidenced by his use of his newly acquired knowledge in his program?
13. How were the strengths and weaknesses of the planned workshop programs evaluated by the Project?

### Limitation of the Study

The study has been limited in the time frame of 1960, the birth of the archery segment of the Outdoor Education Project, to February 28, 1973. This was the last date of an archery workshop prior to the mailing of the questionnaire. No attempt has been made to extend the study beyond that date although the project continues to function at the present time and its basic premise and procedures remain essentially the same as those earlier in time.

The writer has had a long and close association with the Outdoor Education Project and the archery segment. This has obviously represented a potential source of bias. However, it is believed that an important off-setting effect of that association has been a potential for greater insight and acceptability during the investigation. A survey of workshop participants and an examination of the archery segment's records have combined with the author's own intimate acquaintance with the Project as principal sources of data for addressing the purpose of the study.

The mailed questionnaire survey and follow-up telephone interview which have contributed the major portion of the research data, were conducted in an effort to determine the influence of the method of instruction on the participants who attended the Project's archery workshops from 1969 to February of 1973. Neither the questionnaire nor other efforts of the study have been concerned with any other Project activities, including the Project clinics which are mentioned briefly in a later discussion.

The examination of the Project's records was conducted in an effort to find how the archery program was planned and developed. The writer's own acquaintance with the Project and the archery segment development provides an insight for investigating important factors.

### Definition of Terms

Leisure as referred to in this dissertation means activities of one's own choosing which he indulges in during his free time as contrasted to activities required by conditions of his profession or other employment.

Continuing education, defined appropriately for this study by Coolie Verner, is:

. . . a relationship between an educational agent and a learner in which the agent selects, arranges, and continuously directs a sequence of progressive tasks that provide systematic experience to achieve learning for those whose participation in such activities is subsidiary and supplemental to a primary productive role in society.<sup>7</sup>

Workshops as used in the text of the study:

. . . bring together individuals with a common interest and background to engage in educational experiences, attitudes, and skills as they develop plans and programs of common interest. Consulting experts are used but the primary burden of providing learning experiences is borne by the participants. General sessions and face to face discussion groups are used.<sup>8</sup>

In addition the workshops, as they have been implemented, have been intensive, participation oriented, and of short duration, i.e., two to three days in length.

Leadership development is viewed as the process through which persons responsible for conducting programs for their respective agencies develop requisite knowledge for leadership

through continuing education programs designed for the acquisition of learning principles, methods and techniques of teaching special subject matter and other content appropriate to the "students" and the agencies' programs.

Innovation has been defined by Rogers as "an idea, practice, or object perceived as new by an individual."<sup>9</sup>

### Overview of the Dissertation

Chapter I has presented a rationale concerning the relationship between leisure and lifelong learning together with the role of continuing professional education in the worthy use of leisure time. It has also described the nature and purposes of the study, identified certain limitations and provided definitions for especially significant terms.

Chapter II presents a review of literature related to relevant learning principles, the development of continuing education programs and a framework for examining the elements of an innovation.

Chapter III presents the methodology of this historical descriptive case study. It describes the research procedures employed in the collection and analysis of data.

Chapter IV presents a general historical description of the Outdoor Education Project and subsequently the history of the archery segment, the procedures in the organization of the archery workshops, the basic data for program planning and operation and operant learning principles.

Chapter V presents data from the questionnaires and the telephone interviews with the writer's interpretation of the findings as they relate to specified learning principles and elements of an innovation.

Chapter VI provides a summary, conclusions, generalizations, recommendations, and suggestions for further study.

FOOTNOTES: CHAPTER I

<sup>1</sup>Jay B. Nash, Philosophy of Recreation and Leisure (Dubuque, Iowa: Wm. C. Brown, Publishers, 1960), p. 20.

<sup>2</sup>Educational Policies Commission, The Central Purpose of American Education (Washington, D.C.: National Education Association, 1961).

<sup>3</sup>President's Task Force on Lifelong Education, The Lifelong University: A Report to the President (East Lansing: Michigan State University, 1973), p. 1.

<sup>4</sup>Theodore J. Shannon and Clarence A. Schoenfeld, University Extension (New York: The Center for Applied Research in Education, Inc., 1965), p. 104.

<sup>5</sup>Robert Lee, Religion and Leisure in America: A Study in Four Dimensions (Nashville, Tenn.: Abingdon Press, 1964), p. 19.

<sup>6</sup>Julian W. Smith, "Recreation for Young America," Transactions of the Twenty-Seventh North American Wildlife and Natural Resources Conference (Washington, D.C.: Wildlife Management Institute, 1962), p. 20.

<sup>7</sup>Coolie Verner as quoted in Handbook of Adult Education, ed. by Robert M. Smith, George F. Aker, and J. R. Kidd (New York: The Macmillan Company, 1970), pp. 49-50.

<sup>8</sup>Jack London, "Program Development in Adult Education," in Handbook of Adult Education in the United States, ed. by Malcolm S. Knowles (Washington, D.C.: Adult Education of the U.S.A., 1960), p. 70.

<sup>9</sup>Everett M. Rogers and F. Floyd Shoemaker, Communications of Innovations: A Cross-Cultural Approach (New York: The Free Press, 1971), p. 19.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

In order to identify the basic premises of the Outdoor Education Project's archery workshops and the method of instruction the literature was reviewed in three areas: program development for continuing education; selected principles of learning; and elements appropriate to analytical study of innovation.

Continuing education has become an increasingly significant segment of our present day educational system. Projections for 1974 indicate that "There will be more adults attending some type of training program than young people in the formal system."<sup>1</sup> Gilford, in early 1974, confirms those projections:

Adult education is not a trivial sector of American education. In 1971-72 there were 15,734,000 individual adult education participants, nearly double the number of college students enrolled for degree credit (opening Fall enrollment was 8,116,000), and 600,000 more than the number of high school students enrolled in grades 9 to 12 (Fall enrollment was 15,116,000).<sup>2</sup>

This vast number of adults who are seeking a variety of learning experiences fall into one or some combination of three classifications according to Cyril O. Houle: ". . . (1) the goal oriented; (2) the learning oriented; and (3) the activity oriented."<sup>3</sup>



The goal oriented individual has a specific skill or knowledge he wishes to master, as in the case of teachers who attempt to maintain current knowledge of their chosen profession. The learning oriented person is interested in learning and self-fulfillment for its own sake. The activity oriented individual is interested in activities because they provide the opportunity for meeting and being with people.

The specific needs of the prospective adult learners must be recognized, planned for, and satisfied. To do that requires a plan or coordinated effort.

#### Development of a Continuing Education Program

The planning process in the development of a continuing education program should be a cooperative effort among the sponsoring agency, clientele, and resource personnel. The program may be viewed as a single entity or a series of activities that sequentially make up a planned program.

All things considered, systematic and continuing study of the community by the educator in cooperation with representative citizens is the best means yet devised for identifying educational needs and planning socially useful adult education programs in a community.<sup>4</sup>

The step by step planning of the program should include:

(1) selection of a committee for developing the program in steps two through five; (2) determining needs and interests of the target population; (3) developing educational objectives; (4) developing the educational experiences that will be most appropriate in meeting the educational objectives; and (5) establishing a method for program evaluation.

## 1. Selection of the Program Development Committee

To be viable the program cannot be developed and implemented by personnel isolated from the clientele it purports to serve. A committee should be developed in cooperation with those agencies, organizations, businesses, and industries that would be affected by the program.<sup>5</sup>

In identifying critical factors that effect the continuing education programs of universities Shannon and Schoenfeld list the importance of "Viable communication to and from, and working relationship with, individual students, clientele groups, and sister agencies."<sup>6</sup>

Tyler recommends the formation of a separate planning committee, in cooperation with faculty and lay groups, to carry out feasibility studies, determine educational goals, gather appropriate resources, identify the clientele, plan the learning experiences, and evaluate the program.<sup>7</sup>

A similar stance is taken by Sheats, Jayne, and Spence who recommend working with a planning committee in the development of the program.<sup>8</sup>

## 2. Determining Needs and Interests of the Target Population

. . . A need represents an imbalance, a lack of adjustment or a gap between a present situation or state of being and a new or changed set of conditions assumed to be more desirable . . . .

This interpretation provides a framework which can be useful in the development of adult education programs. In utilizing this framework it is necessary to be able to compare what is (the present situation) with what should be--the more desirable condition.<sup>9</sup>

The responsibility of determining the needs of the population to be served ultimately rests with the administrator in charge of the program. The foundation upon which needs are based should include knowledge of the clientele, the social setting in which they are based, and the proposed subject matter.<sup>10</sup> This information can be secured through interviews, informal conversations, meeting census, individual questionnaires, and other data gathering devices.

On the other hand, if the program is limited to needs recognized by adults, it is likely to remain underdeveloped or grow too slowly. The director who tries everything under the sun without adequately determining need, however, will undoubtedly waste considerable time and money. To avoid these two extremes, the director must understand not only the needs felt by adults but those which they may not recognize. This skill comes best with experience, although the study of methods used by successful directors give important clues.<sup>11</sup>

The program is ultimately based upon what the sources of information have provided about the present status of the clientele. The next step is determining what the programs should contribute in changing the status of the clientele by establishing a set of educational objectives.

### 3. Developing Educational Objectives

It is important during the development of the educational objectives to distinguish between the broad statements and the specific outcomes of the program or project. The broad statements should reflect the scope of the educational institution. The specific educational objectives are the statements made as to what the individual is to achieve or experience when participating in the program.

The establishment of the program's specific objectives should reflect the type of behavioral change that is contemplated. There are three types of behavior and they should be understood by those developing the specific objectives.

Learning consists of changes in the cognitive, psychomotor, and affective behaviors of an individual. Cognitive behaviors include thinking, reasoning, solving problems, remembering, learning concepts or principles; and using concepts or principles to understand new experience(s). Psychomotor behaviors include all muscular activity such as walking, handwriting, typewriting, athletics, and speech. Affective behaviors include attitude, emotions, values, interest, and motives . . . .<sup>12</sup>

The development of the program will be enhanced by the understanding of behavioral change which is desired as the result of learning.

The quality of judgements made about these matters has lasting impact upon the overall effectiveness of the educational program; the preciseness with which objectives are determined often affects the degree to which programs are effective in bringing about desired behavioral change.<sup>13</sup>

#### 4. Developing the Educational Experiences That Will be Most Appropriate in Meeting the Educational Objectives

By the careful consideration of the specific objectives that have been developed, a clear instructional plan must be established to meet those objectives. An understanding of how an individual learns, reviewed later in this chapter, is an essential element.

DeCecco recognizes three elements that are essential for learning to take place: ". . . the learner, the stimulus or stimulus situation, and the response."<sup>14</sup>

The desired responses are generally the stated objectives of the program and the learners constitute the target population. The stimulus or stimulus situation becomes the focal point in instruction if it is to meet the educational objectives. Consequently, the learning experiences that will best meet and continue to meet these objectives need to be devised. To facilitate the learning process the experiences should be designed to actively involve the learner.

It is not enough to insist upon the necessity of experience, nor even of activity in experience. Everything depends upon the quality of the experience which is had . . . . The effect of an experience is not borne on its face. It sets a problem to the educator. It is his business to arrange from the kind of experiences which, while they do not repel the student, but rather engage his activities are nevertheless, more than immediately enjoyable since they promote having desirable future experiences.<sup>15</sup>

Two elements should be considered in the design of the experiences: the type of meeting or program and the method of instruction that is to be employed. The type of meeting is influenced by the subject, the specific objectives to be covered and the target population to be reached. Morgan and others list the following types of programs or meetings that may be considered: institutes, conventions, conferences, workshops, seminars, short courses, lecture series, formal classes, and open discussion.<sup>16</sup>

In the same vein Neff lists a number of instructional methods that are employed by adult educators to facilitate learning: discussion, lecture, buzz groups, forum, film forum, debate, panel, symposium, brainstorming, circular response, and demonstration.<sup>17</sup>

Careful selection and use of resource materials and audio-visual aids should be considered, where appropriate.

Used as means, rather than ends in themselves, these innovations can free the educator from his traditional role of information giving to that of designer of the learning environment. This requires that the educator have at his disposal a variety of supportive services, supplies and materials to be used as instructional resources.<sup>18</sup>

A special effort should be made to provide the proper physical setting for the program; its selection should be on the basis of its contribution to the entire learning process.

To augment the physical setting the teacher should be cognizant of the proper learning atmosphere. Combs and Snygg emphasize the importance of providing an atmosphere conducive to learning, fostered through the sincerity and integrity of the teacher by acceptance, friendliness, and warmth shown to the learner.<sup>19</sup> Neff stresses such a learning environment when he states, "The teacher's attitude, acceptance, and respect for personality will be contagious. Every effort should be made at all times, to avoid any embarrassment on the part of the student."<sup>20</sup>

##### 5. Establishing a Method for Program Evaluation

The basic purpose of program evaluation is to improve the program. The evaluation should determine if the specific educational objectives are being attained as formulated in the program by considering the following:

. . . (1) clear, concise objectives or statements of intended educational ends to be attained; (2) bench mark or pre-program measures of the behavior(s) or behavioral patterns of the learner prior to his exposure to the educational program; and (3) measures of the behavioral patterns of the learner after completion of the educational program.<sup>21</sup>

There are basically three forms of evaluation based on their degree of precision: formal, informal, and semi-formal.

Informal evaluation is done, as the term implies, on an informal basis through the teacher, informal testing and talking with learners, observation of behavioral changes on the part of the learner outside the instructional setting and advice of other instructors or supervisors.

Formal evaluation is the most precise and exacting type of evaluation. It uses science-based procedures and instruments to gather data and often uses sophisticated procedures in analyzing and interpreting the data pertinent to the study. Such an undertaking will usually require a specialist in educational research to assist the average teacher. It is usually the most productive and likely to be the most expensive form of program evaluation.

Semi-formal evaluations are the middle-of-the-road methods used to gather and interpret information for program improvement. The methods employed can be used by the teacher to evaluate:

. . . the quality of his teaching and the achievement of his students. Much of the evidence in semi-formal evaluation comes from these sources: (1) reliable and valid tests, (2) surveys to determine changes in practice, (3) objective scales and rating sheets, and (4) the judgement of experts.<sup>22</sup>

It will be important to the educator evaluating the program to consider several basic criteria. First, the gathering of data should provide evidence of the program's performance relative to goals. Second, the benefits of the evaluation should be worth the cost of the evaluation. Third, the frequency of the evaluation depends on what is being evaluated and the use of the evidence

gathered. Fourth, the data gathered should provide information for internal consideration for improvement of the program. Fifth, those who are to be affected by the evaluation should be involved in the process. Sixth, the objectivity of the evaluation may require outside help to remove personal bias. Seventh, a set of standards should be secured or established as a norm against which to compare the information gathered. Eighth, the information gathered should provide evidence of the behavioral outcomes. Ninth, the evaluation should assess the value of the program and commitment to it.

Learning principles as a necessary part of instructional design is the second of the three areas to be considered in this review.

### Learning Principles

The learner responds to experiences as a unit. Each experience tends to modify the individual's cognitive, psychomotor, and affective behavior. The meanings the learner draws from his experiences influence his subsequent behavior. To assist those responsible for the learning environment and for achieving the goals of the educational program certain basic principles of learning need to be understood and applied.

In 1964 a set of learning principles were selected by the State Superintendent of Public Instruction in Wisconsin as a guide for educators.<sup>23</sup> In considering these principles views were included from various writers in the field of learning.



1. Learning is governed by the readiness of the learner.

Readiness as used in this context includes entering behavior or " . . . the present knowledge of a particular student in relation to some future status his teacher wants him to attain."<sup>24</sup>

Kelley and Rasey define readiness to include primarily attitude, habit and information possessed by the learner at the time of a new experience or encounter, thus acknowledging the diversity of individuals within a given setting.

The possibility of modification of these controlling structures is what makes growth possible throughout life. Attitude and habit are sometimes so strongly built that they are hard to change, but there is none so strong that it will not yield to certain perceptive experiences.<sup>25</sup>

The status of adults in a given situation, each with a different background of attitude, habit, and information thus present a very wide range of readiness which may, for some, contribute to a constraint upon learning.

But adult education, by its nature, deals much of the time with changing behavior patterns which are already organized and habitual. To say that a major condition for learning is that the student recognize the inadequacy of his present behavior is to put in particular and concrete form the problem of motivation for this kind of learning. The major resistance to change in this context is the defensiveness aroused on behalf of already established behaviors, and the fundamental requirement for success is the provision of sufficient security for the student to permit him to relax his defensive posture.<sup>26</sup>

This rather typical feature of groups of adult learners may have contributed to the conclusion by Edward L. Thorndike in his subsidiary laws of learning, that learning is guided by the person's set or attitude, both his cultural and his momentary one. Those factors

also determine both what he will prefer to do and if a given experience will satisfy or annoy him.<sup>27</sup>

The introduction of a new experience to a group of adults with a wide variety in scope and depth of previous experiences must be carefully organized and presented to facilitate individual learning.

2. Intent to learn is necessary for purposeful learning.<sup>28</sup>

Motivational factors determine the learner's desire to seek knowledge and skills. These include the needs to satisfy biological, social, or emotional deficiencies. The knowledge of an attainable goal encourages perseverance but failure or the past experience of failure may contribute to hesitancy in attempting a new experience.

Doll listed a number of motivational factors contributing to learning:

. . . relevant motives include both general and specific ones; for example, desire to learn, need for achievement (general), desire for a reward or for avoidance of a threatened punishment (specific). Motivation that is too intense (especially pain, fear, and anxiety) may be accompanied by distracting emotional states. . . . Reward is usually preferable to learning under punishment. Correspondingly, learning motivated by success is preferable to learning motivated by failure. . . . Intrinsic motivation is preferable to learning under extrinsic motivation.<sup>29</sup>

Jerome S. Bruner speaks of the need for creating a motivational setting by providing interesting and longer sessions which produce "increased power and understanding if the person is to be encouraged to move to a next episode with zest."<sup>30</sup> Harry L. Miller relates the importance of "togetherness" in learning situations.

The heterogeneity of adult groups and a residential setting has considerable linkage to behavioral change.

Learning is change in behavior, and we tend . . . to resist change. Desirable change becomes more acceptable to us if other individuals who are important to us are willing to accept it at the same time--if the change is group-supported.<sup>31</sup>

The desire for self-fulfillment or self-actualization is one of the five needs in a hierarchy described by Abraham H. Maslow. He states that the need for self-actualization motivates the individual to fulfill his potentialities and to make good use of his abilities and skills. "What man can be, he must."<sup>32</sup> He characterizes self-actualization needs as the highest level of needs and asserts that those pursuing them are basically satisfied people.<sup>33</sup>

Self concept is learned by experiences both in and out of the educational system (life). The real motivational factor that makes the difference, according to Arthur W. Combs, is that "People learn that they are able, not from failure, but from success."<sup>34</sup>

3. A person tends to believe according to how he perceives a situation.<sup>35</sup>

Each person has his own perception of the world because each has a different environment and a different accumulation of previous experiences.

The psychological self . . . continues to grow throughout life . . . . We feed the psychological self through the perceptive process. This is what comes into consciousness when stimuli from the environment impinge on the organism. . . . The quality of the perceptive stuff of growth therefore determines the quality of the behavior of the individual.<sup>36</sup>

Therefore, three important ingredients that must be present to produce a situation that is perceived as a valuable experience are: an early and direct experience that produces an "I can" attitude by the learner, the learner seeing himself as an adequate and effective person, and assisting the learner in a personal search for meaning and to help him discover himself as a person in the given situation.<sup>37</sup>

The goals and objectives to be reached by the learner must be clear, understandable, attainable, and personal.

4. Goals must be clearly in mind and accepted by the learner if adequate learning is to take place.<sup>38</sup>

The need to have a goal that is attainable to the individual, thus commensurate with the learner's individual ability and needs, is important for learning to take place. The learner should be actively involved as his achievement is influenced by his desire to reach his goal.

The goals most helpful in inspiring learning are intrinsic ones, implicit in the learning itself; immediate goals, as opposed to deferred ones; and major goals rather than minor ones.<sup>39</sup>

The learner's perception of self-fulfillment in respect to a given goal is an important factor in the learning process. Combs states that:

The things toward which people aspire will, in the final analysis, depend upon the degree to which they perceive goals as contributing to the maintenance and the enhancement of the self.<sup>40</sup>

## 5. Learning varies with the individual.<sup>41</sup>

Individual differences among learners must be acknowledged by adapting goals to be effective for different individuals. Similarly, alternate goals should be provided within a given situation to help facilitate the choosing and reaching of goals by different individuals. Irving Lorge, in setting principles for satisfying learning experiences for adults, states the importance of recognizing the greater individual differences that exist among adults in comparison to children or youth.<sup>42</sup>

Contributing to the individual rate of learning is the physical environment in which adults have lived. The perceptions of the individual are contributing factors that affect the individual's ability to understand new experiences, for new experiences can only be understood to the extent of the individual's prior knowledge. As Combs and Snygg state, "What is perceived is what we have learned to perceive as a result of our previous experiences."<sup>43</sup> Thus, the learning varies with an individual's past experiences.

Each of the four previously stated learning principles is a contributing factor that affects the learning of the individual. Consequently, the purposeful awareness and inclusion of such principles is required if an educational program is to effectively contribute to the learning of each individual in it. In Perceiving, Behaving, Becoming, the authors, Combs, Kelley, Rogers, and Maslow state:

. . . learning is affected by a positive view of self, by openness to experience, by identification with others, by the student's goals and values and the process of becoming in which he is engaged. They speak, too, of personal feelings, beliefs, attitudes, and of student's meanings about facts.<sup>44</sup>

The authors stress a variety of factors which affect learning but emphasize the fully functioning person, the adequate person, as learning through his whole personality.<sup>45</sup>

DeCecco describes four factors or concepts that influence the rate of learning: readiness, maturation, individual difference and personality.<sup>46</sup> "Learning builds on learning in the way success builds on success. When the foundation blocks are missing, future construction, if possible at all, is a very precarious affair."<sup>47</sup>

6. Learning is useful when a person can retain and apply it to new situations.<sup>48</sup>

The ability to use something that is learned in a new or different situation is the transfer of learning. The retention of what has been learned is the amount of learned material remaining over a period of time. The learner's motivation for learning and his active participation in the process fosters and improves retention. "Meaningfulness influences both learning and retention. The higher the meaningfulness the more rapid the learning and the longer the materials are retained."<sup>49</sup>

The transfer of learning or use of knowledge gained in the classroom to a real life situation is, according to Doll, dependent on the learner's understanding the fundamentals of that knowledge. "Transfer of training, so long argued in American education, seems to proceed best when learners understand the fundamentals of what they are learning and transferring."<sup>50</sup>

7. The kind, the extent, and the validity of evaluation affect present and subsequent learnings.<sup>51</sup>

The learner is influenced by the opportunities he has to evaluate his progress. Evaluation encompasses the individual's recognition of his level of performance, motivation for learning, and readiness to learn. The opportunity for interaction with others in discussion and problem solving contributes to this personal assessment.

The best type or kind of evaluation for a skill, according to DeCecco, is one that involves the student's own evaluation or performance. During the early stages of skill learning external and extrinsic feedback is essential to the learner. As the learner's skill progresses and he becomes more self-reliant the opportunity for intrinsic and internal feedback becomes an important ingredient for better performance.<sup>52</sup>

Feedback not only enhances immediate learning but affects motivation for future learning. The withdrawal of feedback causes such effects as student displeasure, boredom, loss of keenness and tardiness. Feedback is an important factor associated with learning a skill and is perhaps one of the most reliable and universally tested principles of modern psychology. The most effective feedback is immediate and this information is enhanced when preceded by an orientation prior to a performance.<sup>53</sup>

The third of three areas to be considered in determining the basic premises upon which the Outdoor Education Project's

archery workshops reside is the elements considered essential to an innovation.

### Characteristics of an Innovation

The characteristics of an innovation are themselves an important consideration to be accounted for if innovations are to be ultimately adopted by members of a social system. Until recently there had not been an accepted standard classification to describe the characteristics of an innovation. Recognizing this fact and acknowledging that the make up of an innovation affects the reaction to it, Rogers established five "attributes of innovations"<sup>54</sup> which are closely related to their adoption.

#### 1. Relative Advantage

"The relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes."<sup>55</sup> Considerations that would provide the innovation with this attribute would be: cost (both initial and continued), immediacy of reward, low risk, a decrease in discomfort, savings in time and effort, and social approval.

#### 2. Compatibility

"The compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experience, and needs of the receivers."<sup>56</sup> The degree to which this innovation fits a situation and satisfies either a perceived or real need is an essential ingredient to adoption.



### 3. Complexity

"Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use."<sup>57</sup> All innovations fall on a continuum, between simplicity and complexity. Those innovations that are perceived as difficult to understand and master are slow to be adopted. The receiver of an innovation must understand the innovation and be comfortable when using it if it is to be adopted. Part of the work of the instructor is to reduce complex tasks to their more simple components, thus contributing to early feelings of success. "Activities and techniques which result in success and an increased feeling of self-esteem will be repeated; activities which result in failure or humiliation are avoided."<sup>58</sup>

### 4. Trialability

"Trialability is the degree to which an innovation may be experimented with on a limited basis."<sup>59</sup> The opportunity to test new ideas allows the individual an opportunity for trial and evaluation. Innovations that must be accepted or rejected without trial are far less likely to be adopted. The opportunity for firsthand experience with a new idea, affording discussion and experimentation will, assuming that it proves satisfying, enhance adoption.

### 5. Observability

"Observability is the degree to which the results of an innovation are visible to others."<sup>60</sup> Seeing is believing is more than idle conversation, for the acceptance of a new idea is also dependent on the observability of the innovation. The innovation

that lends itself to be more observable, e.g. through demonstrations, tends to be more widely diffused. The preemergent weed killer would be an example of an innovation that does not directly meet the condition of observability.

The acceptance or rejection of an idea or innovation is not an immediate or sudden decision but "occurs over a period of time and consists of a series of actions."<sup>61</sup>

Together with favorable attributes the innovation must be presented to potential adoptors by some type of communication channel. Rogers identifies two such channels: mass media and interpersonal channels.<sup>62</sup> The mass media involves the transmission of ideas without any direct personal contact to a large audience; whereas the interpersonal channel involves a face-to-face communication. These methods may be used to compliment one another. To be most effective the mass media communication should generally precede the interpersonal. "Mass media channels are relatively more important in the persuasion function in the innovation decision process."<sup>63</sup>

The three broad concept areas program development, learning principles and innovation diffusion in continuing education as reviewed in this chapter will provide the basis upon which the Outdoor Education Project's archery workshops will be examined.

In the following chapter the procedures for obtaining and analyzing data are described.

## FOOTNOTES: CHAPTER II

<sup>1</sup>Jack London, "The Social Setting for Adult Education," in Handbook of Adult Education, ed. by Robert M. Smith, George F. Aker, and J. R. Kidd (New York: The Macmillan Co., 1970), p. 11.

<sup>2</sup>Dorothy M. Gilford, "The Non Collegiate Sector: Statistical Snapshots of Adult Continuing Education," Address presented at the 29th National Conference on Higher Education, Chicago, March 11, 1974, p. 1.

<sup>3</sup>Cyril O. Houle, The Inquiring Mind (Madison, Wisconsin: The University Press, 1961), pp. 15-30.

<sup>4</sup>Sammuel E. Hand, "Identification of Needs and Resources," in Administration of Continuing Education, ed. by Nathan C. Shaw (Washington, D.C.: National Association for Public Continuing and Adult Education, 1969), p. 149.

<sup>5</sup>Carl E. Minich, "Major Curriculum Areas and Program Concerns," in Administration of Continuing Education, ed. by Nathan C. Shaw (Washington D.C.: National Association for Public Continuing and Adult Education, 1969), p. 184.

<sup>6</sup>Theodore J. Shannon and Clarence A. Schoenfeld, University Extension (New York: The Center for Applied Research in Education, Inc., 1965), p. 65.

<sup>7</sup>Ralph W. Tyler, "An Evaluation of General Extension in Land Grant Institutions," in Proceedings of the American Association of State Universities and Land Grant Colleges, Vol. II (Kansas City: The Association, 1961), pp. 147-153.

<sup>8</sup>Paul H. Sheats, Clarence D. Jayne, and Ralph B. Spence, Adult Education: The Community Approach (New York: The Dryden Press, 1953), pp. 312-320.

<sup>9</sup>Patrick G. Boyle and Irwin R. Jahns, "Program Development and Evaluation," Handbook of Adult Education, ed. by Robert M. Smith, George F. Aker, and J. R. Kidd (New York: The Macmillan Co., 1970), p. 61.

<sup>10</sup>Ibid., p. 62.

<sup>11</sup>Homer Kempfer, Adult Education (New York: McGraw-Hill Book Company, Inc., 1955), p. 62.

<sup>12</sup>State Superintendent of Public Instruction, Learning Principles (Madison, Wisconsin: Issued by the State Superintendent of Public Instruction, 1964), p. 1.

<sup>13</sup>Patrick G. Boyle and Irwin R. Jahns, "Program Development and Evaluation," Handbook of Adult Education, ed. by Robert M. Smith, George F. Aker, and J. R. Kidd (New York: The Macmillan Co., 1970), p. 65.

<sup>14</sup>John P. DeCecco, The Psychology of Learning and Instruction: Educational Psychology (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1968), p. 246.

<sup>15</sup>John Dewey, Experience and Education (New York: Collier Books, 1963), p. 27.

<sup>16</sup>Barton Morgan, Glenn E. Holmes, and Clarence E. Bundy, Methods in Adult Education (Danville, Ill.: The Interstate Printers and Publishers, 1959), pp. 383-391.

<sup>17</sup>Monroe C. Neff, "Methods and Materials for Adult Learners," in Administration of Continuing Education, ed. by Nathan C. Shaw (Washington, D.C.: National Association for Public Continuing and Adult Education, 1969), pp. 323-331.

<sup>18</sup>Boyle and Jahns, Handbook of Adult Education, p. 69.

<sup>19</sup>Arthur W. Combs and Donald Snygg, Individual Behavior: A Perceptual Approach To Behavior, rev. ed. (New York: Harper and Row, Publishers, 1959), pp. 383-391.

<sup>20</sup>Neff, Administration of Continuing Education, p. 321.

<sup>21</sup>Boyle and Jahns, Handbook of Adult Education, p. 70.

<sup>22</sup>Morgan, Holmes and Bundy, Methods in Adult Education, p. 159.

<sup>23</sup>State Superintendent of Public Instruction, Learning Principles, p. 2.

<sup>24</sup>DeCecco, The Psychology of Learning and Instruction, p. 59.

<sup>25</sup>Earl C. Kelley and Marie I. Rasey, Education and the Nature of Man (New York: Harper and Row, 1952), p. 72.

<sup>26</sup>Harry L. Miller, Teaching and Learning in Adult Education (New York: The Macmillan Co., 1964), p. 42.

<sup>27</sup>Edward L. Thorndike and Arthur I. Gates, Elementary Principles of Education (New York: The Macmillan Co., 1929), p. 87.

<sup>28</sup>State Superintendent of Public Instruction, Learning Principles, p. 2.

<sup>29</sup>Ronald C. Doll, Curriculum Improvement: Decision Making and Process, 2nd ed. (Boston: Allyn and Bacon, Inc., 1971), p. 50.

<sup>30</sup>Jerome S. Bruner, The Process of Education (New York: Random House, Inc., 1960), p. 51.

<sup>31</sup>Miller, Teaching and Learning in Adult Education, p. 126.

<sup>32</sup>Abraham H. Maslow, "A Theory of Human Motivations," in The Self in Growth, Teaching, and Learning, ed. by Don E. Hamachek (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965), p. 257.

<sup>33</sup>Ibid., p. 257.

<sup>34</sup>Association for Supervision and Curriculum Development, Perceiving, Behaving, Becoming (Washington, D.C.: National Education Association, 1962), p. 99.

<sup>35</sup>State Superintendent of Public Instruction, Learning Principles, p. 4.

<sup>36</sup>Association for Supervision and Curriculum Development, Perceiving, Behaving, Becoming, p. 13.

<sup>37</sup>Arthur W. Combs, The Professional Education of Teachers: A Perceptual View of Teacher Preparation (Boston: Allyn and Bacon, Inc., 1965), p. 77.

<sup>38</sup>State Superintendent of Public Instruction, Learning Principles, p. 4.

<sup>39</sup>Doll, Curriculum Improvement, p. 52.

<sup>40</sup>Combs and Snygg, Individual Behavior, p. 111.

<sup>41</sup>State Superintendent of Public Instruction, Learning Principles, p. 5.

<sup>42</sup>Irving Lorge, Howard Y. McCluskey, and Gale E. Jensen, Psychology of Adults (Chicago: Adult Education Association of the U.S.A., 1963), p. 8.

- <sup>43</sup>Combs and Snygg, Individual Behavior, p. 88.
- <sup>44</sup>Association for Supervision and Curriculum Development, Perceiving, Behaving, Becoming, p. 183.
- <sup>45</sup>Ibid., p. 199.
- <sup>46</sup>DeCecco, The Psychology of Learning and Instruction, pp. 61-67.
- <sup>47</sup>Ibid., p. 58.
- <sup>48</sup>State Superintendent of Public Instruction, Learning Principles, p. 6.
- <sup>49</sup>DeCecco, The Psychology of Learning and Instruction, p. 339.
- <sup>50</sup>Doll, Curriculum Improvement, p. 105.
- <sup>51</sup>State Superintendent of Public Instruction, Learning Principles, p. 9.
- <sup>52</sup>DeCecco, The Psychology of Learning and Instruction, p. 318.
- <sup>53</sup>Ibid., pp. 292-295.
- <sup>54</sup>Everett M. Rogers and F. Floyd Shoemaker, Communications of Innovations: A Cross Cultural Approach, 2nd ed. (New York: Free Press, 1971), pp. 135-157.
- <sup>55</sup>Ibid., p. 142.
- <sup>56</sup>Ibid., p. 145.
- <sup>57</sup>Ibid., p. 154.
- <sup>58</sup>Combs and Snygg, Individual Behavior, p. 381.
- <sup>59</sup>Rogers, Communications of Innovations, p. 155.
- <sup>60</sup>Ibid., p. 155.
- <sup>61</sup>Ibid., p. 100.
- <sup>62</sup>Ibid., p. 252.
- <sup>63</sup>Ibid., p. 255.

## CHAPTER III

### METHODOLOGY

This study was designed to examine and describe the Outdoor Education Project's workshops for continuing professional education for better instruction in the leisure skill of archery during the developmental period of 1960 through February of 1973 inclusive. It has had three components: the development of this continuing education program, the principles of learning involved and the characteristics of the innovative method of instruction.

Chapter II presented a review of literature especially relevant to these major components. This chapter describes how the questions in each of these areas have been examined.

#### Sources of Data

The data used in this study came from several sources and they can be classified in two divisions: personal testimony and written records.

The personal testimony has been obtained from participants in the archery workshops and selected leaders in the field of education and recreation who have attended workshops and were certified by the American Archery Council (AAC) between 1969 and February 1973. They have supplied assessments of the Project's method of instruction

and evidence of the inclusion or non-inclusion of the method within their programs.

The written records have been drawn from the office files of the Outdoor Education Project at Michigan State University. They have consisted principally of advisory committee agendas and meeting reports, progress reports to the cooperating archery industry organizations, correspondence with other agencies and individuals not directly connected with the Outdoor Education Project, articles submitted to periodicals, pilot program reports, correspondence from participants in the workshops to the Outdoor Education Project, the instructional manual, workshop agendas and correspondence from key persons and groups who were involved in the archery segment of the Outdoor Education Project.

#### Procedures for Data Collection

Data were collected from the workshop participants and leaders in the field through a mailed questionnaire and telephone interviews.

Data were collected from written records by a thorough examination of the following documents, correspondence, instructional materials, reports and other publications:

1. Planning proposal to Shakespeare Company
2. Program submitted to Advisory Committee (Fitness U.S.A.-- Operation Archery)
3. Yearly progress reports of the Outdoor Education Project
4. Proceedings of the Archery Advisory Committee
5. Six-year progress report by the Outdoor Education Project on the archery segment



6. Planning proposal to the American Archery Council
7. Correspondence from Advisory Committee members
8. Project correspondence to "Pilot Programs"
9. Archery materials distributed to workshop participants
10. Planning meetings of committees
11. Archery manual developed by the Outdoor Education Project
12. Correspondence from workshop participants
13. Correspondence from workshop instructors
14. Survey reports
15. Workshop evaluations
16. Research on "Reliability and Prediction of Archery Achievement"
17. Published books and periodicals.

The questionnaire was sent to all participants who had attended archery workshops sponsored by the Outdoor Education Project and certified as AAC Instructor from 1969 to February of 1973. It was designed to gather information from the participants about their attitudes toward the archery workshops and the method of instruction, knowledge they had acquired, and about their application of that knowledge in their own programs. The questionnaire was developed with the aid of the Director of the Outdoor Education Project and a research specialist. (A copy can be found in Appendix A.) A covering letter accompanied each questionnaire asking for the participant's cooperation in filling out the questionnaire (see Appendix B). Responses to the questions provided data for answering the research questions on characteristics of the innovative method of instruction

and the effect on the participant's behavior as a result of the workshop experience. Questions one through four requested information about the archery experiences and professional status of the participants. Question five elicited information concerning further archery involvement. Questions six through eight requested reports by the respondent of behavioral changes they attributed to the workshops. Questions nine and ten requested evaluation and recommendations for change in the method of instruction. Question eleven inquired about types of equipment used by respondents in their archery programs.

The use of the questionnaire in making a survey was assumed to be the most logical method of retrieving the needed data from a relatively large population.

Survey research is probably best adapted to obtaining personal and social facts, beliefs, and attitudes.<sup>1</sup>

Telephone interviews were conducted with selected personnel who were acquainted with the project and knowledgeable about its purposes and outcomes. The interviews were conducted to balance a recognized weakness in surveys (viz., the subjectivity of the respondent). Those selected for the telephone interviews were chosen because of their personal knowledge of the efforts of the Outdoor Education Project in archery instruction, their professional positions, their knowledge of current status and any changes in archery programs, and their competence to judge relationships between training programs and changes desired. Consequently, this step was taken in an effort to cross-validate the data received from the questionnaires. Eight questions were asked in the telephone

interview (see Appendix C). Questions one and two established the individual's professional position and the setting in which they had observed the Project's method of archery instruction. Questions three through eight were the same questions as six through eleven on the mailed questionnaire.

A review of the Outdoor Education Project's files on the archery segment of the Outdoor Education Project was made to study the rationale of the program, to trace its development in a chronological sequence, to identify the learning principles adopted, and to reveal the process of program planning and development.

The various forms of data were then analyzed in an attempt to answer the questions posed in Chapter I.

#### Procedures for Analysis of Data

The data were analyzed and reported as they related to the questions. They provided the basis upon which the chronology and findings are presented in Chapters IV and V.

Every attempt was made to discover the facts, goals and evaluations of the archery segment of the Project's development and its impact on the participants.

Data analyses were accomplished by using the questions (in Chapter I) as a guide during the systematic investigation of the Project files. The questions were focused upon separately, not as a group. The data were examined with attention to their chronological order in the time period under study. This was done to ascertain possible differences in the appearance of evidence of the various questions over the complete time span from 1960 to February 1973.

Chapter IV presents findings from analysis of data in the Project files. It is in the form of a brief history of the Outdoor Education Project and its archery segment, the development of archery workshops, the methods and materials developed in conjunction with the workshops, research conducted on the archery segment and the significant elements of the method of instruction. A copy of the Manual appears in Appendix G.

Equal weight was put upon unofficial and official written materials.

The respondents were divided into two groups: (1) those who had prior archery instruction, (2) those who did not have prior archery instruction, in order to see if there was reluctance on the part of those individuals who had prior archery instruction to accept the new method of instruction. The groups' responses are presented in tabular form in Chapter V. In an attempt to determine the effect of time between the participants' attendance at a Project workshop and answering the questionnaire, the responses were also compared with elapsed time. These results are presented in Chapter V also in tabular form. The results of the telephone countercheck are presented as an agreement-disagreement dichotomy relative to the participants' answers to relevant questions on the questionnaire.

FOOTNOTES: CHAPTER III

<sup>1</sup>Fred N. Kerlinger, Foundations of Behavioral Research: Educational and Psychological Inquiry (New York: Holt, Rinehart, and Winston, Inc., 1964), p. 408.

## CHAPTER IV

### HISTORY AND METHOD OF ARCHERY INSTRUCTION

A brief history of the Outdoor Education Project of the American Alliance for Health, Physical Education and Recreation and a detailed presentation of the archery segment of that project from 1960 to 1973, is provided in four portions: the development of archery workshops, the methods and materials developed in conjunction with the workshops, the research conducted on the archery segment of the Outdoor Education Project, and the significant elements of the method of instruction and workshop agenda developed by the Project (see Appendices E and G respectively).

#### Brief History of the Outdoor Education Project

The Outdoor Education Project of the AAHPER. This Project, national in scope, represents one of the most extensive efforts in outdoor education. Prompted by the need for better leadership in teaching skills, attitudes, and appreciations for a better use and understanding of the outdoors for modern living, the AAHPER initiated the Outdoor Education Project in 1955. Following the effective pattern of cooperative programs by business-industry-education, some of the trade associations and industries concerned with the manufacture of outing and outdoor sports equipment made grants of funds available to carry forward the venture. The contributing organizations that have been involved in the Project include the Sporting Arms and Ammunition Manufacturers' Institute, the American Fishing Tackle Manufacturers Association, and the Daisy Manufacturing Company. A doctoral fellowship was made available in 1956-57 by the Outdoor Boating Club of America for a study of boating instruction

in a selected list of schools and colleges in the United States. In 1959, through a grant to Fitness U.S.A. of the AAHPER by the Shakespeare Company, Operation Archery was established and included in the Outdoor Education Project.<sup>1</sup>

The National Shooting Sports Foundation became a sponsor of the Outdoor Education Project in 1964, and in 1966 the American Archery Council, after a six year cooperative association with the Shakespeare Company, assumed the sponsorship of the archery segment of the Outdoor Education Project.

The increasing popularity of archery as an outdoor recreational activity prompted the AAHPER to initiate a special effort to improve the quality of instruction and broaden the scope of archery in schools, colleges, recreation departments, and camping agencies. Originally known as Operation Archery, the program became a segment of the Outdoor Education Project of the AAHPER and is a cooperative venture with the archery industry as represented by the American Archery Council. Through selected pilot centers, research was conducted on methods of instruction and equipment. Archery instructors workshops are held in several sections of the country, and instructional materials have been developed.<sup>2</sup>

Special emphases in the Project have been given impetus from time to time through contributions from the E. C. Hough-Mary Hough Kimble Foundation and Outing Products Manufacturers.

The Outdoor Education Project has been a cooperative enterprise from the beginning. In addition to the groups making grants of funds available, many other organizations have worked with the Association, the National Rifle Association, the American Casting Association, state departments of education, conservation agencies, and schools and colleges. A National Advisory Committee, widely representative of school and college administrators and groups interested in outdoor education, helps guide the efforts of the Project. The major activities of the Project may be categorized as follows:

1. Leadership Training. Workshops and clinics are conducted in nearly all the regions of the United States for school, college, and agency leaders interested in developing outdoor education activities in their own institutions and organizations. The workshops are planned by state and regional committees working cooperatively with the Project staff. State agencies (such as departments of education and conservation), professional organizations, and interested individuals have joined in the planning and execution of the workshops. The three-day sessions feature discussions, clinics, and demonstrations covering the broad areas of outdoor education, with special emphasis on the leading outdoor pursuits.

2. Interpretation and Program Development. Through conferences, visitations, and materials, the nature and scope of outdoor education is [sic] interpreted to school and college administrators and teachers, and to community and youth agencies. Assistance is given in the initiation and development of outdoor education programs.

3. Instructional Materials. Available materials in outdoor education are distributed by the AAHPER and many resource agencies.<sup>3</sup>

The Project has since its inception, been under the guidance of Julian W. Smith, Project Director, who has maintained a joint staff appointment with the AAHPER and in the College of Education at Michigan State University.

#### Archery Segment of the Outdoor Education Project

##### Formation of an Advisory Committee

The initial meeting of the Advisory Committee for the archery segment of the Outdoor Education Project called "Operation Archery" was held at Michigan State University-Oakland, Rochester, Michigan on January 15-16, 1960. The committee was to develop guidelines for the course of action of the archery segment of the Outdoor Education Project.



This committee was established as the result of a proposal to the Shakespeare Company in 1959. The proposal was based on a five point program: (1) creation of an advisory and consultation committee, (2) establishing pilot programs, (3) holding nation-wide archery clinics in outdoor education workshops, (4) establish instructor workshops, and (5) record and evaluate pilot programs.<sup>4</sup>

The original committee was made up of ten individuals: two from colleges, one from a high school, an elementary supervisor, a representative from the National Rifle Association, two representatives from the Shakespeare Company, a college president, an archery school camp director, and the Outdoor Education Project Director.

The committee established as the goals of the archery segment the following:

#### Purposes and Objectives of Operation Archery

1. Improve the quality of archery instruction in schools and colleges by:
  - a. Demonstrating good instructional methods through pilot programs.
  - b. In-service training of teachers through workshops and clinics.
  - c. Research findings on instructional methods.
  - d. Distribution of instructional materials and equipment specifications.
2. Improve the preparation of teachers and leaders for archery instruction through:
  - a. Workshops for instructors in pilot programs.
  - b. Clinics<sup>5</sup> in Outdoor Education Project workshops.

- c. Clinics at State and National HPER conventions.
  - d. Encourage local clinics and workshops sponsored by schools, colleges, recreation departments, and other agencies.
- 3. Broaden participation in archery activities by:
  - a. Encouraging schools and colleges to extend archery programs through publicity, conferences, and materials.
- 4. Promote safety in archery through:
  - a. Examples from pilot programs.
  - b. Preparing and distributing materials.
  - c. The National Rifle Association and archery organizations.
- 5. Study archery needs and recommend specifications for instructional equipment and facilities for college and school use:
  - a. Committees to develop specifications and prepare materials.
- 6. Develop needed instructional materials:
  - a. Prepare packets for pilot centers.
  - b. Assemble AAHPER packets.
  - c. Prepare instructional manual for teachers, to include equipment specifications.
  - d. Urge archery associations to develop additional instructional aids.<sup>6</sup>

### Developing Educational Experiences

The selection of sites for the pilot programs was the responsibility of the advisory committee and the Project director based on: the availability of good instruction, facilities, an interest in becoming a pilot center and agreement to the plans, influential status in the area and approval of the candidate institution's administration.

The pilot programs were to be provided consultant services, supplemental archery equipment, inservice training activities for the staff, and the opportunity to compare results with other schools and colleges.

By February of 1960 eight schools had confirmed their intent to serve as pilot centers. In a progress report dated August 1, 1960 a total of twenty schools representing twelve states, recreation departments, elementary and high schools, and colleges and universities were designated as pilot program centers.<sup>7</sup>

The first workshop for instructors held in Roxbury, Vermont at the Tela-Wooket Archery Camp, June 20-23, 1960 had a total of 38 participants and staff instructors in attendance. Fifteen of the pilot schools were represented at the workshop by 33 participants.

In a fall meeting the advisory committee made plans for the 1961 archery workshops, designating dates to hold the three day workshops. Vermont, Michigan, and Indiana were the sites assigned with a minimum number of 26 participants to be registered at each. Instructors involved in the pilot programs were to be given first preference and a recommended staff-participant ratio was to be approximately one to five.<sup>8</sup>

At the same meeting a subcommittee was assigned to develop a suggested program for the workshop.

#### Workshop Communications

To encourage pilot program instructors who taught or intended to teach archery to attend the 1961 archery workshops the cost for

their food, lodging, and instruction was to be assumed by Operation Archery.<sup>9</sup> Publicity on the workshops was to be supplied "through newsletters, journals, and special communications to schools, colleges, and agencies."<sup>10</sup>

A recommendation was submitted to the committee at the March, 1961 meeting to send a prepared release to the following archery magazines: Archery (National Field Archery Association), TAM, The Archer's Magazine (National Archery Association), Bowhunting, and the National Bowhunter. These publications have cooperated in this effort over the years.

The possibility of establishing regional archery workshops was discussed with encouragement to colleges and universities to conduct archery clinics in their own areas.

The expansion of the number and sites of the 1962 archery workshops was considered at the fall meeting of the advisory committee. Several suggestions were made relative to the workshop program: evening discussion on organization and initiating archery instruction, follow-up letter sent to the participant's administrator, consider publicity as early as possible on up-coming workshops, prospective workshop directors should be invited to attend a prior workshop, dates prior to the opening of school be considered for conducting archery workshops, the expansion of participants to include not only pilot center instructors not previously in attendance but prospective workshop and clinic directors, other school and college instructors, recreation, camp, and agency personnel, and also the following financial assistance policy:

. . . The following expenses should be assumed by Operation Archery: (a) food and lodging expenses for pilot center instructor; (b) food and lodging and travel expenses for consultants and staff; (c) food, lodging, and partial travel expenses for prospective workshop directors. Other participants should assume the nominal cost of food and lodging.<sup>11</sup>

Certification of archery instructors was also a point considered during the October meeting. It was suggested that the AAHPER was the logical organization to administer the certification of archery instructors in cooperation with other organizations and archery associations.

Only two of the three proposed 1961 workshops were held, the California workshop was cancelled. In addition three archery clinics were conducted.

Four archery workshops and nine archery clinics were held in 1962. In a report to the Shakespeare Company on the activities of Operation Archery, it was suggested "that the entire archery industry eventually participate in the archery project."<sup>12</sup>

#### Program Expansion and Cooperation with New Organizations

In 1963 there was a considerable increase in activity with 19 archery clinics and five archery workshops being conducted. The following year 13 clinics and eight archery workshops were held.

At this stage of development the archery segment was considered an integral part of the Outdoor Education Project as evidenced by this statement:

Originally the archery program was known as Operation Archery, but more recently archery has been regarded as one of the essential phases of the Outdoor Education Project. It was suggested that in the publicity both terms be used wherever necessary for clarification. However, it was felt that eventually archery should be considered an integral part of the Outdoor Education Project.<sup>13</sup>

During the first six years of the archery segment of the Outdoor Education Project the Shakespeare Company had been a supportive member of the cooperative effort to enhance archery in the schools and colleges of the nation.

By this time archery equipment, materials and leadership had been supplied through the Outdoor Education Project for archery instruction activities through clinics at outdoor education workshops and professional conferences and archery workshops. By 1965 archery as an outdoor skill had reached well over nine thousand educators through these various meetings.<sup>14</sup>

Two important cooperative ventures began in 1966. In June the Outdoor Education Project entered into cooperation with the American Archery Council.<sup>15</sup> In the same year a project called the Lifetime Sports Education Project (LSEP), asked the Outdoor Education Project to provide instructors, equipment and their archery instructional workshop programs for the various LSEP programs around the country. This cooperative relationship continued until the Lifetime Education Project was terminated in 1971.

The Project's efforts in developing a cadre of archery instructors willing to conduct archery workshops clearly proved effective. It should be noted that honorariums have never been paid

the archery instructors, only their travel, food and lodging costs. In 1966 the Project conducted ten archery workshops along with ten archery clinics. In 1967 a total of 31 workshops and clinics were conducted by 15 different instructors. In the same year, 1967, a further step was taken to provide advanced instruction for archery leaders who would subsequently conduct teacher training archery workshops and clinics for the Project. This effort was a two day workshop attended by 25 invited participants from 14 states. Western Michigan University was the host of the new form of workshop.<sup>16</sup>

To encourage further development of advanced archery in the schools and colleges the Outdoor Education Project initiated two "postal tournaments." They were designed to encourage beginners to compete in tournaments.

One tournament, designed for indoor shooting, consisted of shooting 60 arrows from 20 yards at a 20 inch target for each team member. Only team entries were allowed and four divisions with four categories within each division:

Male Division (four members per team)

1. grade six and below
2. grades seven, eight and nine
3. grades ten, eleven and twelve
4. beyond high school

Female Division (same categories as above)

Coed Division (two males and two females with the same categories as above.)

The other tournament, designed for outdoor shooting, consisted of 30 arrows each from 40 yards, 30 yards and 20 yards for the category beyond high school. In all other categories each team member shot 24 arrows from 30 yards, 25 yards and 20 yards respectively. All divisions shoot at a 36 inch target with team, category and division composition the same in both tournaments.

Teams sent in their scores to the Project, thus the postal tournament, in comparison to a physical tournament.

During 1968 another 27 archery clinics and workshops were held with the Project assisting in an additional ten follow-up clinics conducted by participants who attended Project workshops.

The first advanced archery workshop with American Archery Council certification was held in January, 1969 with 19 instructors being certified as (AAC) Advanced Instructors. The Project conducted an additional 28 clinics and workshops during the year.

A temporary reduction in funding by the American Archery Council resulted in fewer than normal (18) archery clinics and workshops being conducted in 1970.<sup>17</sup> A year later the AAC was able to provide more funds, making it possible to conduct 29 archery clinics and workshops in 1971.<sup>18</sup>

The second advanced archery workshop was held in January of 1972 with 30 participants from nine states receiving the AAC Advanced Instructors rating. Seventeen workshops and clinics were held during the remainder of 1972.

Another advanced archery workshop was held in February of 1973 in Arkansas with a total of 25 participants receiving the AAC Advanced Instructors rating.



The Project's efforts in Archery were an attempt to provide better archery instruction and instructors. To assist in determining the goals of the Project's archery segment an Advisory Committee was established. Those selected had broad archery interests, representing varied professions and organizations.

A number of pilot programs were established to provide a basis for the educational experiences to be included in the workshop program. Through the American Alliance for Health, Physical Education and Recreation, the Project and archery periodicals' mass communication channels were established.

An expansion of the Project's archery segment saw an increased number of workshop offering, certification by the American Archery Council and expanded support as represented by the cooperative efforts of the AAC.

The next section on workshop methods and materials provides some of the sources and intention of experiences and techniques used by the archery segment.

#### Workshop Methods and Materials

During the course of the Advisory Committee's existence a number of subcommittees were appointed. Several of them were to develop instructional methods and materials for the archery workshops. The subcommittees were the working segments of the advisory committee as it moved to accomplish the goals as established in the January 15-16, 1960 meeting.

This section will trace the contributions of the subcommittees, organizations, and individuals in the development of archery instruction as it relates to methods and materials of instruction of the Project's archery workshop.

Five subcommittees were authorized at the second advisory committee meeting held in 1960. They included research, workshop programs, safety, instructional charts, and tournament rounds.

### The Use of Light Draw Weight Bows

At the first advisory committee meeting the bows recommended for the pilot programs were listed in poundage from 15-25 pounds in draw weight. Those recommendations have carried through to the thinking still presented in instruction. The use of light weight bows is still recommended for learning:

1. Bows
  - a. Elementary 15-20 lb. bows
  - b. Secondary 20-25 lb. bows
  - c. College 20-25 lb. bows<sup>19</sup>

The bows were not only light in draw weight but were made of fiber glass. The process in producing them and the material provided a very inexpensive bow for use in the archery workshop. It has continually been used and promoted as a good bow for beginning archers and beginning archery programs.

This emphasis on inexpensive equipment permits the inclusion of archery programs at a nominal cost to schools and recreation programs (see Appendix G, pp. 14-15). There has not been universal

acceptance of this logic, however, as indicated by the skepticism expressed by Robert F. Oxnam, President of Pratt Institute and an original member of the advisory committee, as he indicated his thoughts in a letter to the Project Director.

I do hope at some point in the experiment we will be able to run a test group using what some of us would consider ideal equipment rather than relying on inexpensive equipment alone. There is a question in my mind that what may appear initially to be a more expensive investment may actually prove to be much less expensive in the long run.<sup>20</sup>

#### The Introduction of Various Ideas and Techniques Used in the Workshops

Archery games were a part of the archery workshops, starting with the initial one in Tela-Wooket. They include: clout, wand, roving, and bird and rabbits (see Appendix G, pp. 36-37).

The Modified Flint Round was used with the first pilot program starting in 1960. It still remains a part of the instructional procedure, its only change was the scoring and number of arrows shot.

The Project Director in comments on the testing program conducted at the pilot program centers, mentioned the pre-draw gap aid to instinctive or bare-bow shooting. He said the "system has not yet been published but would appear in print next year."<sup>21</sup> This statement carries no date but it was developed for the 1960-61 academic year. In the same report a system of aiming known as point of aim was mentioned, this type of aiming was later discarded. Thus, both instinctive (bare-bow) and free style (sight method) aiming were used from the beginning.

In the Outdoor Education Project's 1960 Progress Report it was stated that a need existed for "an instructor's manual on various phases of archery."<sup>22</sup>

Lura Wilson, one of the original members of the Advisory Committee, recommended two equipment items in the instructional program. She suggested that a shooting tab be used because of the ease with which several people can use the same protective device for the shooting hand and the use of ground quivers rather than side or hip quivers. The tab is still recommended for instructional programs, while the ground quiver was tried but the hip quiver was most often used in the archery workshops (see Appendix G, p. 14).<sup>23</sup>

Myrtle Miller, in developing materials for the archery workshops, suggested that her "Practical Aids and Safety" be reproduced and included in the materials provided by the Project.<sup>24</sup> This was done and it was called "Practical Aids for Archery Instructors." It proved to be a valuable start in the development of materials and also influenced some of the methods of instruction. It employed a combination of traditional and new ideas.

The guide stressed the use of inexpensive light draw-weight bows for all ages and inexpensive arrows for the beginner. Mention was made of indoor shooting with the aid of a backdrop (felt, wool, or nylon netting). Safety was continually stressed and the importance of the shooting tab or glove and the arm guard was highlighted. Seven steps of shooting were specified: (1) stance, (2) nocking the arrow, (3) the draw, (4) the anchor, (5) aiming or holding, (6) the loose or release, and (7) follow through and afterhold. Also

included were "interest stimulating suggestions" for intramurals, clubs, organizational hints, and additional resources. Both sight and instinctive shooting instructions were given, together with field archery and bowhunting tips including safety rules for both. A list of twelve safety rules were listed for the beginner. All but one of them is still stressed. The use of a sight is stressed along with the now extinct "point-of-aim."<sup>25</sup>

In addition to the Miller brochure three additional outlines to aid instruction were furnished pilot program instructors and participants of the 1960-61 archery workshops. The first, for the pilot programs, was called "Starting Procedure for Pilot Programs"; the second was entitled "Teaching Progression for Beginners"; and the third was "Program Outline Suggestions for Class Teaching." All three outlines mention the use of mimetics, a concept which has been retained in some form in the present instructional methods. Most of the information contained within the outlines was duplicated from the "Practical Aids for Archery Instructors" in a lesson plan arrangement. The use of the coach-pupil method was also suggested for use on the shooting line.

The information provided the archery instructor within these outlines lacked depth and, unfortunately, the instructor had to rely heavily on knowledge not included therein.

In their October 1961 meeting the advisory committee recommended the inclusion of archery crafts and repair whenever possible, the issuing of a certificate of attendance, and the development of a resource pool of leaders to eventually help in the conduct of archery

clinics and workshops. They also stressed the need to include archery clinics in other Outdoor Education Project workshops, thus giving exposure and creating an interest in archery. Items that were suggested for inclusion in the archery instructor workshops included: backstops, light portable targets, and glass arrows.

Practice teaching and archery crafts were included in the 1962 archery workshop held in Michigan. Workshop participants were also given certificates of attendance at all of the 1962 archery workshops.<sup>26</sup>

The advisory committee was asked in 1963 to suggest needed changes in the "Safety of Archery" publication by the National Safety Council. They also recommended that several additions be included in the materials supplied the archery workshop participants: the "NRA Hunter Safety Handbook," "ABC's of Archery," an annotated archery bibliography, DGWS Archery Guide, and Beginning Archery. It was reported that posters and charts on archery instruction were still nonexistent.

A new workshop format was tried in 1964. Held only two days, it was tabbed a "drive-in" type workshop. The Project report for the year noted that this "intensive archery instruction seemed to be highly successful and may serve as an example for future similar workshops during the school year."<sup>27</sup> Several such workshops were held over a two year period and then dropped from the workshop format.

In the 1964 advisory committee meeting the inclusion of archery crafts was questioned and more review during workshops was suggested for evening sessions as the workshop progressed.<sup>28</sup>

The first draft of "The Manual for Archery Instructors Workshop" was finished in 1964 to "assist those who plan to conduct workshops for archery instructors."<sup>29</sup> Included in the suggestions were three items now considered a part of the method of instruction:

(1) the bows should be strung for the student, learning how to string them is to be covered later, (2) draw the string back three inches, without an arrow and release the string, (3) instinctive aiming should be compared to throwing a ball--look at where you want the arrow to go.<sup>30</sup>

Under a section entitled "Instructional Tips," a number of implications for learning principles were included as follows:

. . . the student should be given a bow and arrow to shoot as soon as possible; use a positive approach, minimize the use of "don't"; praise, tell the student how to do it correctly and not what they're [sic] doing wrong; no shooting demonstrations by instructor, the expert can only lose status; integrate safety and safety rules as they relate to the ongoing activity; don't attempt to analyze the shooting fundamentals of the archer by observing the release of one arrow; don't over instruct; include alternate practice activities in the form of archery games.<sup>31</sup>

To expand and increase the understanding of instinctive shooting and the teaching of it a visual chart and descriptive outline were developed. This system, called the "pre-draw gap system," was developed by Dick Wilson. It is a method by which instinctive shooting is aided and to

. . . greatly speed the attaining of proficiency in bare bow shooting, at distances up to about 35 yards, for it demands that the archer become fully aware of bow arm elevation. The gap system is not to be regarded as an end in itself, but as a tool which can help the archer quickly arrive at a point where he can shoot automatically without having to learn on any gap system or artificial device.<sup>32</sup>

In a letter to Julian W. Smith, Dick Wilson established the ten steps of shooting. The first five steps were designated as "static" and the second five steps were designated as "dynamic." These steps were listed as: (1) stance, (2) nock arrow, (3) set hook, (4) bow hand, (5) straight arm, (6) raise unit, (7) draw-anchor, (8) aim-hold, (9) aim-release, and (10) aim-follow through.<sup>33</sup>

An archery manual Group Archery Instruction for Beginners: A Planning Guide was prepared in 1967 by a committee appointed by the director of the Outdoor Education Project and published by the American Association for Health, Physical Education and Recreation. This was the fruition of the seven years of workshops, ideas, suggestions, teaching methods, and a bibliography on archery finally put into a single volume. It provided the basic format for a later edition published by the AAHPER in 1972.

Copies of the manual were distributed to all workshop and clinic participants and to selected archery instructors and specialists. It was used as a teaching guide in all the workshops. All receiving it have been invited to send suggestions for improvements when the next edition is prepared. Several sessions have been devoted to a study of the manual and a file is being kept on all suggestions for revisions and additions.<sup>34</sup>

The initial publication and its sequel were, in part, due to the efforts of Dick Wilson. His leadership in archery resulted in his election to the presidency of the American Archery Council and his span of office ran from its inception in 1963 to 1971.

The first college credit was awarded for an archery workshop conducted in cooperation with the Outdoor Education Project and held at Stanford University June 26-30, 1967. This workshop was joined by



one held at State University College at Cortland, New York June 28-July 12, one at Northern Arizona University August 6-11, and one at Texas Woman's University August 7-11. Since 1967 several archery workshops have been held annually through the cooperative efforts of the credit granting institutions and the Outdoor Education Project.

Excerpts from two letters indicate the acceptance of the OEP method of archery instruction. The first is from an enthusiastic instructor in college level recreation classes:

I enjoyed our training session last fall. I have taught this new approach to two classes so far. Both classes enjoyed the activity more, and improved more than my previous classes.<sup>35</sup>

The second speaks of the application of the method to special training for handicapped veterans:

Bill Cushman and I have been teaching archery with the OEP method to blind veterans from Viet Nam. What an experience! What's more the method works for them!<sup>36</sup>

To help facilitate the growing demands on the archery segment of the Outdoor Education Project a part-time staff member was added in 1968.

The American Archery Council produced the film "The World of Archery" in 1967. The film depicted the instructional archery program that was developed through the cooperative efforts of the archery industry and the Outdoor Education Project.

A second film "Outdoor Education" was produced in 1969. It emphasizes archery instruction as a part of outdoor education programs in schools. In the same year a series of four instructional loop films were produced by a commercial firm. A consultant was requested

from the Project's cadre of archery leaders. This cooperative effort was initiated and sponsored by the National Collegiate Athletic Association Film Service. The film loops portrayed the method of archery instruction as developed through the efforts of the Outdoor Education Project.

Starting with the initial advanced archery instructors' workshop the ten step method of archery instruction was portrayed on a large chart. The chart has been used, since then, at all Project sponsored archery workshops.

After the completion of the 1970 Advanced Archery Workshop a committee was established by the Project Director to revise and add to the existing archery instructors manual. The additional portion of the manual was to include individual instruction and in-depth analysis of archery instruction which was the format of the advanced workshops. (See Appendix G, pp. 38-59.)

A new and important development was reported by the Outdoor Education Project in 1971.

Teacher training institutions are now adopting the Outdoor Education Project's archery manual as their course guide and those teachers possessing the AAC Advanced Instructor's certification are beginning to certify their students as they complete the course. This is an important step in the Project's efforts to update the training of archery teachers. This process as it unfolds will be similar to the certification of Red Cross Instructors that insures the standardization of teaching methods, techniques and knowledge.<sup>37</sup>

The revised instructional manual was published in 1972 under the title Archery: A Planning Guide for Group and Individual Instruction.

During the same year the American Archery Council, in cooperation with Easton Aluminum Company, approved the production of a film about the development of archers. This action led to the filming of archery in the 1972 Olympics in Munich, Germany. The film portrayed instruction at schools, colleges, recreation, and club programs. The film was released in 1973 and was entitled "A Return to the Olympics."

The archery manual has been favorably accepted by archery instructors throughout the country as illustrated in a 1972 letter:

I recently completed an archery unit at Juanita High School, Kirkland, Washington. I enjoyed teaching all the "new" things which I learned at Cispus in September. The archery manual used at the workshop--prepared by your AAHPER Committee--is the best teaching guide I've used. It is basic and complete--just the type of book needed.<sup>38</sup>

Archery World magazine initiated the development of a series of archery posters in 1972. These were developed in consultation with another of the Project's archery leaders. It provides a series of 12 instructional posters that add to the instructional aids that can be used in archery programs.

The methods and materials used in the Project's archery workshops had many contributors. This section revealed many of the sources and reasons for the inclusion of basic techniques, experiences, materials and archery equipment.

As an outgrowth of the Project's efforts in archery many instructional aids for archery were developed: an instructional manual, loop films, posters and a simple sequential method of instruction. The learning experiences, the granting of college credit to select workshops, the advanced archery workshops, and the

certification of workshop participants by the American Archery Council were the culmination of the Project's involvement in the instruction of archery.

The following section shows the Project's efforts in securing data on the archery program.

### Research

Two major efforts have been made to evaluate archery instruction by the Outdoor Education Project. In 1960 the Advisory Committee, as established by the Project, requested that two individuals on the committee prepare an outline of research procedures for gathering data from the pilot program centers. As established and distributed by the Project for the pilot centers, the statement of purpose emphasized the gathering of data for evaluation of teaching and equipment used in archery programs:

. . . to determine the best teaching methods and rounds to train archery teachers and improve teaching, and to compile and/or make available the best information and literature for the success of the teaching program. New novelty rounds, hunting techniques, safety measures, etc., will be studied and evaluated.<sup>39</sup>

The gathering of data started early in 1960 and concluded in 1963, covering a three year period. In June of 1963 Arnold Haugen submitted his report on the findings of that research as data were submitted from the pilot centers. The report dealt only with equipment as indicated by a letter to Julian W. Smith. Dr. Haugen stated that he had not analyzed any of the scores.<sup>40</sup> The report applied to equipment used by beginning male and female archers.

It was found that 90% of the women used bows with draw weights between 18 and 25 pounds. Fifty percent of the men used bows of 24 to 25 pound draw weight, with 20% using bows of 20 to 21 pounds and 10% of 30 to 31 pounds. Thus, women used bows that averaged approximately four pounds less.

Solid fiber glass bows were used by 78% of the men and 76% of the women. Haugen reported that women archers were still using more obsolete equipment than men, using more wood bows, fewer center shot bows, more solid arrow rests or none at all. Women also reported only two out of five had marked nocking points. Wooden arrows were used by both the women (90%) and men (85%), although aluminum and glass arrows are more accurate and durable (and more expensive). In related discussion on equipment several observations were made in the report: satisfaction with the fiber glass bow over the wooden bow, cushioned arrow rests and nocking points on strings should be used, and better arrow shaft materials (glass or aluminum) should be used.<sup>41</sup>

In 1965 the Outdoor Education Project sent a questionnaire to participants of the archery workshops; 119 responded. Those responding represented the following institutional areas: schools-35%, colleges-30%, camps-30%, and other (clubs, recreation departments) 6%.

A summary of the participants responses indicated the following:

1. Ninety-five percent felt qualified to teach after the workshop
2. Ninety-three percent felt they could conduct a tournament in class

3. Most important items learned:
  - a. Safety procedures, ninety-eight percent felt it was stressed enough
  - b. Teaching and class techniques, ninety percent.
  - c. Variety of archery activities, eighty-nine percent.
4. Method of shooting and teaching
  - a. Seventy-four percent indicated the workshop method was different than previously used
  - b. Sixty-six percent felt the workshop method was better
5. Everyone responding indicated they would recommend the archery workshop to others
6. Equipment and facilities
  - a. Bows, 84% used some glass, 50% used some laminated, and 50% used some wood
  - b. Arrows, 90% were using wood with an indication of more glass arrows being used.
  - c. More indoor instruction taking place
  - d. A trend was under way to provide sufficient equipment for each student in the class<sup>42</sup>

A study was conducted during the 1966-67 school year at Indiana University to estimate the reliability of the modified Chicago Round and the Modified Flint Round. Both of these were developed for the archery workshops and subsequent archery programs in the school and colleges.

The reported conclusions were:

1. The Modified Chicago Round and Modified Flint Round are reliable measure for evaluating archery achievement of college men in a basic physical education instructional course.

2. The relationship between the Modified Chicago Round and the Modified Flint Round is sufficiently low to warrant using both measures.
3. The defined criterion of total archery ability may be predicted with a high degree of confidence.<sup>43</sup>

The Modified Chicago and Flint Rounds were developed for the Outdoor Education Project's archery workshops. The Modified Chicago Round is shot from a distance of 20 yard at a 36 inch target. The Modified Flint Round is shot at six different distances, from 20 feet to 20 yards and at targets of 12 and 18 inches.

The study showed that the two rounds measured different abilities. The Modified Chicago Round evaluates the consistency of the archer while the Modified Flint Round evaluates the archer's ability to adjust to varied distances and target sizes.

The study was conducted to estimate the reliability of the Modified Chicago Round and the Modified Flint Round, to investigate the relationship between the two rounds, and to develop a regression equation that would predict archery ability of college men.<sup>44</sup>

During the closing session of the Outdoor Education Project's archery workshops written and/or oral evaluations were made by the participants at the request of the workshop staff. Such information contributed to the development of the archery workshops and the method of archery instruction.

Research on the equipment used by the Project's pilot centers was conducted from 1961 to 1963. It showed a majority of the programs used light draw weight, inexpensive bows and wooden arrows. In 1965 a questionnaire sent to workshop participants revealed a high percentage of them were satisfied with the workshop and the method of

instruction. An independent study, conducted on the archery rounds used in the workshops, revealed they were reliable for use in archery programs. Each archery workshop provided the participant with an opportunity to evaluate the workshop either orally or in written form.

A presentation of the important ingredients of the Project's method of instruction follows in the final portion of Chapter IV.

#### The Outdoor Education Project's Method of Archery Instruction

Any method of archery instruction will contain common components such as body mechanics and the type and use of equipment. The key to the Outdoor Education Project's method of archery instruction is the process, exemplified by its adopted slogan "Immediate participation, immediate success." Paramount to the accomplishment of these objectives is the definite sequential arrangement of instructional steps. In the group instruction approach used in the workshops and clinics, the instructor in clear and concise terms "walks" the participant through the ten steps. During the entire process simple explanations are used to help the learner attain sufficient skill for reasonable success. Following the ten step sequence and shooting a few arrows, more detailed and precise instruction follows. Accepting the challenge of early success the learner, assisted by the instructor and assistants, proceeds to refine the basic skills and to give attention to the learning problems of the individual learner.



The most salient parts of the beginning instruction (see Appendix G) are drawn from the archery manual developed by the committee appointed and supervised by the Outdoor Education Project Director.<sup>45</sup>

The author presents the method of instruction as it, the learning experiences and the workshop are organized.

### Workshop Objectives

The Project's archery workshop is conducted over a three day period. The workshop objectives as presented at the opening session include:

1. A thorough understanding and the ability to shoot a bow using the ten step method of instruction.
2. An understanding of equipment costs, storage and repair.
3. An understanding and ability to shoot a bow using the free style and instinctive method.
4. An awareness of and participation in target archery, field archery and archery games.
5. Illustrations and discussion concerning adaptations of local facilities for archery programs.
6. The knowledge and opportunity to practice archery safety procedures.
7. An understanding of the roles of the various archery organizations.
8. A guide for developing an archery program and a forum for discussion on its applicability to local programs.
9. Instructional materials as aids for the understanding and teaching of archery.

### Ten Step Method of Instruction

During the three days the workshop participant is provided with direct first hand experiences in shooting a bow and with a sequential method by which to teach archery. Subsequent discussion and practice sessions allow the individual to improve upon the understanding and skill of shooting the bow and teaching others how to shoot it. Included within the learning experiences: (1) determining eye dominance, (2) immediate participation in shooting at a large target from a close distance, (3) shooting at varied distances by the two styles, (4) stringing and unstringing a bow, (5) using the student/coach-shooter procedure, (6) shooting two tournament rounds, (7) shooting a variety of archery games, (8) shooting both indoors and outdoors, (9) preparing the bow and arrows for shooting, (10) viewing archery films and other instructional materials, and (11) discussions on the techniques used in presenting the skills, on the equipment used, on adapting existing facilities, on program development, on archery organizations and the participant's evaluation of the workshop.

### Principles of Learning Involved with the Method of Instruction

The learning readiness of the workshop participant is considered initially in the orientation session. At that time each participant is asked to follow the step by step learning process as presented at the workshop. This appeal is primarily to reduce the practice of skills learned prior to the workshop. All participants originally go through the basic shooting procedure. The next step

in the instruction is to have one participant coach a selected partner. By watching the archer, as he shoots, the coach selects a portion of the shooting fundamentals and decides if it was correctly performed or if corrections are needed. By this process individual readiness is taken into account, allowing the more accomplished to move onto areas more appropriate to their skill level. It also provides an opportunity for the coach to compare individual performance with the prescribed technique. The individual, after having shot a number of arrows by using both shooting techniques, is allowed to select the method he prefers. There are several supervised voluntary practice sessions that an individual can attend to further his level of competence.

The learning readiness or entering behavior of the individual, considered at the workshop, requires the accommodation of individual differences. This is accomplished in several ways already described in the preceeding paragraph: (1) student/coach shooter procedure, (2) selection of shooting method, and (3) by voluntary practice sessions. Additionally discussion sessions during the practice shooting attempts to reconcile individual problems, discussion sessions that review the proceedings, and a varied format in the form of archery games provide enjoyable practice sessions.

An essential incentive for motivating the workshop participant has been the certification as basic instructor, through the American Archery Council. Participants had requested that some completion credit or competency rating be accessible to workshop participants as early as the October, 1961 meeting of the Advisory Committee.<sup>46</sup>

The immediacy of shooting by the workshop participant and the success enjoyed by all individuals serves as incentive in reducing any anxieties over the thought of failure. As Harry Miller observed togetherness in adult groups serves as a linkage to behavioral change. The positive approach to correcting errors is emphasized by the instructors. Explanation and review of correct fundamental procedures are stressed. Telling an individual what he is doing wrong is minimized. The opportunity for discussion and understanding the fundamentals provides the further possibility for reducing any fear or anxiety over not succeeding. Through the introduction of a variety of archery games further practice is gained while using the skill under varied conditions.

Many opportunities for reinforcement or feedback are provided the participant, over the duration of the workshop, starting with verbal commands explaining the ten step method combined with mimetics and demonstrations. Ten step charts are also visible to the archer for reference. The participant is talked through the procedure several times until the participant appears comfortable with the action of releasing the arrow. He is then allowed to perform the skill with the aid of his coach. Through the use of the student/coach shooter procedure the positive techniques are brought to each individual, the eyes of each coach serves as a mirror in guiding the shooter. Shooting provides a visual opportunity for personal assessment with emphasis placed on shooting form not score. Instructional loop films and other archery films are used to compare shooting techniques. During the many discussion periods the method of

instruction is under continual analysis by the participant and the workshop instructors.

Through the active participation of those attending the workshop the individual has an opportunity to evaluate the method of instruction as it pertains to him. The participant also is in a position to judge the method of instruction as it relates to other participants. That judgment is based on visual observation of the shooting performances of others and their skill progression, conversation with participants on an informal basis and in the formal discussion sessions. The participant also has the opportunity to evaluate the workshop at the end of the three days.

Another important characteristic of an innovation is the degree to which it is visible to the adopter. Through the active participation in the skill of shooting and the explanation and discussion concerning the method permits the individual to observe the method of instruction and its effectiveness. Throughout the workshop the basis for the techniques are explained and open for discussion and analysis.

The workshop presented a sequential step by step method of learning how to shoot a bow while learning how to teach others to shoot a bow.

The Project's method of instruction takes account of four elements essential for learning: readiness, motivation, reinforcement and direct involvement. The innovative method of instruction provides opportunities for the participant-leader to: evaluate the

method of instruction throughout the workshop, observe the method's effect on himself and others, enjoy the success and understanding of the method of instruction, assess the method's satisfaction of personal needs and its advantages to himself and his program.

### Summary

The purpose of this descriptive case study was to examine and describe the Outdoor Education Project's workshops, a continuing education program for developing leaders of instruction and program development in the leisure skill of archery.

Specifically the data in this chapter provides information in response to these important questions:

1. What were the objectives of the Outdoor Education Project's archery workshop and who established them?
2. How were the goals and objectives of the workshop presented to the participant?
3. What methods of communication were employed in promoting the archery workshops?
4. How was learning readiness of the workshop participant taken into account?
5. Were opportunities provided to accommodate differences in the rate of learning?
6. Were incentives provided to motivate the participant?
7. Was the participant able to observe the object and the idea components of the method of instruction?
8. Did the participant have the opportunity to experience feedback?
9. Did the method of instruction lend itself to evaluation by the participant?
10. How were the strengths and weaknesses of the planned workshop programs evaluated by the Project?

Through examination of written records in the Outdoor Education Project office and other publications answers to the above questions were derived.

### Findings

1. The general objectives of the Outdoor Education Project's archery workshop was established by the Advisory Committee.
2. The general objectives were to: improve the quality of archery instruction in schools and colleges, improve the preparation of teachers and leaders for instruction, broaden participation in archery activities, promote safety in archery, study archery needs and recommend specifications for instructional equipment and facilities for college and school use and develop needed instructional materials.
3. Publicity for promoting the archery workshops was developed through the American Alliance for Health, Physical Education and Recreation's journal and newsletter, the Project's newsletter and special communication to schools, colleges and agencies, and through the archery periodicals.
4. Learning readiness is dealt with directly when an appeal is made to the participants, prior to active participation, that they practice the method being taught during the workshop and avoiding the practice of previously learned archery skills.
5. The individual rate of learning is accommodated through the student/coach-shooter technique, discussion, voluntary practice sessions, individual choice of shooting style and a variety of archery rounds and games.
6. Several incentives designed to motivate the participant are provided: American Archery Council certification, the "immediate participation-immediate success" premise, the intimate atmosphere at the workshop setting, a positive approach to correcting errors using "do" not "don't," providing the participant with an instruction manual which includes the method of instruction and suggested program, the process of selecting the workshop participant and a select number of college credit workshops.

7. The participant, through his direct involvement in the workshop, has the opportunity to experience the method of instruction through participation and discussion and to observe and discuss with others their opinions about the instructional method.
8. The workshop experiences provide a variety of feedback opportunities, verbal commands, mimetics, demonstrations, practice, visual charts, movies and discussion sessions.
9. Through the direct involvement of the participant in the act of shooting, the opportunity to discuss the method and to observe success of himself and other participants while using the Project's method of instruction allows each participant ample opportunity to evaluate the method.
10. The Project assessed the strengths and weaknesses of the planned archery programs through a study of the pilot centers, a survey of workshop participants, an independent study of the Project's archery rounds and the oral or written evaluation of the workshops by the participants.

Chapter V presents the data from the mailed questionnaire and the telephone interview.



FOOTNOTES: CHAPTER IV

<sup>1</sup>Julian W. Smith, Reynold E. Carlson, Hugh B. Masters, and George W. Donaldson, Outdoor Education (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), p. 281.

<sup>2</sup>Julian W. Smith, Reynold E. Carlson, Hugh B. Masters, and George W. Donaldson, Outdoor Education, 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972), p. 155.

<sup>3</sup>Smith, Outdoor Education (1963), pp. 281-282.

<sup>4</sup>Outdoor Education Project, "A Proposal: To Improve and Extend the Teaching of Archery in Schools and Colleges," 1959, pp. 1-2.

<sup>5</sup>The clinics are one or two days in length and are designed as introductory or refresher programs. Workshops by comparison present an archery method of instruction and organization of archery programs which includes intramural and tournament competition.

<sup>6</sup>Outdoor Education Project, "Fitness U.S.A.--Operation Archery," January 15-16, 1960, pp. 1-2.

<sup>7</sup>Outdoor Education Project, "Operation Archery: Progress Report 1959-60," August 1, 1960, Addendum 2.

<sup>8</sup>Outdoor Education Project, "Proceedings of the Advisory Committee," October 2-4, 1960, p. 2.

<sup>9</sup>Outdoor Education Project, "Proceedings of the Advisory Committee," March 15-16, 1961, p. 2.

<sup>10</sup>Ibid.

<sup>11</sup>Outdoor Education Project, "Proceedings of the Advisory Committee," October 2-3, 1961, p. 3.

<sup>12</sup>Outdoor Education Project, "A Progress Report on Operation Archery, 1961-62," September 1, 1962, p. 5.

<sup>13</sup>Outdoor Education Project, "Proceedings of the Archery Advisory Committee," March 17-18, 1963, p. 3.

<sup>14</sup>Outdoor Education Project, "Six Years of Progress with the Archery Segment of the Outdoor Education Project, 1959-1965," January 1, 1966, p. 3.

<sup>15</sup>The American Archery Council, which was organized in 1963, is comprised of representatives from each of the following national archery organizations: Archery Manufacturers Organization, Archery Lane Operator's Association, American Indoor Archery Association, National Archery Association of the U.S.A., National Field Archery Association of the U.S.A., Professional Archers Association, and the Professional Bowhunters Society.

<sup>16</sup>Outdoor Education Project, "A Progress Report to the American Archery Council," February 1, 1968, p. 1.

<sup>17</sup>Outdoor Education Project, "A Progress Report to the American Archery Council," May 15, 1970, p. 4.

<sup>18</sup>Outdoor Education Project, "A Progress Report to the American Archery Council," August 31, 1971, pp. 1-2.

<sup>19</sup>Outdoor Education Project, "Proceedings of Committee," January 15-16, 1960, p. 4.

<sup>20</sup>Letter from Robert F. Oxnam to Julian W. Smith, February 17, 1960.

<sup>21</sup>Outdoor Education Project, "Letter of Instruction for Research and Testing Program," p. 1.

<sup>22</sup>Outdoor Education Project, "Progress Report 1959-60," August 1, 1960, p. 3.

<sup>23</sup>Letter from Lura Wilson, Central High School, Gran, New York, to Dick Wilson, August 31, 1960.

<sup>24</sup>Letter from Myrtle Miller, Director, Tela-Wooket Archery Camp, to Julian W. Smith, September 7, 1960.

<sup>25</sup>Myrtle K. Miller, "Practical Aids for Archery Instructors in Colleges and Universities, Schools, Camps, Clubs" (distributed by The Outdoor Education Project, 1960), pp. 2-10.

<sup>26</sup>Outdoor Education Project, "Archery Activities of the Outdoor Education Project, 1962-1963," September, 1963.

<sup>27</sup>Outdoor Education Project, "Archery Activities of the Outdoor Education Project 1963-1964," October, 1964, p. 7.

<sup>28</sup>Outdoor Education Project, "Proceedings of the Planning Meeting for the Archery Segment of the Outdoor Education Project," October 13, 1964, p. 2.

<sup>29</sup>Outdoor Education Project, "A Manual for Archery Instructors Workshops," 1964, p. 1.

<sup>30</sup>Ibid., p. 2.

<sup>31</sup>Ibid., p. 6.

<sup>32</sup>Marcella D. Woods, "Pre-Draw Gap System," presented at the National Association of Physical Education for College Women, 1964, p. 1.

<sup>33</sup>Letter to Julian W. Smith from R. T. Wilson, Manager Archery Division, Shakespeare Company, January 28, 1965.

<sup>34</sup>Outdoor Education Project, "A Progress Report to the American Archery Council," February, 1968, p. 4.

<sup>35</sup>Letter from Mary Kinman, Department of Physical Education, William Jewell College, Liberty, Missouri, April 8, 1968.

<sup>36</sup>Memorandum from Judy Book, Stanford University, September 3, 1968.

<sup>37</sup>Outdoor Education Project, "A Progress Report on Archery Activities of The Outdoor Education Project," August, 1971, p. 3.

<sup>38</sup>Letter from Rose Marie Murphy, Physical Education Instructor, to Julian W. Smith, November 8, 1972.

<sup>39</sup>Outdoor Education Project, "Teaching Research Project," 1960, p. 1.

<sup>40</sup>Letter from Arnold O. Haugen, Iowa State University, June 3, 1964.

<sup>41</sup>Arnold O. Haugen, "Operation Archery Equipment Report," June 3, 1963, pp. 1-4.

<sup>42</sup>Outdoor Education Project, "Evaluation of Archery Instructors Workshop," Fall, 1965.

<sup>43</sup>Roger M. Zabik and Andrew S. Jackson, "Reliability and Prediction of Archery Achievement," unpublished material, 1967, p. 3.

<sup>44</sup>Ibid., p. 1.

<sup>45</sup>American Association for Health, Physical Education, and Recreation, Archery: A Planning Guide for Group and Individual Instruction (Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1972).

<sup>46</sup>Outdoor Education Project, "Proceedings of the Advisory Committee," October 2-3, 1961, p. 3.

## CHAPTER V

### PERSONAL TESTIMONY

#### Introduction

In an effort to evaluate the impact of the Outdoor Education Project's archery program and the method of archery instruction, a questionnaire was mailed to workshop participants who had attended one or more of the Project's archery workshops from 1969 through February of 1973. The questionnaire was mailed to 467 individuals in 39 states and five Canadian provinces. A copy of the questionnaire is found in Appendix A.

To balance, to some extent, the subjectivity of the responses from the questionnaire a taped telephone interview was conducted to further judge the impact of the Project's archery workshops. Ten educators were selected on the basis of their knowledge of the goals of the Outdoor Education Project's archery program, their positions as observers of current practice, and their qualifications to judge the effectiveness of any subsequent adoptions of the goals and methodologies in school, college, or recreation agency programs.

It was reasoned that congruence between the self-reported answers to the questionnaire and the observations of those activities by the ten educators would provide a cross validation for the data upon which several conclusions are based.

### Presentation of Data

These ten persons selected for the telephone interview represented ten different states and were serving in the following professional capacities:

State Department of Education	3
County Supervisor of Physical Education and Athletics	1
Director of Conservation School	1
College/University Physical Education, Recreation Instructors <sup>1</sup>	3
Director of Community Education	1
Elementary/Secondary Physical Education <sup>2</sup>	1

They answered the questions on the basis of having observed archery in the settings:

#### Scholastic Setting

Elementary	1
Junior High School	3
Senior High School	5
College	4
Adult	1

#### Recreational Agency Setting

4-H	1
Boy Scouts	1
Camp Program (Grades 3-12)	1
Summer Program (Grades 3-7)	1

Some of the respondents in the telephone interview reported multiple observations; thus the sum of settings exceeded the number of respondents.

The results of the telephone counter check are presented in Table 1 as an agreement-disagreement dichotomy relative to the participants' responses to comparable questionnaire items.

Questions concerning expansion of programs as a result of the workshop, improved ability in group instruction and improved archery programs were asked of the workshop participants and the telephone respondents.

TABLE 1.--Comparison of responses to three questions from telephone interview and questionnaire.

Question	Respondent Category	Yes	No
Are you aware of the expansion of programs that include all or portions of this method of teaching archery?	Questionnaire Telephone	152 9	21 1
Do you feel, as a result of the Outdoor Education Project's archery workshops, that instructors are better equipped to offer group instruction in archery?	Questionnaire Telephone	197 9	4 1
In your opinion, have the archery programs improved as the result of the experience at the workshop?	Questionnaire Telephone	166 10	24 0

The observed agreement between the telephone interview and the self reported data does provide favorable evidence for cross-validation of the questionnaire responses.

Questionnaires were mailed to 467 teachers, recreation leaders, administrators, and graduate students who had been trained and certified as Basic Archery Instructors by the American Archery Council. Fifty-six questionnaires were returned by the postal service because of a change of address. Thus, of the original 467 questionnaires mailed 411 were assumed to have been delivered. Two hundred five were returned with partial or complete answers to the eleven questions with two unusable. The number of respondents was thus reduced to 203.

TABLE 2.--Category breakdown of mailed questionnaire.

Category of Questionnaire	Number
Mailed	467
Returned by Postal Service	56
Assumed Delivered	411
Returned	205
Spoiled	2
Not Returned	206

Fifty-two (52) respondents reported they were no longer involved in teaching or coordinating archery programs. However, all of them answered portions or all of the questions.

The characteristics of the respondents were gathered from responses to questions one through four:



1. Archery instruction prior to the workshop 148  
     No archery instruction prior to the workshop 55
2. Currently responsible for archery instruction  
     or coordination 151  
     Not currently responsible for archery instruction  
     or coordination 52
3. Archery instruction subsequent to the workshop 44
4. Grade levels in which the participant teaches  
     archery<sup>3</sup>

K-3	<u>2</u>	4-6	<u>20</u>	7-9	<u>47</u>	10-12	<u>64</u>
College	<u>72</u>	Adults	<u>16</u>	Summer Camp	<u>1</u>		
Special Education	<u>1</u>	No Indication	<u>33</u>				

The respondents were placed into two categories, (1) with instruction prior to the workshop, and (2) without instruction prior to the workshop. This distinction over previous archery experience must be made so that reported changes can be estimated as they relate to or do not relate to the Outdoor Education Project's archery workshop. The acceptance of new methods by adults with previously established behavioral patterns is an obstacle that needs to be dealt with for effective change to occur.

To examine the interest generated by attendance at the Outdoor Education Project's archery workshop to attend subsequent archery instruction the participants were asked to report if they had attended any instruction following workshop attendance. Subsequent attendance is examined in relationship to instruction prior to attendance at the workshop and the number of months elapsed since attending the archery workshop.

Table 3 presents the distribution of participants with and without archery instruction prior to attending the archery workshop and those attending subsequent instruction.

TABLE 3.--Distribution of workshop participants with and without prior instruction relative to subsequent archery instruction.

Subsequent Instruction	Prior Instruction		
	Yes	No	Total
Yes	15.8%	5.9%	21.7%
No	57.1%	21.2%	78.3%
TOTAL	72.1%	27.9%	100.0%

TABLE 4.--Distribution of workshop participants who had subsequent archery instruction relative to their prior instruction.

	Prior Instruction	
	Yes	No
Had Subsequent Archery Instruction	21.6%	21.8%

Table 3 indicates that the majority of the respondents did not seek additional archery instruction. However, Table 4 shows an almost identical percentage of workshop participants sought subsequent instruction regardless of their prior instruction.

In Table 5 the amount of elapsed time is examined in relationship to subsequent archery instruction.

TABLE 5.--Distribution of workshop participants attending subsequent instruction in relationship to a time lapse.

Subsequent Instruction	Prior Instruction	Months Elapsed Since Attending Workshop					Totals
		11 or less months	12-23 months	24-35 months	36-47 months	48-52 months	
YES	YES	4.5%	13.6%	13.6%	11.4%	29.3	21.6%
	NO	2.3%	6.8%	6.8%	4.5%	6.8%	21.7%
NO	YES	16.4%	18.9%	13.2%	13.8%	10.7%	74.8%
	NO	5.6%	10.7%	7.0%	1.9%	1.9%	78.3%
							78.2%

Table 5 shows that the greatest number of those who attended subsequent archery instruction appeared in the elapsed time period of 48 to 52 months. Those with the least amount of elapsed time had the fewest attending subsequent instruction.

The participants were then asked in question five if they had conducted subsequent archery workshops or if they had assisted colleagues with their archery instruction. Table 6 reveals the response to this question by those having attended an Outdoor Education Project archery workshop with or without prior archery instruction.

TABLE 6.--Respondents indicating if they had conducted workshops or assisted colleagues with archery instruction.

Prior Instruction	Conducting Workshops or Assisting Colleagues		
	Yes	No	Total
YES	40.8%	31.3%	72.1%
NO	13.9%	13.9%	27.9%
TOTAL	54.7%	45.3%	100.0%

These data reveal that there was a slight majority of workshop participants who conducted additional workshops or assisted their colleagues in the Project's method of archery instruction.

Table 7 provides a comparison of elapsed time and the conducting of workshops or the assisting of colleagues in the Project's method of archery instruction.

TABLE 7.--Distribution of workshop participants conducting workshops or assisting colleagues with archery instruction in relationship to a time lapse.

Assisted or Conducted	Prior Instruction	Months Elapsed Since Attending Workshop				Totals	
		11 or less months	12-23 months	24-35 months	36-47 months	48-52 months	
YES	YES	10.9%	16.4%	12.7%	14.5%	20	74.5%
	NO	2.7%	10.0%	7.3%	2.7%	2.7%	54.7%
NO	YES	17.6%	18.7%	14.3%	12.1%	6.6%	69.2%
	NO	7.7%	11.0%	6.6%	2.2%	3.3%	45.3%
							30.8%

The time elapsed since attending the workshop does seem to indicate that more participants conducted workshops or helped colleagues as time increased. The second highest percentage, however, appears in the 12-23 month category.

In both categories, that of assisting or conducting workshops and those who did not assist, those with prior experience had the higher percentage.

It should be noted, however, that one individual, interviewed by telephone, on a state department of education staff revealed some 20 state archery workshop instructors had conducted between 30-40 inservice archery workshops. This was the result of a Project workshop and had ultimately involved between 600-700 physical education teachers receiving instruction.

Table 8 shows the relationship between experience prior to the workshop and the respondents reported expansion or plans to expand their program to include all or portions of this method of teaching archery.

TABLE 8.--Participants who plan to expand or have expanded their programs to include all or portions of method of instruction.

Prior Instruction	Expansion or Planned Expansion		
	Yes	No	Total
YES	65.3%	7.7%	73.1%
NO	23.8%	3.1%	26.9%
TOTAL	89.1%	10.9%	100.0%

The majority of both categories (with and without prior archery instruction) reported the expansion or planned expansion of their archery programs after having attended the Project's archery workshop. Thus the participants reported that their intentions were action oriented.

Table 9 provides the comparison of expansion or planned expansion in relation to the elapsed time since attending the Project's archery workshop.

There appears to be no relationship between the elapsed time and the expansion or planned expansion of programs by the workshop participants. Expansion occurs in almost equal proportions with those participants having prior instruction. Of the 193 respondents answering the question on program expansion 172 (89.1%) responded positively.

The basic instruction of archery in schools, colleges, and recreation programs is by necessity based on group instruction as opposed to a one-to-one teaching format. Question seven asked the participants if they were better equipped to offer group archery instruction as a result of participation in the workshops. Table 10 presents the response to question seven.

The respondents indicate almost total agreement that as a result of the archery workshop they were better equipped to offer group instruction. This portion of the Project's method of instruction was clearly understood and it apparently had a positive effect on the respondents.

TABLE 9.--Participants who plan to expand or have expanded their programs to include all or portions of method of instruction in relationship to elapsed time.

Expansion	Prior Instruction	Months Elapsed Since Attending Workshop					Totals
		11 or less months	12-23 months	24-35 months	36-47 months	48-52 months	
YES	YES	14.0%	18.6%	14.0%	13.4%	13.4%	73.3%
	NO	5.8%	9.9%	7.0%	2.3%	1.7%	26.7%
							89.1%
NO	YES	14.3%	9.5%	14.3%	19.0%	14.3%	71.4%
	NO	0.0%	9.5%	9.5%	0.0%	9.5%	28.6%
							10.9%



TABLE 10.--Participants reporting they were better equipped to offer group instruction after workshop.

Prior Instruction	Better Group Instruction		
	Yes	No	Total
YES	69.1%	1.5%	70.6%
NO	28.9%	0.5%	29.4%
TOTAL	98.0%	2.0%	100.0%

The next question asked of the participants was if, as a result of their experience at the workshop, their archery program improved. This, of course, is a major reason for providing the archery workshops. Table 11 provides the data from this question.

TABLE 11.--Participants opinion on their program improvement as a result of their workshop experience.

Prior Instruction	Program Improvement		
	Yes	No	Total
YES	60.5%	10.0%	70.5%
NO	26.8%	2.6%	29.5%
TOTAL	87.4%	12.6%	100.0%

The overwhelming majority of respondents reported an improvement in their archery program as the result of the workshop experience. This is accepted as evidence that the workshop satisfied an instructional need of the workshop participants.

A comparison of program improvement and the effect of elapsed time is shown in Table 12.

The respondents report program improvement in almost equal proportions over the elapsed time since attending the Project's workshop. This indicates almost immediate inclusion into their programs of the knowledge gained at the workshop.

In question nine the participant was asked for his overall comments on the method used in the Project's archery workshop.

Sixty-three used such adjectives as: "excellent," "great," "fantastic," "best ever," and several indicated they were adapting the "immediate participation-immediate success" premise to other activities.

Eighty-four responded with "very good," "very effective," "instruction clear and concise," "after instructing archery for 30 years I've changed" and "very commendable."

Forty-one indicated the method was "good," "well handled," "interesting," "it works for my students," "I gained many good instructional ideas and games" and "beneficial and well done."

A total of 188 of the 203 respondents indicated a positive perception of the method of instruction.

TABLE 12.--Participants opinion on their program improvement as a result of their workshop experience in relationship to a time lapse.

Program Improvement	Prior Instruction	Months Elapsed Since Attending Workshop					Totals	
		11 or less months	12-23 months	24-35 months	36-47 months	48-52 months		
YES	YES	13.9%	18.1%	12.6%	12.0%	12.6%	69.3%	87.4%
	NO	4.8%	10.8%	9.0%	3.0%	3.0%	30.7%	
NO	YES	16.7%	12.5%	8.3%	16.7%	25.0%	79.2%	12.6%
	NO	8.3%	4.2%	4.2%	4.2%	0.0%	20.8%	

Five did not approve of the method while providing the following comments: "I prefer the low anchor point and free style shooting," "I don't approve of the high anchor point or shooting at animal pictures--what are we trying to teach our children," "not an efficient approach," "not effective for group instruction" and "boo."

Ten respondents failed to answer the question.

The comments of those interviewed by telephone were as follows: "very adequate, I liked the immediate participation-immediate success as it reduced the lecturing," "immediate success is great, you don't get discouraged," "it's the only method to use," "the freedom or flexibility of shooting different ways is an individual choice," "excellent, it's changed the outlook of archery," "excellent, simplified, established shooting routine by using the ten step method," "simple to use and follow, it's self explanatory," "dual shooting methods good, more work done on different types of archery" and "should have more workshops."

In question ten the respondents were asked what aspects of the method used in the workshop should be changed, if any.

Ninety-six responded "no changes should be made."

Forty-nine did not respond to the question which totals 145 without any suggested changes. A total of 58 respondents provided the following suggestions for workshop changes.

Twelve respondents indicated a desire to have the length of the workshop extended from the present three-day period (an example of a three-day workshop is found in Appendix E).

Five respondents requested a repair of equipment session and five respondents requested more time on coaching (student coach/shooter method).

Four respondents suggested ability grouping early in the instruction.

There were two categories with three respondents that suggested: more information on causes of errors and more effective equipment.

The rest of the comments included: more visual aids, more workshops, more time at shorter distances, shooting at greater distances, no anchor point change and more advanced techniques.

Four of the ten interviewed by telephone responded, to the same question, with "no change." The remaining six provided the following comments: "separate beginners and advanced shooters, the advanced archer doesn't need as much shooting," "younger archers sometimes have difficulty understanding the pre-gap," "within the allotted time it's good," "provide time for equipment repair," "have an expert bare bow shooter demonstrate" and "have different length workshops with longer ones for indepth sessions."

Through the reported data the participants indicate the expansion of or planned expansion of their archery programs to include a portion or all of the Project's method of instruction, improved program as the result of experiences at the workshop and better ability to offer group instruction in archery. This indicates that learning affected the majority of the participant's behavior as the result of their experiences at the Project's workshop.

### Summary

The purpose of this descriptive case study was to examine and describe the Outdoor Education Project's workshops for developing leaders of instruction and program development in the leisure skill of archery.

Specifically the data in this chapter provides information to these important questions:

1. Has the learning affected the participant's behavior as evidenced by his use of his newly acquired knowledge in his program?
2. What advantages of this method of instruction were perceived by the participant?
3. What evidence indicates that needs were satisfied by this method of instruction?

The subjectivity of the questionnaire was, to some extent, offset by the observed agreement between the telephone interview and the self reported data.

### Findings

1. There was little indication that workshop participants attended subsequent archery instruction.
2. In general about half the participants indicated they assisted colleagues with archery instruction.
3. A large majority of the respondents indicated expansion or planned expansion of their archery programs to include all or portions of the workshops method of instruction without any apparent relationship to the elapsed time.
4. An overwhelming majority of respondents indicated they were better equipped to offer group instruction as a result of their experiences at the Project's workshop.

5. In the opinion of over 87 percent of the respondents their archery programs improved after attending the Project's workshop with the elapsed time indicating almost immediate effect.
6. Over 92 percent of the respondents reported a positive point of view when asked for their overall view of the method used in the Project's archery workshop.
7. Over 71 percent of the respondents, when asked, had no suggested changes in the method used in the workshop.
8. The respondents indicated that group instruction and the "immediate participation-immediate success" premise were advantageous.

The last question related to equipment used by the participants in their programs. The results of this question on both surveys can be found in Appendix F.

Chapter VI presents the conclusions, summary and recommendations of this dissertation.

FOOTNOTES: CHAPTER V

<sup>1</sup>One telephone respondent is presently teaching on the university level but answered the questions from experience as a graduate student and while on the university faculty.

<sup>2</sup>This person retired at the end of the 1972-73 school year but has remained active as a substitute teacher and in archery instruction.

<sup>3</sup>Totals will not equal 203 because respondents reported multiple teaching level categories.



## CHAPTER VI

### SUMMARY, CONCLUSIONS, RECOMMENDATIONS

#### Summary

The purpose of this study has been to examine and to describe the Outdoor Education Project's archery workshops for developing leaders of instruction and for a continuing education program in the leisure skill of archery. The study covered in time the period from 1960 to February of 1973. In Chapter II, three contributing areas to a successful continuing education program were reviewed and provided a series of questions that served as a guide in the examination and description of the Project's archery segment. Those areas included were: the development of a continuing education program, principles of learning, and the essential elements of an innovative method of instruction.

The data for the study were collected from two sources: personal testimony and written records. The written records data were retrieved from the Outdoor Education Project's files. The personal testimony data were retrieved from participants of the Outdoor Education Project's archery workshops.

A questionnaire was sent to participants of the Project's workshops between the periods of 1969 and February, 1973. To balance the subjectivity of the responses to the questionnaire, a taped telephone interview was also conducted.

Chapters IV and V contain the findings of this study.

### Conclusions

The self reported data indicated that the Outdoor Education Project's archery workshops contributed to the continuing education of the participants in the leisure skill of archery by: expanding or planning to expand their archery programs to include portions or all of the Project's method of teaching archery; development of a positive perception of the method of instruction; improved ability to offer group instruction in this method to other learners, youth and adult.

In analyzing the written records and in interpreting the self reported data, the features and procedures that contributed to the effectiveness of the Outdoor Education Project's workshops as indicated above were:

1. Workshop goals and objectives were established by an Advisory Committee and through continuous consultation with experts in archery.
2. A broad based communication system was used which promoted the archery workshops through (a) the professional publications of the American Alliance for Health, Physical Education and Recreation, (b) state department of education channels, (c) State Associations for Health, Physical Education and Recreation, (d) the Outdoor Education Project's Newsletter and special announcements and (e) archery periodicals.
3. Evaluation of the strengths and weaknesses of the planned workshops from (a) the Advisory Committee, (b) through verbal and written evaluations by the participants and (c) from three research studies were fed back into the planning sessions.
4. The goals and objectives of the Outdoor Education Project's archery workshops were presented orally to the participants at orientation sessions.

5. Capitalizing on the participants desire for immediate participation, e.g. to shoot a bow, as the basic component of the instructional method. The instructional procedure provided opportunities for immediate success, e.g. shooting from a close distance at a large target.

### Recommendations

As a result of this study, two sets of recommendations are made. The first is relative to continuing education programs for adults whose objective it is to impart psychomotor skills which have application to life-long learning activities. The Outdoor Education Project of the American Alliance for Health, Physical Education and Recreation is an example of a national professional educational organization concerned with an inservice education program for leisure related psychomotor skills for adults. The second category of recommendations are in the form of guidelines for life-long learning. They represent a synthesis of three characteristic aspects of study of the Outdoor Education Project described in Chapter I, and are drawn from the review of the literature in Chapter II and from the personal testimony and written records in Chapter III.

- A. To continuing education programs for adults concerned with leisure skills.
  1. There should be continuous inservice education programs for adults in preparation for new and updated educational programs, particularly those which include psychomotor activities. The study shows that new methods of teaching, such as used in the Outdoor Education Project's archery workshops are effective for adult leaders.

2. To increase their effectiveness, continuing education programs such as the Outdoor Education Project workshops, should consider the use of group instruction in the teaching of leisure skills to adults.
3. Short intensive learning sessions, such as the Outdoor Education Project's workshops, should be conducted in local communities and regions for adults who wish to learn skills such as archery.
4. The American Alliance for Health, Physical Education and Recreation should expand its inservice programs for its membership at state, district and national levels through such means as the Outdoor Education Project.
5. The Outdoor Education Project's workshops should be broadened to include a variety of leisure skills and their availability to increasing numbers of teachers and community education leaders.

#### B. Some Guidelines for Life-long Learning

1. The setting for successful learning experiences has several basic qualities; friendliness, sincerity and the warmth of the leader and the participants.
2. In adult learning where attitudes and habits are already strongly formed, change in behavior can be affected by perceptive experiences. The situation that is perceived as a valuable experience is when the learner sees himself as adequate and effective in a given situation.
3. Adults need security and support to relax a defensive posture. There is often a natural resistance to change by adults in motor behavior which is more easily overcome when other individuals in the group accept it at the same time.
4. The goals and objectives to be reached by the learner must be clear, understandable and personal. They must be seen as contributing to the maintenance and the enhancement of the self.

5. Immediate participation and instant success are essential in learning motor skills. Learning builds on learning the way success builds on success.
6. Meaningfulness influences both learning and retention. In teaching motor skills to leaders specifically and to adults generally, the immediate use of the skills in teaching or in participation in the sport for pleasure, contributes to rapid and effective learning.
7. Recognition that the types of learning vary with individuals, as does the rate of learning, is a major factor in teaching motor skills to adults. The workshop method, using group instruction and coaching techniques, provides maximum opportunities for individuals to proceed at their own rate. As they achieve success, component skills can be improved. Eventually, some of the generally accepted body mechanics and forms can be modified to meet individuals varied learning needs.
8. Learning a skill is influenced by the opportunities to evaluate progress. The opportunity to compete against one's self, particularly, which can be done more easily in individual activities, is an important type of self evaluation.
9. The use of the coaching method, accompanied by group discussions, and fun competition is an effective form of immediate evaluation.
10. There should be evaluation through research studies, of the effectiveness of continuing education programs that include leisure skills, as measured by the voluntary pursuance of the skills involved, individually or in clubs and other organizational pattern.
11. There is need for well designed and innovative continuing education programs for the learning and the use of leisure skills. This hypothesis is supported by examining the characteristics of the Outdoor Education Project workshops as they relate to attributes of innovations described in Chapter II.
12. Appropriate instructional equipment and materials in continuing education programs are important factors, particularly in motor skills where performance depends heavily on proper equipment and effective instructional guides. The types of archery equipment, for example, used in the Outdoor Education Project workshops, helped the participants concentrate on form, as well as

achieving immediate success in hitting the target. The archery manual described the processes, forms and procedures used in the workshops, which constituted immediate reinforcement through discussion and review of the instruction.

13. Continuing education programs should make maximum use of the talents and experiences of all the resource leaders available such as those in the community, professionals or laymen with special interests, and experts from government, voluntary agencies and industry. This use of human resources, as well as available facilities, equipment and instructional materials is illustrated by the Outdoor Education Project workshops, and has implications for other continuing education ventures in the leisure skills.

### Suggestions for Further Study

Several suggestions are offered for further study of continuing education programs, particularly for those that include leisure skills.

1. A cost effective study of the intensive workshop method of continuing education versus other forms of inservice education relative to the number of learners reached.
2. To determine the degree to which the credibility of a sponsoring agency of an inservice program, relative to the goals of the program, materially affects the success of the inservice program.
3. A study should be conducted that can identify the conditions and the individuals in educational systems which would maximize the adoption and dissemination of new programs or methods of instruction.
4. That an attempt be made to determine the level and area of speciality needed by workshop instructors in order to make the workshop a success.
  - a. What determines a specialist
  - b. What areas should they be prepared to discuss (i.e. must be able to speak to the underlying principles on which the method is based or merely how to use the method).

5. A study to more clearly identify the critical elements of the decision-implementation process for continuing education programs in leisure skill activities.
6. A study to determine the effectiveness of the short intensive workshop pattern with other psychomotor activities usually taught in longer periods such as a semester.
7. A longitudinal study for those taught by workshop participants in terms of the continued interest and involvement in the particular activity.

#### Concluding Statement

This study has focused on one project and its contribution to continuing education for adult leadership specifically and for adult learners generally. However, the findings and recommendations are applicable to educational agencies concerned with continuing education at the community, state and national levels.

It is significant, especially in the acquisition of leisure skills, such as archery, by adults, that psychomotor learning is visible to the instructor and to the group as contrasted with much of cognitive learning that requires little, if any, motor involvement. This is an important factor to consider in the design of continuing education programs for adults. The workshop pattern examined in this study and the evidence of its effectiveness is confirmed by those who have participated in the workshops.

This study demonstrates that through continuing education programs, adults, whether they be teachers and leaders, or consumers of leisure, can learn new motor skills. With the concerns about sedentary living and about the lack of exercise by many adults, this study becomes more important and timely.

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## APPENDICES

APPENDIX A

INQUIRY CONCERNING RESULTS OF ARCHERY  
INSTRUCTORS WORKSHOPS

## APPENDIX A

### INQUIRY CONCERNING RESULTS OF ARCHERY

#### INSTRUCTORS WORKSHOPS

According to our records you have attended an Archery Instructors Workshop or clinic conducted or co-sponsored by the Outdoor Education Project, which offered a systematic method of group instruction in archery--including Ten Steps in shooting and emphasis on "immediate participation"--shooting within the first hour; "immediate success"--using light weight equipment with large targets placed at short distances.

1. Did you have any archery instruction prior to the workshop?
2. Have you had any archery instruction subsequent to the workshop?
3. Are you currently responsible for instructing or coordinating instruction in archery?
4. Grade levels in which you teach archery:  
\_\_\_\_K-3    \_\_\_\_4-6    \_\_\_\_7-9    \_\_\_\_10-12    \_\_\_\_college    \_\_\_\_adults
5. Since the workshop, have you conducted any workshops/clinics for teachers--or assisted any colleagues in archery instruction?
6. Have you, or do you plan to, expand your program to include all or portions of this method of teaching archery?
7. Do you feel, as a result of the workshop, that you are better equipped to offer group instruction in archery?



8. In your opinion, has your archery program improved as a result of your experience at the workshop?
9. What are your overall comments on the method used in the workshop you attended?
10. What aspects of the method used in the workshop should be changed, if any?
11. What type of equipment do you use in your program?

BOWS: \_\_\_\_fiberglass \_\_\_\_laminated \_\_\_\_other-specify\_\_\_\_

draw weights of bows (give range)\_\_\_\_\_

ARROWS: \_\_\_\_wood \_\_\_\_fiberglass \_\_\_\_aluminum

INSTRUCTION IS CONDUCTED: \_\_\_\_indoors \_\_\_\_outdoors

DO YOU USE A BACKSTOP NET? \_\_\_\_Yes \_\_\_\_no

## APPENDIX B

### LETTER TO WORKSHOP PARTICIPANTS

APPENDIX B

LETTER TO WORKSHOP PARTICIPANTS

April 3, 1973

Dear Archery Workshop Participant:

In looking to the future, an effort is being made to evaluate the effectiveness of the archery program of the Outdoor Education Project. We are asking you, as one who has participated in an archery instructors workshop or clinic in which the Project has been involved, to give your reaction to the questions in the enclosure.

Your professional contribution and time in completing the survey form and returning it in the enclosed envelope by April 25, will be of great help in appraising the effectiveness of our efforts in archery and in planning future activities.

JULIAN W. SMITH

FRED SCHUETTE

## APPENDIX C

### TELEPHONE INQUIRY

## APPENDIX C

### TELEPHONE INQUIRY

To establish that you are speaking from a personal observation the question to be asked is "Have you observed the use of the Outdoor Education Projects' archery workshop method of instruction?"

\_\_\_\_\_ Yes

\_\_\_\_\_ No

The following questions are based on the premise that the answer to the preceeding question was Yes.

1. In what professional capacity did you observe this method of instruction?
2. In what setting (educational or recreational) did you observe this method of instruction, other than at a workshop.
3. Are you aware of the expansion of programs that include all or portions of this method of teaching archery?
4. Do you feel, as a result of the OEP Archery workshops, that instructors are better equipped to offer group instruction in archery?
5. In your opinion, have the archery programs improved as the result of the experience at the workshop?
6. What are your overall comments on the method used in the Outdoor Education Projects' archery workshop?
7. What aspects of the method used in the workshop should be changed, if any?

8. What type of equipment is used in the program you observed?

BOWS: fiberglass\_\_\_\_ laminated\_\_\_\_ other-specify\_\_\_\_\_

draw weights of bows (give range)\_\_\_\_\_

ARROWS: wood\_\_\_\_ fiberglass\_\_\_\_ aluminum\_\_\_\_

INSTRUCTION IS CONDUCTED: indoors\_\_\_\_ outdoors\_\_\_\_

IS A BACKSTOP NET USED: Yes\_\_\_\_ No\_\_\_\_

APPENDIX D

LETTER OF PERMISSION

APPENDIX D

LETTER OF PERMISSION

March 30, 1973

Mr. Fred Schuette  
618 Chalmers  
Flint, Michigan 48503

Dear Mr. Schuette:

We received your letter of March 23, 1973 requesting permission to reprint portions from the book Archery--A Planning Guide for Group and Individual Instruction.

You have our permission to use the material from the book with proper credit and identification. We request that you use the credit line, "Reprinted from Archery--A Planning Guide for Group and Individual Instruction with permission of the American Association for Health, Physical Education, and Recreation, 1201 Sixteenth Street, N.W., Washington, D.C. 20036."

Sincerely yours,

William L. Cooper  
Director of Publications



APPENDIX E

OUTDOOR EDUCATION PROJECT

THREE DAY ARCHERY WORKSHOP

## APPENDIX E

### OUTDOOR EDUCATION PROJECT

#### THREE DAY ARCHERY WORKSHOP

The archery workshops have extended over a three day period, starting the afternoon of the first day and ending at noon of the third day. This permitted two afternoon sessions, two evening sessions, and two morning sessions.

#### I. Session One

##### A. Registration

##### B. Introductions, Welcome

##### C. Workshop Objectives

1. Ten step method of instruction
2. Equipment: cost, storage, repair
3. Free style and instinctive shooting
4. Target, field and archery games
5. Adapting archery to existing facilities
6. Instructional materials
7. Program development
8. Archery safety
9. Archery organizations

##### D. Basic Instruction

1. Eye dominance
2. Issue equipment

3. Target assignment
4. Shoot first arrows
5. Student coach/shooter

## II. Session Two

### A. Discussion

1. Equipment
  - a. light draw weight bows (20 and 25 pounds)
  - b. bow materials
  - c. costs of bows
  - d. arrow materials and costs
  - e. wrist guards and finger protectors
  - f. target matts
2. Safety
  - a. procedures with equipment
  - b. procedures on range
3. Instructional resources
  - a. books, posters and instructional guides
  - b. films, film loops and video tapes

### B. Review of ten step method of instruction

1. Use of key words
2. Importance of shooting pattern
3. Emphasis positive-correct shooting procedure
4. Stress of correct fundamentals not hitting target center
5. Student coach/shooter procedure

### III. Session Three

- A. Review ten steps
- B. Shooting at various distances using
  - 1. Student coach/shooter procedure
  - 2. Pre-gap method of shooting with high anchor point
  - 3. Different target faces
- C. Discussion

### IV. Session Four

- A. Student coach/shooter with emphasis on correcting individual problems
- B. Free Style Shooting
  - 1. Low anchor point
  - 2. Varied distances and target faces
- C. Allow each participant to choose their style of shooting
- D. Discussion on styles of shooting and techniques to this point
- E. Explain procedures and shoot two tournament rounds
  - 1. Modified Chicago Round
  - 2. Modified Flint Round
- F. Unstring and string bow
  - 1. Safety of individual and bow
  - 2. Step through method
  - 3. Bow stringer method

## V. Session Five

### A. Discussion

1. Program development
  - a. equipment costs, storage and repair
  - b. resource materials
  - c. adapting existing facilities
  - d. archery organizations
  - e. intramural archery program
2. Review and discussion of workshop to this point

### B. Repair session

1. Make an arrow
2. Make a bow string

## VI. Session Six

### A. Archery games (as many as time and facilities permit)

1. Field archery
2. Archery golf
3. Clout shooting
4. Tic-tac-toe
5. Bird and Rabbit shoot
6. Wand shooting
7. Bow fishing

### B. Final discussion

1. Participants suggestions and comments
2. Workshop evaluation
3. Presentation of awards

Between each session practice shooting is allowed on the target. An instructor must be present, however, to emphasize range safety and to assist the participant where it is necessary.

## APPENDIX F

TYPE OF ARCHERY EQUIPMENT BEING USED BY  
THOSE HAVING ATTENDED AN OUTDOOR  
EDUCATION PROJECT'S ARCHERY  
WORKSHOP

## APPENDIX F

### TYPE OF ARCHERY EQUIPMENT BEING USED BY THOSE HAVING ATTENDED AN OUTDOOR EDUCATION PROJECT'S ARCHERY WORKSHOP

The last question on the questionnaire and the telephone interview was an attempt to determine the type of archery equipment being used in the archery programs and where instruction took place. The answers to both the telephone interview and the self reported data are presented together for comparison.

There were 26 non respondents to the last question with an additional number of individuals failing to answer portions of the question.

Table 13 indicates the types of bow (bow material) that are being used in the archery programs. The fiberglass bow is the less expensive type and the laminated (composite) the more expensive type. A number of respondents indicated they were using both types of bows in their programs.

The next portion of the question asked for the draw weight being used in the archery programs. The category with the largest number of responses from the questionnaire was the 15-50 pound category, indicating most programs have a variety of bow draw weights covering a wide range.



TABLE 13.--Types of bows used in archery programs as reported by the Project's workshop participants and telephone interviewees.

Response to:	Bow Types			
	Fiber Glass Bow	Laminated Bow	Both	Total
Questionnaire	62.7%	18.6%	18.6%	100%
Telephone	30 %	0 %	70 %	100%

TABLE 14.--Bow draw weights used in archery programs reported by the Project's workshop participants and telephone interviewees.

Response to:	Bow Draw Weights				
	15-25 Pounds	26-35 Pounds	36 Pounds and over	15-50 Pounds	Total
Questionnaire	22.4%	11.8%	0.6%	65.2%	100%
Telephone	40 %	10 %	0 %	50 %	100%

Next the type of arrow (material) being used in the archery programs was asked of the respondents. There are three materials used: wood, fiberglass and aluminum. That order also reflects the order of the cost from the least to most expensive. A number of programs used a combination of arrow types.

The cost of arrows appears to influence the types used in the majority of programs.

TABLE 15.--Types of arrows used in archery programs as reported by the Project's workshop participants and telephone interviewees.

Response to:	Arrow Types					Total
	Wood	Glass	Aluminum	Wood and Glass	Glass and Aluminum	Wood, Glass Aluminum
Questionnaire	66.7%	14.6%	0.5%	9.9%	1.8%	4.7%
Telephone	60 %			40 %		
						100%

Archery has traditionally been an outdoor activity, however, with the introduction of shooting short distances, portable targets and the use of backstop materials such as nylon nets it is more feasible to include it as an indoor activity. The last question also attempted to assess where the archery programs were conducted.

As shown in Table 16 almost one half of those responding to the questionnaire included archery instruction indoors, however, the telephone responses reflected even more programs using indoor archery.

TABLE 16.--Location of archery programs as reported by the Project's workshop participants and telephone interviewees.

Response to:	Location of Programs			
	Outdoor	Indoor	Both	Total
Questionnaire	54.5%	17.4%	28.1%	100%
Telephone	10 %	10 %	80 %	100%

The final item asked was if a backstop net was used in the archery program. The backstop net (usually the commercial nylon type) not only allowed archery programs to be conducted indoors but made it possible for areas to be used outdoors that were once unsuitable as an archery range.

Table 17 shows almost one half of the questionnaire respondents using a backstop net and a greater number of those responding to the telephone interview.

TABLE 17.--Backstop net used in archery programs as reported by the Project's workshop participants and telephone interviewees.

Response to:	Use of Net		Total
	Yes	No	
Questionnaire	44.1%	55.9%	100%
Telephone	80 %	20 %	100%

## APPENDIX G

### ARCHERY--A PLANNING GUIDE FOR GROUP AND INDIVIDUAL INSTRUCTION<sup>\*</sup>

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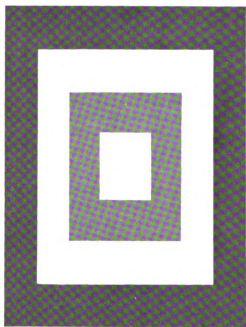
<sup>\*</sup>Used with permission of the American Association for Health, Physical Education and Recreation, 1201 Sixteenth Street, N.W., Washington, D.C. 20036.

# archery



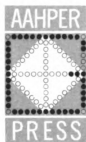
A PLANNING GUIDE FOR GROUP  
AND INDIVIDUAL INSTRUCTION

# archery



## **A PLANNING GUIDE FOR GROUP AND INDIVIDUAL INSTRUCTION**

Prepared by the AAHPER Committee under the Supervision of  
Julian W. Smith  
Director, AAHPER Outdoor Education Project



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1201 Sixteenth Street, N.W., Washington, D.C. 20036



# foreword

This manual is one of a series of AAHPER publications prepared by the Outdoor Education Project. It is based largely upon the successful teaching methods in group instruction gained through many archery workshops and clinics. The manual is designed to provide practical suggestions for initiating group and individual archery instruction in physical education and recreation classes in schools and colleges, and in programs conducted by camps, recreation departments, and other agencies concerned with teaching skills and sports that have lifetime interests for increasing numbers of people.

Like other AAHPER instructional materials, the first draft of this manual was prepared by a committee of experienced teachers and leaders in archery and was subsequently field tested in hundreds of workshops and clinics and submitted to other experienced archery instructors for suggestions.

AAHPER gratefully acknowledges the cooperation of the American Archery Council in supporting the archery segment of the Outdoor Education Project which has been responsible for initiating and developing archery instruction in many schools, colleges, and recreation agencies. Special recognition is given to the following committee members who assembled the materials and methods presented in this manual:

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# introduction

The increasing importance of the constructive use of time is a challenge to schools and recreation agencies to provide opportunities for people to acquire interests and skills that have lifelong values. Archery, long recognized as a valuable and satisfying sport, is growing in popularity as an individual and family activity.

In order to provide opportunities for people of all ages to learn the basic skills underlying all forms of archery, group instruction is necessary. In schools, colleges, and public agencies particularly, archery instruction should be available to all students and participants.

In every group, archers will exhibit a wide range of physical characteristics, muscular coordination, and experience. Some procedures for archery instruction presented in this manual are based on the principle that all who desire to learn the skills should have equal opportunities to develop their own interests and abilities, and that sufficient space, facilities, and equipment should be provided.

Two important ingredients in effective group instruction for beginners are *immediate participation* and *immediate success*. This is in keeping with the fundamental principles of learning. Review, correction of faults, and adaptation to individual differences with practice and coaching normally follow as in teaching all skills.

This manual presents a method of group instruction especially designed for beginning students, with provisions for progression in competence for engaging in many types of archery activities suited to the students' interests. There is much more detailed information about many aspects of the sport which can be found in many excellent reference materials (see Bibliography, p. 63).

Those who teach archery should possess reasonable skill and the ability to employ effective instructional techniques. In too many instances, unqualified individuals have been "drafted" to teach archery. In these situations in-service education is vital. An increasing number of in-service workshops, clinics, and special classes are offered by the Outdoor Education Project of AAHPER, colleges and universities, professional associations, and other groups.

It is hoped that this manual will be helpful to all who have the opportunity to teach archery in schools and colleges, recreation and camp agencies, and adult groups.

# facilities

## INDOOR FACILITIES

### Shooting Area

Areas that can be used for shooting include a gymnasium floor or balcony, a band room, a stage, a furnace room, a multipurpose room, or wide corridors. Although an area that measures 90 by 90 feet is ideal for the average beginning class, this is not always possible. An area of 30 by 50 feet is satisfactory; it can accommodate as many as 10 36-inch target matts and 40 shooters. If space is limited, however, classes can be conducted effectively in a smaller area.

### Targets

#### Target matts.

The types of target matts available are round matts of Johnson grass or straw, and square matts of excelsior or plastic foam. *Excelsior or straw matts that are used indoors must be fireproofed.* This manual suggests 36-inch matts because they are a practical size for instruction and are lighter in weight and easier to handle than a larger target. The newer plastic foam matts are especially portable and practical where targets must be taken in and out-of-doors for each shooting session.

#### Target faces.

For basic instruction it is suggested that target faces be 36 inches (or same size as matts being used) and four-color (five rings—gold, red, blue, black, white). If possible, a paper target face should be glued to corrugated board (cardboard) before attaching the face to the matt; this will increase the target life many times. Faces can also be purchased with cardboard backing.

Target faces are attached to the matt with commercial target pins or pins made from clotheshanger wire or equivalent. Use a piece of wire 14 inches long for each pin. Make a right angle at 3 inches and bend the 3-inch piece so that it is curved. Put the remaining 11 inches of the wire through the target face and matt and bend it at the back. There should be four pins in each target face.

#### Target installation.

Target matts are placed on stands or are held in place by wires or ropes. This can be done by attaching wire loops to the top of each matt and stringing the loops onto a wire or rope that is attached very securely to standards (such as badminton or volleyball) anchored to the floor, or to hooks anchored in the wall. The top of the target matts should be angled slightly backward. If a matt should fall, it will then fall backward and thus not break arrows that might be in the target.

#### Target arrangement.

The instructor's position in relation to the targets and the shooting line during an archery class is of utmost importance. The targets should be arranged so that when students are facing the targets, the instructor will be to the right of them. This will allow the instructor to stand a few feet to the right of the shooting line to observe the shooters and to be heard by all students. Each right-handed shooter will then be facing the instructor when in position at the shooting line.

14 in.



Pins

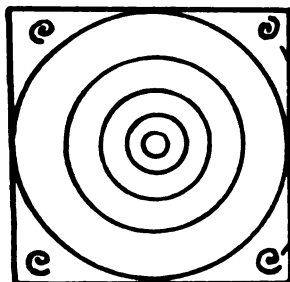
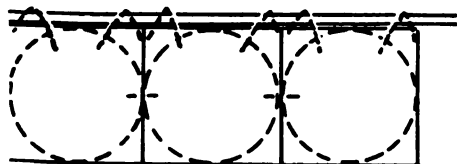


Figure 1. Target pins.

wire or rope



Solid lines represent square matts; dotted lines represent round matts. Round matts could be wired to each other at the sides.

Figure 2. Set-up of target matts indoors.

## Shooting Line

To designate the shooting line, floor marking tape or masking tape should be placed on the floor 20 feet (and/or other desired distances) from the base of the targets. If tape is impractical or unavailable, a rope or measuring tape may be used.

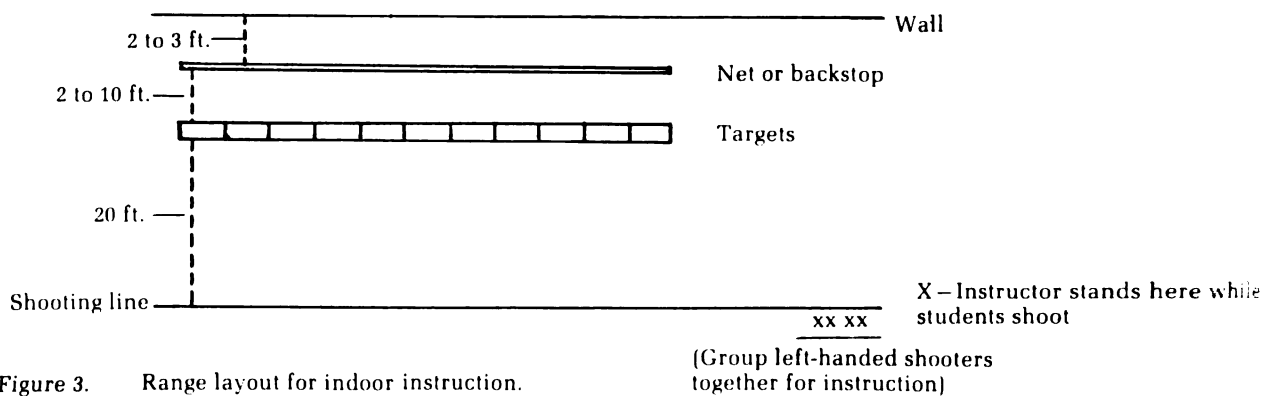


Figure 3. Range layout for indoor instruction.

## Backstop

A backstop should be hung 2 to 3 feet from the wall and 2 to 10 feet behind the targets to prevent arrows from hitting the wall. Suitable backstops include commercial nylon backstop nets which are very effective in stopping arrows; an old rug or series of rugs or moving van carpets; parachutes; canvas; or cellotex. If a cellotex board is used, a minimum of 8 feet should be allowed between the targets and the backstop. If a fabric backstop is used, it should be attached at the top only to allow flexibility to absorb the shock of the arrows and prevent penetration.

Any indoor backstop should be a minimum of 8 feet from the top to the floor. If there is concern about the possibility of arrows hitting and damaging the floor in front of the targets, such as in a gymnasium, it is helpful to rest the targets on rubber runners, canvas-covered tumbling mats, or a rug extended 6 to 8 feet in front of the targets. Beginning students, however, tend to shoot high, so generally there is little need to worry about damaging the floor.

**Point of Safety.** Whenever possible, arrange facilities so that there is no possibility of nonparticipants inadvertently walking behind the targets while shooting is in progress. In the event a path of traffic must cross the room, secure a restraining rope diagonally from the shooting line to the targets with a distance of 6 to 8 feet beyond the end of the shooting line and a distance of 12 feet beyond the target line.

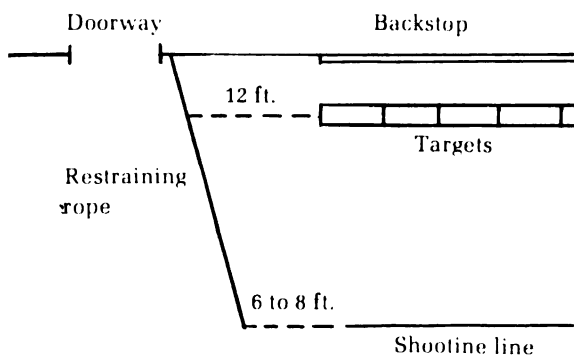


Figure 4. Indoor range showing safety restraining rope.

## OUTDOOR FACILITIES

### Shooting Area

Use any outdoor area on the school site—the football field, practice field, hockey field, playground, or tennis court. Safety must be the prime factor in all instances. Grass or dirt surfaces are preferable, but not necessary.

### Target Installation

The range set-up is basically the same as indoors, with a few exceptions. Wire loops should be secured through the sides of the target matts rather than through the tops of the matts, with metal or wooden stakes or posts placed through the loops and anchored securely in the ground.

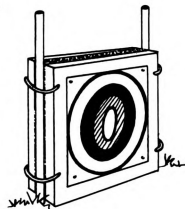


Figure 5. Set-up of target matt outdoors.

### Non-permanent targets.

When targets must be installed and removed for each archery class, the movable kind is recommended. They can be set up in the following manner:

Pipes that are 2 feet long and 1½ inches in diameter should be spaced 38 inches apart and driven into the ground until the top end of each pipe is slightly below the surface of the ground.

Prior to each class, the instructor and/or students can insert a pipe or stake that is 5 feet long and 1 inch in diameter into each of the recessed pipes and secure the target matts to the pipes or stakes by attaching two wire loops on each side of the matt and sliding the loops onto the pipes or stakes (see Figure 5).

If desired, the recessed pipes can have a threaded end so that a cap can be placed over the pipe opening. This will prevent rain and debris from falling into the pipes when the range is not in use.

Commercial movable target stands can also be used. Tripods can be used, although they are more cumbersome to transport and set up. In an outdoor range, the tripods should be anchored. Another idea for target stands is to use track hurdles upside down and wire the matts to the legs.

### Permanent targets.

Permanent targets can be installed in the following manner:

Each target will require two supports. The supports should be approximately 6 feet long and can be of the following materials: 1-inch pipes, 2½-inch cedar posts, 2- by 4-inch wooden stakes, or steel fence posts. Stakes should be driven into the ground 38 inches apart and to a depth of at least 2 feet. An old rubber tire or 2 by 4s should be placed on the ground between the two supports.

The bottom bale of excelsior or straw should be placed on top of the tire or 2 by 4s so that it does not rest on the ground. This preserves the bales and eliminates arrows sliding underneath. Two more bales should be stacked on top of the first, and all three bales should be banded together by using a banding tool or two straps of No. 8 wire. This is done by completely encircling the bales and tightening the wire. If four or five bales are desired, the target supports should be within 6 inches of the top. Supports should never extend higher than the top of the bales.

When using metal supports it is best to cover the surface of the supports with heavy rubber, such as old car tires, bicycle tires, or rubber hose cut in half lengthwise. To protect excelsior or straw bales from too much water, the top bale should be capped with a protective covering of plastic or roofing paper.

In the layout for indoor shooting, target matts are placed side by side, touching each other. If space permits (especially outdoors) spacing targets 3 feet apart provides more room for shooters and ease of retrieving arrows.

## Shooting Line

A shooting line can be indicated by marking compound or with a rope or measuring tape stretched between stakes. The stakes should be placed directly in front of each target. For a permanent range, cement or patio blocks, bricks, or similar blocks can be recessed into the ground to indicate shooting positions. The distance from the target face to the shooting position could be painted on the face of the block.

The modified Chicago round is shot from the 20-yard distance. In the modified Flint round, six different distances are needed: 20 feet, 10 yards, 14 yards, 15 yards, 17 yards, and 20 yards. (These

rounds are described on p. 29). When students are shooting at different distances at one time, one common shooting line should be used and the targets should be set at various distances.

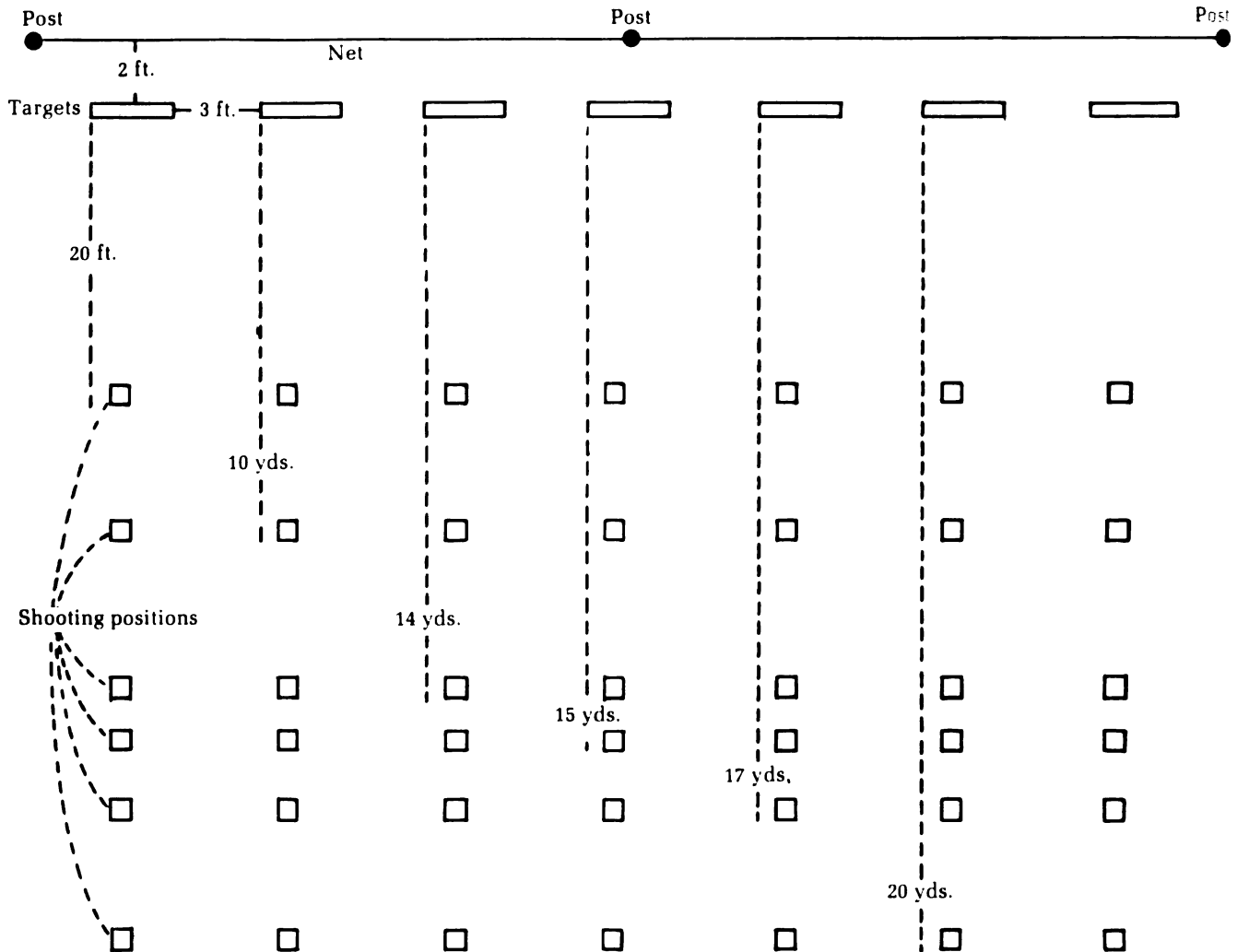


Figure 7. Suggested range layout for outdoor instruction.

### Backstop

If a backstop is used, it should be of a "see-through" type (e.g., a nylon net) to enable the instructor to have complete visibility behind the target line. Posts on which the net is hung should be approximately 25 feet apart. The net should be hung from a heavy wire (No. 8 clothesline) placed 9½ feet from the ground. The recommended net height is 10 feet.

When shooting from beginning distances (20 feet to 20 yards), there should be a minimum of 30 yards clear behind the targets if no backstop is used. A hill is a natural backstop, but care should be taken to prevent anyone from wandering from behind the hill while class is in session.

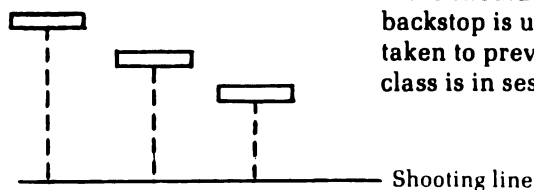


Figure 8. Staggered targets, for shooting at various distances.

# BEGINNING INSTRUCTION

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## equipment

A major factor in good group instruction is sufficient equipment for maximum participation. Ideally, each participant should have a complete outfit of archery equipment, but through good instructional methods a lesser amount of equipment can be effective.

While it may be the practice of the school or agency to provide equipment for instructional activities, archery is somewhat different in that it has more individual equipment which may make it practical in some instances for the students to purchase some items, such as the arm guard, finger tab, and/or arrows. Some variations in providing equipment are:

1. School or agency furnishes adequate equipment for maximum class.
2. School or agency furnishes equipment for half of maximum class.
3. School or agency furnishes bows; students purchase arrows and/or arm guards and finger tabs—or these are furnished on a fee basis.

Note that personal bows should not be used in beginning classes, but may be used in intermediate instruction, and are recommended in advanced shooting. Reason: If the student has his own matched equipment, it's probable that he has shot before. It is much better to have the entire class start on an equal basis with similar equipment.

For the learning experience to be most beneficial, each student should have a 20- to 25-pound bow, an arm guard, a finger tab, a quiver, and six arrows. If it is not possible for each student to have a bow, one bow might be shared by two or more students. Finger tabs and arm guards can be purchased at a nominal cost and much time can be saved if each student has these items.



## SPECIFICATIONS

### Bows

The ideal bow for beginning instruction is relatively short (56 to 64 inches), lightweight (not more than 20 to 25 pounds draw weight), and recurved. The short length is more efficient and the light weight enables the student to learn the basic skills without struggling to draw back the string. *Note that the bow weight is given at 28 inches draw length unless otherwise specified. For each inch under or over 28 inches, the weight decreases or increases approximately 2 pounds.*

Modern recurve bows are either made entirely of fiberglass or are a composite of wood and fiberglass. Fiberglass and composite laminated bows are both satisfactory for beginning instruction; fiberglass bows, however, require less care, are less expensive, and are more serviceable for beginning classes. Intermediate and advanced groups should use laminated bows, which have superior shooting characteristics.

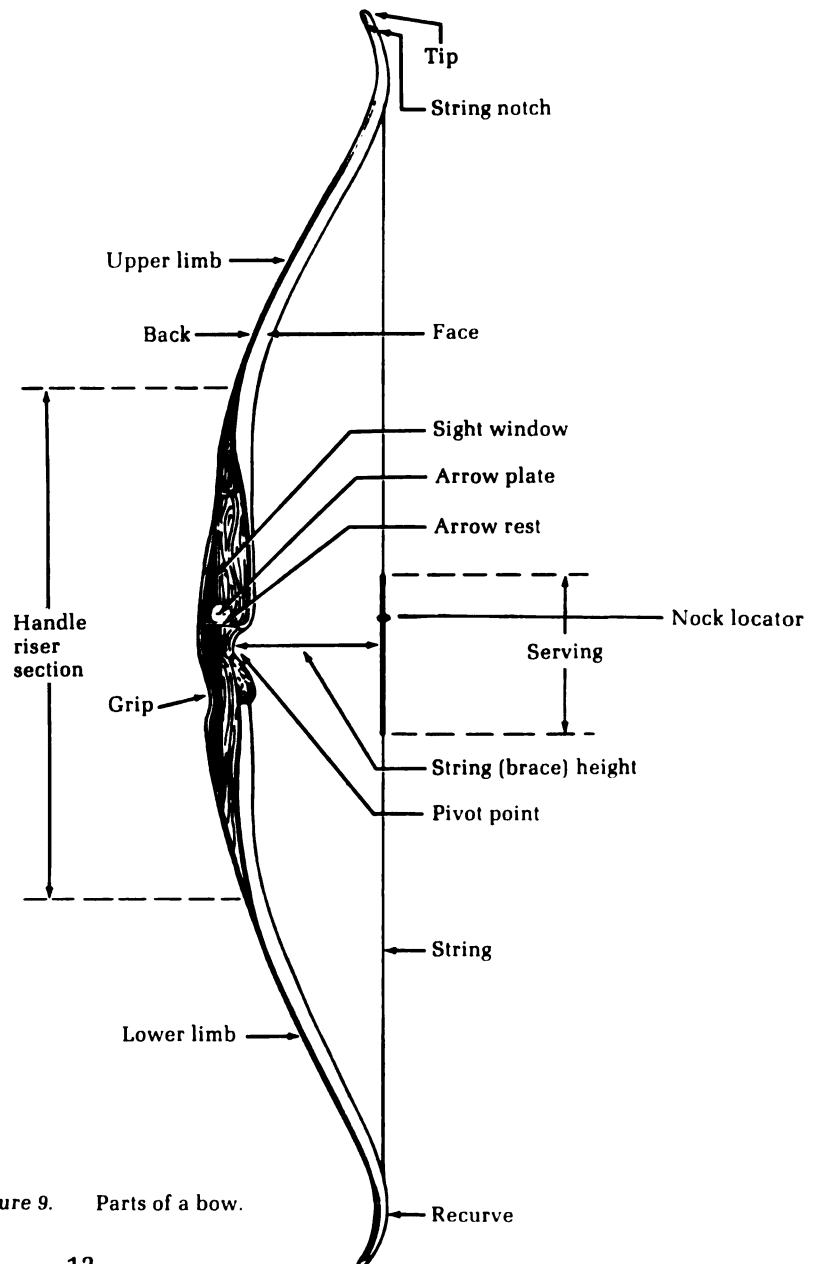


Figure 9. Parts of a bow.

When purchasing bows, be sure to consider that some shooters will be left-handed. If purchasing fiberglass bows, select a type that can be shot from either side; if purchasing laminated bows, about 10 percent should be left-handed.

If not equipped with bow sights, mount a 7-inch piece of plastic or masking tape on the back of each bow from the arrow shelf up. Adhesive tape should never be used because it "cures" with age and will damage the fiberglass. In later instructional periods each student will be furnished with a pin to put in the tape. This pin will be used to learn sight shooting.

## **Bowstrings**

Every bowstring must have a nock locator. Generally, the arrow should be nocked approximately  $\frac{1}{4}$  inch above 90 degrees from the arrow rest to the string. This point can be found by using a folded magazine over the string to the arrow rest (or shelf) or a commercial bow square which automatically indicates the nocking point as well as measures string height. Commercial nock locators are available, or dental floss or plastic tape will usually suffice. The nock locator is positioned on the string just above the point where the arrow is nocked.

The string loop on the upper limb will be a little larger ( $\frac{1}{4}$  inch) than the loop that fits on the lower nock of the bow. When the bow is not strung and for storing, the larger loop fits over the upper limb of the bow; the smaller loop fits into the nock. Commercial tip protectors will hold the string in place, or a rubber band stretched around the string and bow will hold the lower loop in place.

Replacement bowstrips should be ordered according to length and weight of the bow. For example, if a bow is marked 56 inches, 20 pounds, order a 56"-20# string. Do not order by the actual measured length of the string because the manufacturer measures the string under considerable tension. If the bow is not marked, check with the manufacturer.

## **Arrows**

For beginning instruction arrows need not be matched in spine and grain weight. While wood arrows are of lower initial cost, consideration should be given to purchasing fiberglass arrows, which have fewer repair and replacement problems and may, over a period of time, be more economical. When purchasing better grade arrows they should be matched in weight to the bows being used. For example, if 25- and 30-pound bows are used in intermediate or advanced classes, the matched arrows should be marked 25/30# or 30/35#. Wood arrows should be of cedar since the lowest price arrows are often of inferior wood and straightness.

For purposes of planning, the following averages may be helpful:

The average adult male will use a 28-inch arrow.

The average adult female will use a 26-inch arrow.

The average teenager will use a 26-inch arrow.

The average subteen will use a 24-inch arrow.

Two methods of measuring students for proper arrow length are:

1. Place arrow nock in the middle of the chest, extend arms, palms together. Point of arrow should extend a minimum of  $\frac{1}{2}$  inch beyond the fingertips when arms are stretched.
2. Use a training bow (10 pounds or less). Secure an eye hook in the end of a  $\frac{3}{4}$ -inch dowel, 36 inches long. Make a mark on the dowel

24 inches from the hook end and every inch to 30 inches. Slip the bowstring through the eye hook. To measure length, have student draw to the corner of his mouth; the number of inches indicated on the dowel will be the arrow length needed.

**Point of Safety:** It matters little if the arrow extends beyond the bow an inch or two for beginning instruction, but the arrow should never be too short.

A student's arrows should be all of the same length. Each student should have a set of arrows with matching crests. Shooters on one target should have arrows which are crested differently for easy identification. If arrows are not purchased in sets which are already crested, this can be done with a felt pen or spray paint, with students designing their own patterns. (Cresting arrows might be an art class project.) Different color nocks are also a good variation.

To help eliminate the problem of beginning students dropping the arrow when they first learn to draw the bow, it is advisable to either pinch the arrow nocks or build up the serving on the bowstring. In either case, the nocks should be very snug on the bowstring. To pinch the nocks, hold the nock of the arrow in a pan of boiling water for about 10 seconds; then, with the thumb and forefinger, pinch the ends of the nock together until the opening is almost closed. This will allow the student to snap the nock on the string and have the security of knowing that the arrow will not fall off the rest, yet it does not inhibit the flight of the arrow. If pinching the nocks is not desirable, the serving of the string at the point where the arrow nock will be placed can be built up with one or two layers of dental floss.

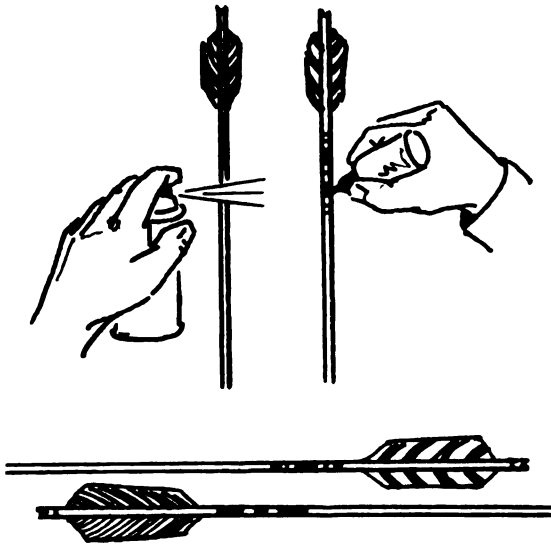


Figure 10. Cresting arrows.

## Quivers

A side quiver of a minimum 16-inch length and preferably a type with a belt clip (because it can be hooked onto a skirt or trousers waistband and does not require a belt) is recommended for group instruction. To prevent losing the clip, tape can be wrapped around the loop attached to the quiver ring. Ground quivers at the shooting line are sometimes used.

## Arm Guards

Arm guards should have at least two straps. Training arm guards, which cover the area from the bicep to the wrist, are also available.

## Finger Protectors

Finger tabs are preferable to gloves for group instruction because they present fewer fitting problems. A glove will take a set. Intermediate and advanced shooters may prefer to use gloves but this is more personalized equipment.

There are two types of tabs: the western style with two finger holes and the Marshall style with a single finger hole. The Marshall style is easier to use in beginning instruction because it is simpler to fit and can be swung around on the back of the hand when not shooting. Approximately 10 percent of the finger tabs should be for left-handed shooters.

**Point of Safety:** Every shooter must use an arm guard and finger protector.

## COST OF EQUIPMENT

The prices listed below are for good quality, medium-priced equipment suitable for beginning classes.

ITEM	SPECIFICATIONS	APPROXIMATE PRICE RANGE
Bows	20# to 25#; 56" to 64"; recurve type	
	Fiberglass Laminated	\$10.00-15.00 25.00-50.00
Arrows	24", 26", 28" (also some 30" if teaching men)	
	Need not be matched in spine and grain weight for beginning instruction	
	Cedar Fiberglass	.50- .75 1.50- 2.50
Quivers	Side quiver with belt clip, 16" or longer	1.50-up
Arm guards	Two-strap	1.00- 3.00
	Training arm guard	3.00- 6.00
Finger protectors	Marshall style tab (single finger hole)	1.00- 1.75
Target matts	36" size	20.00-35.00
Target faces	36" size, 4-color	1.00- 3.50

## STORAGE, CARE, AND SIMPLE REPAIR OF EQUIPMENT

### Bows

Number all bows and other equipment that are used by more than one person for quick and easy identification. For bows, it is best to use a stick-on type label on the face of the lower limb, writing the number on the label with indelible ink and then covering the label with transparent tape. **CAUTION: Do not use adhesive tape on bows. Also, do not use felt marking pens on composite bows because the glass will absorb the ink.** If a permanent marking is desired, the number can be burned into the handle section on the outside (away from the sight window) with a wood burning tool. Numbers should be large enough to be recognizable at a glance. On leather items, such as quivers and arm guards, it is best to use indelible ink.

#### Storage and care.

Laminated bows may be stored in several ways. One of the best ways is to cut a piece of ½-inch Masonite with "V" notches every 2 inches and hang on a wall. These notches should be 1 ¼ inches wide at the base of the triangle. Another method of hanging laminated bows is to nail corks into a wall so that two corks almost touch (about 1/32 inch between them). The upper limb of the bow is then pushed between the two corks and friction will hold the bow. There should be approximately 2 inches between each set of corks. A third method is a series of pegs extending out from the wall 6 to 14 inches, and 18 inches apart. Bows can be laid upon these pegs by the riser section of the bow. Laminated bows should never be suspended on pegs by the limbs. If metal pegs are used they should be covered with surgical tubing to avoid marring or scratching the bow. A simple way to hang bows is by the bowstring on a nail in the wall. This is not recommended, however, as it wears the bowstring and, if the string slips off the bow, the bow falls.

Bows should be stored in an area that is not excessively dry or moist, and where the temperature never exceeds 80 or 90 degrees. At

least once a year, a coat of furniture wax should be applied to each laminated bow, and the string grooves and nocks should be cleaned of accumulated dirt. At this time, the bows should be checked; arrow rests and plates that are excessively worn should be replaced. Replacement parts for bows can be obtained from an archery supplier. If strings on a particular bow are fraying frequently, check the nock of the bow. If there is a sharp edge, carefully round it off with a light nail file.

A bowstringer should be used in stringing all bows, and most particularly, laminated bows. There is little lateral stability in a laminated bow, and continued twisting of a limb will cause the bow to break. If, for any reason, a bow should show a check mark, crack, or the bow breaks, write to the manufacturer, describing as accurately as possible the place and extent of the break, and inquire about steps to be taken. Most manufacturers do not allow dealers to replace bows and, in most cases, a manufacturer will advise the return of the bow for inspection.

### When to replace a bowstring.

Bowstrings will last a very long time with a minimum amount of care. It is advisable to wax bowstrings two or three times a season with a special bowstring wax available from archery suppliers. When a strand breaks or the end loops of a string become frayed, the string should be replaced immediately. It is unwise to try to make a bowstring last a little longer, for if a string should break while the bow is at full draw, there is a chance that the bow will also break. There is an over-serving on the end loops and the center of the bowstring. If this serving comes loose on the end loops, it can be repaired by simply winding it back in place and tying it off with the same system that is used in tying off fishing rod ferrule winds. The center serving may come loose or may wear excessively, while the rest of the string is perfectly good. This may be replaced by using serving thread, which can be purchased through an archery supplier; instructions come with the thread.

### Storage and care.

#### Arrows

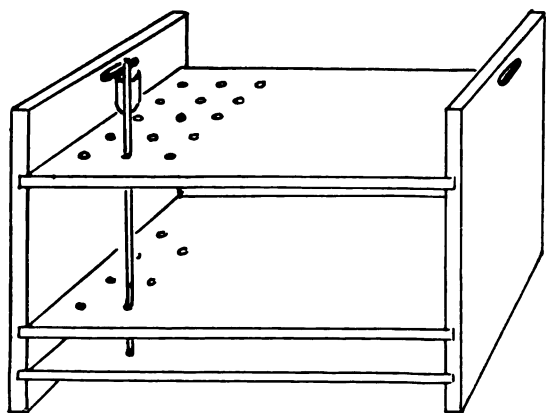


Figure 11. Arrow storage rack.

Arrows with wood shafts can become crooked very easily. If arrows are in constant use, it is probably best to store them in quivers between classes. For inexpensive, lightweight storage of arrows, use a cardboard box with the top glued shut. Turning it upside down, punch holes of a size to hold a set of six arrows (in or out of quivers). With a felt pen, mark the arrow length on the cardboard. A rope attached to each end makes carrying easy. If arrows are to be stored for a length of time a regular arrow rack of Masonite or plywood should be purchased or constructed (Figure 11).

If the feathers of an arrow become matted, hold them over the steam from a teakettle and swirl the shaft in your hand. **CAUTION:** Do not hold the arrow over the steam for more than a few seconds at a time, as excessive moisture will loosen the glue. By twirling the arrow, the feathers will return to their original shape.

If an arrow is excessively crooked, find the point on the shaft where it is out of line to the greatest degree and hold that point over dry heat, such as an electric stove, until it becomes very warm. **CAUTION:** Be careful not to burn the shaft. Then, using the base of the palm of the left hand on that point, bend the arrow in the opposite direction by using the other hand on the nock end of the arrow. Normally, the bend will be in the center of the shaft, but if it is close to the feathers or very close to the point, the arrow cannot be straight-

ened. Keep sighting down the shaft and applying heat and bending until the arrow is straight. Aluminum arrows can be straightened in the same manner, but without heat. With practice it is relatively easy to straighten any arrow, except those with fiberglass shafts.

### **Replacing a nock.**

Replacement nocks can be purchased from an archery supplier. The nocks should match the shafts in size – for example, 5/16-inch nocks should be used on 5/16-inch shafts. However, a 5/16-inch nock also can be fitted to an 11/32-inch shaft, but an 11/32-inch nock will not fit a 5/16-inch shaft.

If part of the old nock remains on the shaft, cut it away with a knife, being careful not to cut the shaft. If it is especially difficult to remove, it can be burned; however, the nock end of the arrow should be up so that the flame will not touch the feathers. Before the plastic is completely burned, the flame should be blown out; the heat should allow the nock to come off completely. Scrape the tapered end of the shaft to remove old glue. Place a drop or two of fast-drying cement in the nock (not on the shaft), and push the nock onto the shaft in a continuous, twisting, clockwise motion. This will spread the glue completely around the taper and inside the nock, and will eliminate any air pockets in the nock. After the nock is on as far as it will go, line up the index (the raised portion of the nock perpendicular to the groove) with cock feather. Remove any excess glue and allow to dry.

### **Replacing a point.**

There are two types of points – the insert and the slipover. Insert points are used only on tubular shafts such as glass or aluminum. Slipover points are used primarily on wood arrows, but may also be used on glass or aluminum.

Often wood arrows are broken on the point end. This does not mean that the arrow is useless; simply cut the shaft to the next shorter length and put on a new point. As with nocks, the point must be the proper size. Point sizes are the same as shafts, so for 5/16-inch shafts purchase 5/16-inch points, etc. It is helpful to have a taper tool which can be used to taper the shaft for both nock and point and to tenon a shaft for a slipover target point. The adhesive recommended for attaching points is ferrule cement in either liquid or stick form.

Using liquid cement, coat the point end of the shaft with the cement, light it with a match, and, as the flame starts to die down, push the point onto the shaft. Using the stick form, break a little chunk of the cement off the stick and put it into the point. Hold the point with a pair of pliers over an open flame until the cement melts. When it is melted, push the shaft and point together and allow to cool. In either case, after the point has cooled, use a nail and hammer to indent the four sides of the point. Hold the nail on the ferrule of the point and strike a sharp blow with the hammer. A crimping tool can also be used to keep the point in place. Insert points are handled in the same manner, except that liquid cement is preferable because it must be put on the insert part of the point rather than on the shaft. Most manufacturers include instructions with their arrows on how to replace points.

### **Replacing a feather.**

A fletching tool is recommended; it should include instructions for replacing a feather. However, individual feathers can be replaced on wood arrows by purchasing die-cut feathers from an archery supplier.

The die-cut feather should have the same trim and shape as the other feathers on the arrow. Prepare the shaft by scraping with a knife the place where the new feather is to be applied so there is no rough spot. Pick up the die-cut feather, being careful not to put your fingers on the quill, as they will leave oil on the quill and the glue will not adhere correctly. Place a straight pin on the trail (back) end of the feather and put this closest to the nock, pushing the pin into the wood shaft. Apply glue to the quill. Then lay the whole quill in place in the same direction as the other feathers on the arrow and put another straight pin on the lead edge of the feather. After the feather is secured in the proper direction, put two more straight pins through the quill on either side of the feather to hold the quill in place while the glue is drying. Additional glue may be needed along the edges of the quill. There should be no bend in the quill to allow an air space between the quill and the shaft. After the glue is dry, remove the pins and apply an additional drop of glue to the very lead edge of the feather. Allow it to dry slightly, then press on it with the thumb so there will be no sharp edge on the feather. A fast-drying glue, such as airplane cement, should be used in replacing feathers.

In nearly every community there is an archery club or at least an archery enthusiast. It is a good idea to check with the archery supplier to try to arrange for repair of arrows. If this is not possible, it is suggested that the local archery club be contacted to find an individual who would be interested in refletching and rejuvenating arrows. This is advantageous—both in economy and in the additional help a knowledgeable person can give in other phases of the sport.

#### **When to discard an arrow.**

Any arrow developing splinters or a crack should be broken immediately and thrown away. One of the hazards in archery is that of an arrow “exploding.” This only happens when an arrow is used that should have been discarded. It is advisable to have students check their arrows for cracks and gouges prior to shooting in each class period. If there is ever any doubt, do not shoot the arrow.

**CAUTION:** *Never try to repair a cracked arrow.* The best way to determine if an arrow is cracked is to hold the arrow nock between thumb and forefinger with the point toward the ground. With the other hand, snap the middle of the shaft with the finger and listen for a vibration. If the arrow is sound, there will be a dull thud; if the arrow is cracked, there will be a slight “tinny” vibration sound. Points can be salvaged from cracked and broken arrows, but it is impractical to try to salvage the nock or feathers. An arrow that is splintered only at the point might be cut down to the next shorter length and a new point put on the shaft.

### **Off-Season Storage of Bows and Arrows**

Arrows should be stored in regular arrow racks so that they are held straight. Both bows and arrows should be stored in an area where there will not be excessive humidity and the temperatures will not exceed 85 or 90 degrees. Heat is the worst enemy of laminated bows, with humidity running a close second. Heat and humidity can ruin arrows. When storing bows do not stack too many in one pile, as the weight could damage the bottom bows. Arrows should be covered. A few mothballs stored with them will prevent crickets and other insects from eating the feathers. Leather accessories should be kept in a dry place safe from rodents. Laminated bows should never be suspended by the limbs nor should there be any weight on the limbs.

# instruction

The basic philosophy underlying this method of instruction is to give the student an activity with lifelong participation values and to teach him to have fun shooting a bow and arrow. To achieve this goal, the instruction is based on immediate participation and immediate success. For example, targets are placed on the ground rather than at the traditional 48-inch level because fewer arrows miss the target when it is on the ground. Thus, more class time can be spent on shooting and less time on looking for arrows. Beginning students tend to shoot high because they want to look at the point of their arrow; having targets on the ground, and starting at a short distance (20 feet) tend to cause students to lower their bow arm, thereby hitting the target with their first group of arrows. This combination of targets on the ground and a short distance, plus the use of a lightweight bow and the instruction procedure presented in this manual help students achieve immediate participation (shooting in the first class period) and immediate success (hitting the target with the first group of arrows).

This manual and the method presented are based on the premise that these are beginning classes and the goal is to provide opportunities for all to learn basic archery skills. It is not expected that the individual will stop with this basic instruction. As in other sports comparable to archery, at least some of the participants will wish to improve their skills and enter the competitive field, engage in bow-hunting, and participate in other archery activities.

Effective group instruction implies that each member of the class must participate in the learning activity as though he were the only member being taught. The best that is known about learning can be applied effectively to the teaching of archery and/or its component skills and techniques.

Learning is change of behavior, and is based on two factors: how the learner perceives himself, and how he perceives the situation he is in. Among the crucial perceptions of an individual who is learning archery are those related to the teacher's demonstrations and verbal instructions, the attitudes and skill levels of other learners in the group, kinesthetic perceptions from his own body and the relationship of the bow and arrow to it, the student's proximity to the target, audiovisual aids utilized, and past experiences in learning skills, successful or not.

The teacher provides a learning environment rich in resources and facilitates learning for the individual by helping him perceive more accurately the various movements or movement patterns involved in archery.

Very important is the teacher's attitude toward the learner. If the individual perceives that the teacher has little or no confidence in his ability to learn archery, it is doubtful that he will make much progress. No matter how excellent the instructional techniques, if the student is not helped to see that archery has meaning for him, the instruction will not be completely effective.

The suggested instructional procedure in the following section is a positive approach with a sequential arrangement of teaching content and methods. There is unlimited opportunity for the creative



teacher to utilize new and effective methods and instructional resources.

## CLASS ORGANIZATION



Figure 12. Method of determining eye dominance.

Prior to issuing equipment, check each student for eye dominance. This can be done in several ways. One of the simplest ways to determine this in a group is to have the students face an object, such as the target, their arms extended with open palms toward the target. Their two hands and thumbs should overlap so that there is a small opening between the two hands. With both eyes open have the students center the bullseye in the opening made by their hands. Then have them close their left eye. If the object remains in the opening those students should shoot right-handed; have them drop their hands. The remaining students should again center the object in the opening with both eyes open and close their left eye. Those who do not see the object in the opening with the left eye closed should shoot left-handed.

Visual dominance is unrelated to visual acuity. The reason for this test is that the dominant eye will automatically align any lineal object projected in front of it. Therefore, if the left eye is dominant and the student shoots right-handed, he will tend to shoot consistently to the left. Occasionally there will be a student with "non-dominance"; he can shoot from either side, whichever seems natural.

Call the students' attention to suitable attire for shooting and suggest that, if possible, they wear a knit shirt or fairly close fitting shirt or blouse, preferably with short sleeves. Caution the class to remove objects such as pins, pencils, loose sweaters, and watches from the shooting side (left side for right-handed shooters). This is an important safety factor and you should check this on the shooting line at every session.

Before issuing equipment at the first session, caution the class merely to hold the items issued and not try to put on the leather or shoot an arrow until instructed to do so.

Bows should be already strung when issued to a class at the first session or sessions. (Stringing and unstringing the bow will be taught later.) It is desirable that bows be strung with a commercial bow-stringer which can be purchased at moderate cost.

Student assistants can check equipment out and in. After students are checked for arrow length, equipment can be issued from an equipment room or from mobile equipment racks brought to the shooting area. For example, a blackboard on a movable stand could be adapted for a bow rack; movable arrow racks can be used; and leather accessories can be laid out on a table.

All tackle should be numbered. Corresponding numbers on storage racks facilitates checking out tackle and returning it. A student should use the same tackle in each class period. It is helpful to make up a chart with each student's name showing the identification number of the tackle issued to each student and target assignment. It is psychologically desirable if target assignments are rotated from time to time. Students should be responsible for returning equipment to the proper place at the end of the session. If it is within the school policy, students should be allowed to check out tackle for weekend use, particularly at the college level.

Consistent class procedure saves time and avoids confusion. Consistency in checking tackle in and out, for example, will result in a minimum amount of time in handling equipment, allowing more time for instruction and shooting.

For beginning instruction it is suggested that left-handed shooters be grouped at the right end of the shooting line to allow them a better view of the instructor as he demonstrates (see Figure 3, p. 8).

Instruction takes place at the shooting line. Regardless of the size of the class it is recommended that a partner system and Lines A and B be used. If equipment or space is very limited, a third line, Line C, can be used. If equipment is shared, particularly arrows, be sure students are matched with partners who require the same length arrows.

Explain the use of the whistle before beginning instruction: One whistle means begin shooting or retrieve arrows. The whistle to retrieve arrows will be blown when all shooters have completed shooting and have stepped back from the shooting line. Two or more whistles mean danger or emergency situation – all shooters stop where they are, return arrows to quivers, and step back from the shooting line.

## INSTRUCTIONAL AIDS

### Steps in Shooting an Arrow

STATIC	DYNAMIC
1. Stance	7. Draw-anchor
2. Nock arrow	8. Aim – hold
3. Set hook	9. Aim – release
4. Establish bow hand and arm	10. Aim – follow-through
5. Head up	
6. Raise unit	

In this method of instruction there will be 10 steps in the shooting of each arrow. Probably the most important instructional aid is to have these steps printed on cardboard or other poster material (approximately 22 by 30 inches, with letters at least 2 inches high, to be readable at a distance of 20 yards). The words are "trigger phrases" to initiate an action. You will note that the shooting of an arrow is divided into two parts – static and dynamic. In the static part there are no muscles under great tension; in the dynamic part the proper muscles are under tension.

The sign should be placed at the right end of the target line so that it is readable by the entire class at the shooting line. It may be helpful to have additional signs so that they can be placed at each end of the target line. Since a major cause of poor shooting is a deficiency in basic form, signs should be displayed any time there is shooting – whether it be beginning, intermediate or advanced.

Archery is a game of consistency, which is achieved through repetition. The 10-step poster not only reminds students of the sequence in the repetition but also serves as a helpful checklist for you. The order of the steps in the instruction does not follow the sign. There is a definite safety reason for this: the students should not be allowed to nock an arrow until they are actually ready to shoot.

You may also wish to create your own flip charts to emphasize each step. Other useful visual aids include slides, movies, student demonstrations, and videotape with instant replay.

## INSTRUCTION PROCEDURE

This instruction is divided into six units. They are not necessarily designed to fit any given class period. It is up to the individual instructor to plan the time allotment. NOTE: *Directions will be given for right-handed shooters; left-handers should do the opposite.*

### unit 1

The object of this first unit is immediate participation and immediate success. There should be no insistence on perfect form at this time.

Have all students line up at the shooting line (20 feet) and count off by fours. Assign the first group of four to shoot at target 1, the next four at target 2, etc. Ones and threes are Line A and remain at the shooting line; twos and fours are Line B and should step back about four steps. Both Lines A and B follow these instructions.

### Place Quiver

Demonstrate the proper placement of the quiver by hooking the quiver at the right hip with arrow nocks forward (left-handed shooters should place the quiver on their left hip).

### Position Tab

Explain and demonstrate the proper placement of the tab. Using the Marshall style tab, smooth side up, put the middle finger of the right hand down through the hole.

## Position Arm Guard

With narrow end toward the left wrist, tell the class to center the arm guard on the inside of the arm between the wrist and elbow and fasten the straps.

## Establish Stance

Have the students stand at a right angle to and with their left shoulder toward the target (left-handers should stand with their right shoulder toward the target). Weight should be evenly distributed and feet should be as wide apart as is comfortable (approximately shoulder width). This is the square stance. Instruct students to move their right foot forward, toward the person in front of them, until the instep of their right foot lines up with the toe of their left foot. Tell students to raise up on their toes and take a  $\frac{1}{8}$  turn toward the target. This is the oblique stance.

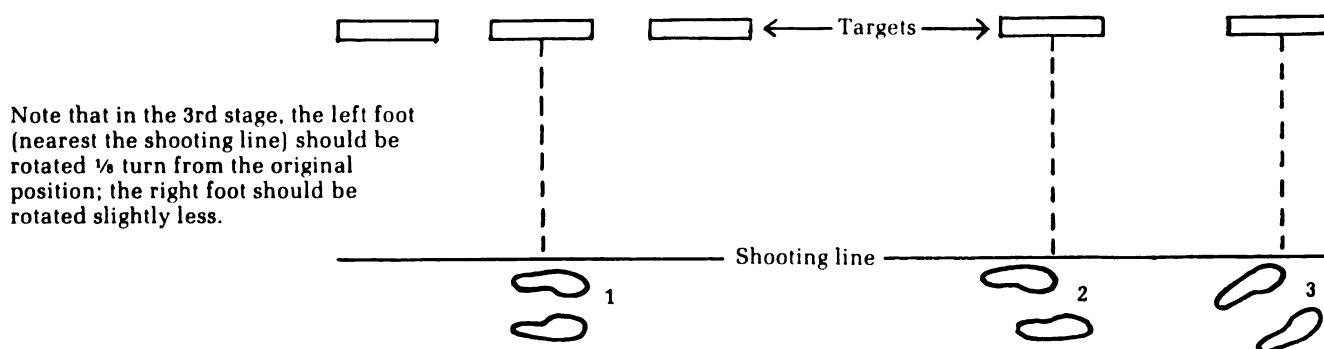


Figure 13. Establishing the stance.

Square stance

Oblique stance

The oblique stance is used because (1) it allows beginners to use the back muscles immediately; (2) it moves the string away from the bow arm so there is less chance of string slap; and (3) it gives the student a secure base.

## Establish Bow Hold

Have each student extend his left arm toward the target with the left hand in a "handshake" position. Direct each student to grasp the lower limb of the bow with the right hand; place the pivot point of the bow handle (Figure 9, p. 12) in the "V" formed by the thumb and forefinger of the left hand; and drop the forefinger around the back of the bow with the thumb resting lightly over the forefinger. The other three fingers should be pointing toward the target.

Inform students that the pivot point should touch only the meaty part of the thumb and that no other part of the hand or palm should touch the bow. The extreme of extending the last three fingers toward the target will help the student keep the palm off the bow. This should result in a relaxed hold on the bow and avoid a "gripping" on the bow handle. The wrist should be straight, but relaxed. Have the student relax and hold the bow at his side with the string up so that the bow does not interfere with students on either side. Tell each student to raise his head, look at the bullseye, raise the bow arm to shoulder height, and lower again to the side.

## Set a Hook

Without the tab in shooting position, demonstrate and have the class do a "Boy Scout salute" (with the thumb and little finger of the right

hand touching over the palm and with the other three fingers straight). Now have students set a hook by pointing the tips of the three string fingers toward the thumb. The students should hook the first three fingers onto the string at the nocking point so that the string lies in the crease made by the first joint of each finger.

The back of the hand should be kept straight—a cupped hand is incorrect. When the students draw, you will note that the pressure of the string will force the fingers to straighten slightly and this is correct. The Boy Scout salute is used to keep the thumb off the arrow, but as the students shoot for a while, the thumb and little finger will relax.

**Practice Release** With the completed unit (bow hold, arm straight down at side, and fingers on the string), have the class raise head to look at the bullseye, raise both arms to shoulder level, and stop. Instruct class to draw the bowstring 1 inch, relax the fingers, and let the string roll off the fingers. If you tell the class “1 inch,” almost all will draw 3 to 5 inches; if you say “5 inches,” they will draw 15 inches.

Have students repeat this drawing and releasing of the string at least three more times or until most of the students have the feel of the release. This can be done while the bow arm remains in position so it is unnecessary to go through the whole routine of forming the unit each time.

**Establish an Anchor** With the draw hand in correct position (but not on the string—Boy Scout salute in hook position), demonstrate and have the students hook the “V” made by the thumb and forefinger behind the jawbone. Students should lay the forefinger along the face so that the tip of the forefinger touches the corner of their mouth, with all three string fingers still in proper hook position. Another method: Tell students to look at the person in front of them; then, have them place the hook on their mouth and turn their head to look at the target. (This may help them locate the anchor position.) This is the high anchor.

Explain to the class that archery is a game of consistency and that the anchor point is one of the most important parts of consistency in shooting. An exact anchor establishes the velocity of the arrow, as the length of the drawn arrow will determine the number of pounds of the bow that are utilized. Consequently, if the bow were drawn 1 inch longer one time than another, it would impart approximately 2 pounds more energy to the arrow. Raising or lowering an anchor point will have the same effect on trajectory as raising or lowering the rear sight of a rifle.

**Practice Draw** Prior to giving this instruction, tell the students that they should never let go of the bowstring at full draw without an arrow because the bow might break.

Have students assume the stance and establish bow hold, with the hook and fingers on the string (again not using the tab). Then instruct the students to straighten bow arm, raise their head, look at the target, draw to anchor, and *let down*. Line B may be used to check Line A, and vice versa.

**CAUTION:** *Never allow an arrow on the bow during this exercise.*

Repeat this several times. As the lines repeat the exercise, check the path each student's string is going to travel to be sure that there is string clearance to avoid string slap on the arm. With female stu-

dents be sure the string is on the outside of the breast. Some students will have a hyperextended elbow or for some other reason it appears that the string will hit the arm. This will be a minority of the students and they should be worked with individually. There are two common ways to eliminate this problem:

- a. Tell the student to extend the bow arm at shoulder level toward the target; bend the bow arm at the elbow; bring the handle of the bow in to the chest; and re-extend the arm.
- b. If this does not position the bow properly, have the student extend the bow arm toward the target at shoulder level and from the shoulder roll the whole arm, including the elbow and wrist, until the bow is horizontal to the ground. Then have the student straighten the bow with just a turn of his wrist without moving the rest of his arm.

### **Nock Arrow**

*Line A only:* With the bow hand in place and with the string against the hip, have the students take an arrow from the quiver, holding the arrow at the crest between the thumb and index finger. Instruct them to push the nock of the arrow onto the string just below the nock locator. The cock feather (odd-colored feather) should be away from the bow, and the shaft of the arrow should be lying on the arrow rest. Be sure that no student holds the arrow with the index finger of the bow hand. Pinching the nocks makes this unnecessary (p. 14).

### **Release Arrow**

Using the finger tab and with the arrow now in place, have the students re-establish the stance and set the hook on the string, with index finger above the nock of the arrow and the next two fingers below the nock. They should re-establish the bow hold, making sure the bow arm is straight at the side. Talk the students as a group through each of the 10 steps (p. 21). Have the students raise their head, look at the bullseye, raise the unit, stop (with elbow of the draw arm slightly above the plane of the arrow), draw to anchor, and release—thereby shooting an arrow.

Prior to the completion of this first shot, a very short explanation of instinctive aiming should be given but not dwelt upon. It is sometimes helpful to use an analogy, such as: shooting a bow instinctively is similar to throwing a baseball; concentrate and focus eyes upon the point you want to hit. Do not look at the arrow or bow, but keep both eyes open.

After shooting the first arrow, use the 10 basic steps and talk Line A through a second arrow. Have Lines A and B exchange places. Talk Line B through four arrows. Have Lines B and A exchange places again and talk Line A through their remaining two arrows.

Repetition is extremely important in teaching a person to shoot a bow. Talking the class through these first shots serves as a safety control and gives the students repetitious verbal direction.

If this procedure is followed, all students should have shot a minimum of four arrows in the first 30 minutes.

In these first few arrows the instructor should be concerned only that the student does not hit his arm and is able to hit the target. Perfect form is immaterial at this stage. Emphasis should be on immediate participation and immediate success.

### **Retrieve Arrows**

After all students have shot four arrows (six, if time permits), demonstrate and explain the proper methods of retrieving arrows from the target and ground. Explain the duties of the foursome in retrieving

arrows. Have each group assign: a *target captain* whose duty is to withdraw all arrows from the target; two *arrow receivers* whose duties are to record scores and receive the arrows as the captain withdraws them from the target; and an *arrow retriever* who retrieves arrows that missed the target.

It is each individual's responsibility to pick up all arrows he sees lying on the ground and give them to the arrow retriever. Caution the students to walk *slowly* to the target and watch for arrows on the ground. Demonstrate that an arrow buried under the grass should be withdrawn point first and be completely clear of the grass before the arrow is lifted.

Explain and demonstrate withdrawing arrows from the target. Have students place their left hand flat upon the target face with the arrow shaft close to but not touching the base of the "V" made by the thumb and forefinger. During this operation the person withdrawing the arrows should stand to the left of the arrow and lean slightly over the top of it. He should then grasp the arrow shaft with the right hand at a point closest to the left hand and the target, and pull the arrow straight out of the target, being careful not to bend the arrow shaft up or down, right or left.

**Point of Safety:** Stress that no one stand directly in front of the target while arrows are being withdrawn.

The arrow receivers should not attempt to separate the arrows at the target. After all scores have been recorded and arrows are withdrawn, the receivers take the arrows to the shooting line before separating them and giving them back to the shooters.

**Point of Safety:** The target captain is responsible for each member of the group. It is his job to remain in front of the target until all members of his group have started back to the shooting line.

If the target groups are fewer or more than four people, adjust the target assignments accordingly. After assignments have been made and the withdrawing of arrows has been demonstrated, have the students retrieve their arrows and return to the shooting line.

For the remainder of this unit the students should shoot as much as possible with a minimum amount of instruction. However, the instructor should talk the lines through at least the first arrow of each end.

## unit 2

Have students shoot one end at 20 feet; talk them through the 10 steps for at least half the arrows.

### Follow Through

Tell the students to continue to aim, with eyes focused on the bullseye, and bow arm and drawing hand still in shooting position for a count of two after the release. A good trigger phrase is "hold a pose," as for a picture. An analogy of the follow-through could be that of shooting a rifle. If, upon squeezing the trigger, the barrel is moved, the bullet will be thrown off-target in that direction. The same thing happens with movement in the bow arm upon release: if the bow arm is dropped, the arrow drops.

It is natural for the bow arm on a right-handed shooter to move slightly left and down on the release because of the sudden release of tension.

Have the students shoot an end concentrating on follow-through. It is recommended at this point to continue to talk the lines through at least one arrow of each end.

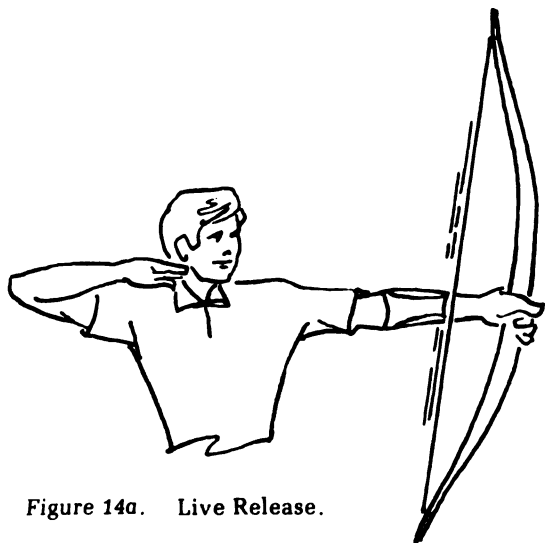


Figure 14a. Live Release.

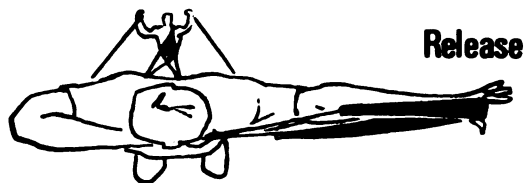
Inform the class that while Line A is shooting, the corresponding target members on Line B will act as student coaches; similarly, when Line B is shooting, Line A will act as coaches. If there is room, each student coach should stand on the shooting line facing his corresponding shooter. If there is not room on the shooting line, each coach should stand behind and slightly to the side where he can watch the shooter's anchor, release, and bow arm. This system enables the instructor to have better control of the class and keeps all students occupied. It also gives the student coaches a better perception of their own shooting.

The student coach's job is to remind the shooter to concentrate on the 10 basic steps. The coaches should be cautioned to offer suggestions to the shooter only between arrows, not while the shooter is at full draw. They should also be cautioned never to reach through the string. The student coach/shooter relationship affords an optimal learning opportunity.

The remainder of this unit should be spent in practice to acquaint students with the student coach situation, with emphasis on each of the 10 steps, including follow-through.

### unit 3

Begin the class by shooting one end at 20 feet.



Release

Figure 14b. Action of the live release (idea of "strong man" pulling on back muscles).

Explain and demonstrate the live release. A live release is a normal reaction of the drawing hand moving back, with the string rolling off the fingers as they are relaxed. This hand reaction is caused by the back muscles and not by pulling the fingers off the string. Emphasize that the release remains an action of relaxing the fingers and letting the string roll off, and that the natural reaction of the back muscles pulling together will cause a slight backward movement of the drawing hand and a slight downward and outward movement of the bow hand.

An excellent way to demonstrate the action of a live release is to place the drawing hand in anchor position, invert the bow hand, and hook the three fingers of the bow hand in the three fingers of the drawing hand. Holding the drawing hand in anchor position, start pulling the hands in opposite directions and transfer the pull to the back muscles.

Have the students shoot one end, concentrating on live release. Utilize student coaches. Spend as much of the remaining time as possible shooting while concentrating on and repeating the basic 10 steps. Reserve enough time to teach the students how to unstring and string a bow.

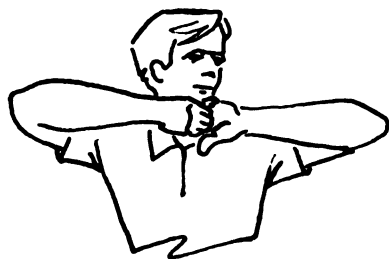


Figure 15. Exercise to demonstrate live release.

### String and Unstring a Bow (Step-Through Method)

This method is the only safe method to use without the aid of a mechanical bowstringer. (*It is strongly recommended that commercial bowstringers be considered in the program.*) Caution students that improper use of the step-through method will twist the limbs of the bow and could cause the bow to break.

1. Have students check to make sure that the bottom loop of the bowstring is properly seated in the string groove on the lower limb. A rubberband stretched around the string and bow will hold the lower loop in place.
2. While the students are holding the bow by the upper limb in their right hand, tell them to look at the position of their right foot; step across the bow with the right leg; and return the right foot to the same position.



Figure 16. Stringing the bow.

3. Instruct them to lay the curve of the lower limb over their left ankle. With the lower loop in place, have them hold the string taut in their left hand.
4. Then have the students place the handle of the bow under their right thigh, keeping the right knee slightly bent.
5. The students should place their right hand beneath the curve of the top limb—palm open. The bow should rest across the palm and base of the thumb, the elbow held high.
6. Have the students keep their left leg straight; raise their left heel off the ground and outward; and push forward with the right hand while locking the right knee so that the bow bends naturally.
7. The students should then slip the top loop of the string into place and relax—slowly.
8. Have the students check to see that the string is seated properly in the nock before releasing the tension on the bow.

To unstring the bow, just have the students reverse this process. It is a good idea to string and unstring the bow several times until it becomes easy and natural to do. From this point on, stringing and unstringing will be done by the students at each session.

## unit 4

Have the students shoot one end at 20 feet; talk them through at least one arrow. After the first end, move the class to 15 yards.

### Aim — Pre-Gap (or Pre-Draw-Gap) Method

This is a method of teaching the student to shoot without a bow sight, and is an aid for teaching instinctive shooting. The principle behind it is that it sets the shooter's arm on a plane with the target and in proper position so that at full draw his concentration can be entirely on the spot he wants to hit. It is important after the pre-gap spot is established and the unit is set that nothing moves except the draw to anchor. The bow arm must remain as steady as possible. The pre-gap spot does not have to be exact because the shooter's instinctive ability will take over as he holds at full draw and concentrates on the target. He will instinctively make the minor adjustments necessary. The pre-gap method is not an end in itself, but the basic mechanics of the method give the students security in learning instinctive shooting.

Talk the students through the first six basic steps in shooting, raising the unit. (1) Then have them look across the point of the arrow to a predetermined spot. If students stand 15 yards from a 36-inch target with a 20- or 25-pound bow, a spot at the base of the bale will usually enable them at least to hit the target. It is important that they get the sensation of "being on the spot." Have the students maintain bow arm position and body position. (2) Tell them to shift their eyes to the center of the bullseye and concentrate on the center, holding as steady as possible. (3) Next have the students continue through the dynamic steps of shooting—draw to anchor, hold, release, and follow through—maintaining body position and bow arm position until after the arrow has hit the target.

Help the students to adjust the predetermined spot by having them note where the first arrow entered the target. If a student's arrow was high, tell him to lower the spot; if his arrow was low, tell him to raise the spot.

Continue to talk students through this method, arrow by arrow, for at least two ends. Remind them to shift their eyes to the bullseye prior to the draw. On the third end explain to the students that they can see the point of the arrow in their peripheral vision while keeping their eyes on the center of the target. Have them set their pre-gap



spot without looking directly at the arrow, using only peripheral vision. Continue to practice this procedure.

**unit 5** Begin the class by shooting one end at 15 yards using the pre-gap method. Remind students that regardless of the distance or the method of aiming, the basic form does not change. After the students have shot the end, have them go to the 20-foot line. Each bow should be equipped with a bow sight or a large-headed pin to be placed under the tape on the back of the bow.

### Aim — Sight Method



Figure 17. Use of pin-type bow sight.

Prior to class, sight-in one bow with a 26-inch arrow and note the placement of the pin. This placement should be translated into inches from the arrow shelf.

Explain the placement and use of a sight. Have students place the pin in the tape at the predetermined distance from the arrow shelf, with the head of the pin projecting approximately 1 inch from the same side of the bow as the arrow.

Proceed with the usual basic steps. After raising the unit have the students close the left eye, and using the right eye, center the pin on the center of the bullseye. Draw to anchor. Hold the pin as steady as possible on the center, and then release and follow through.

Let Lines A and B each shoot one end in this manner as long as the arrows hit somewhere on the target. Before retrieving arrows explain sight adjustment. Have the students reset their pins according to their group of arrows. A simple way to demonstrate movement of the sight is to adjust the sight in the same direction as the error. If the group is high, move the sight up; if the group is left, move the sight to the left, and so on.

Have students retrieve their arrows and shoot a second end with the new sight setting. Once a sight is positioned for success at a given distance it should be marked for each individual shooter.

Have students retrieve their arrows and go immediately to the 15-yard shooting line.

### Draw Low Anchor

Explain the low anchor. Follow the basic steps of shooting through Step 6. Take the students through the first six basic steps of shooting. Then with the drawing hand and arm at shoulder level, and with both eyes on the center of the bullseye, instruct students to raise the head slightly until the skin of the neck is tight. Have them draw the bowstring toward the throat directly underneath the left eye until the thumbnail of the drawing hand lies lightly on the Adam's apple. They should then turn the head to the left, and place and center the chin on the string. Instruct the students to lower the head until the chin rests on the drawing hand, and place and center the nose on the string. Have the students relax the slightly cupped little finger of the drawing hand and allow it to drop down and lightly touch the neckline clothing. They should continue to maintain tension in the drawing elbow and proceed with Steps 8, 9, and 10 of the basic steps of shooting an arrow.

Have students practice this draw and anchor several times before shooting an arrow. As the students practice this anchor, check the draw arm elbow position. Many students will let this elbow drop down, making the draw to anchor and holding difficult. Correct this as recommended in "Teaching Tips" (no. 26, p. 31).

Have the students shoot an arrow with an under-the-chin anchor from 15 yards using the same sight setting as with a high anchor at 20 feet. If a student hits the target on the first arrow he should retain the

same sight setting and shoot the remainder of his arrows. When he has finished shooting his arrows, he should then readjust the sight setting as above.

The remainder of this unit should be spent on practicing sight shooting with the low anchor. At the end of this unit reserve enough time for a short discussion period. Inform the students that they have been exposed to two different types of anchor—low and high (p. 23); and two different methods of aiming—instinctive and sight; and that from this point on they should choose the methods of anchor and aiming that they prefer, stick with them, and develop their form.

## **unit 6**

### **Shoot a Competitive Round**

Listed below are two rounds that are adaptable to instructional use. In conducting a competitive round or tournament, two practice ends should be allowed before the scoring begins. The purpose of these rounds is to expose students to the mechanics of a tournament. The scores might be used as a part of the skill evaluation.

#### **Instructional Round I**

Distance: 20 yards

Target: 36-inch, 4-color face

Total arrows: 60 (5 arrows per end; 4 ends per game; 3 games per round)

Score: 5-4-3-2-1

Total points: 300

#### **Instructional Round II (American Archery Council Instructional Round)**

##### **(1) Modified Chicago Round**

Distance: 20 yards

Target: 36-inch, 4-color face

Total arrows: 30 (5 arrows per end; 6 ends per game; 1 game per round)

Score: 5-4-3-2-1

Total points: 150

##### **(2) Modified Flint Round**

Total arrows: 30

Score: 5-3

Total points: 150

Station 1 4 arrows at 17 yards - 18-inch B&W face

Station 2 4 arrows at 20 feet - 12-inch B&W face

Station 3 4 arrows at 20 yards - 18-inch face

Station 4 4 arrows at 14 yards - 12-inch face

Station 5 4 arrows at 15 yards - 18-inch face

Station 6 4 arrows at 10 yards - 12-inch face

Station 7 1 arrow each at 20  
yards, 17 yards, 15  
yards, 14 yards, 10  
yards, 20 feet - 18-inch face

Total points for Round II: 300

## TEACHING TIPS

1. Put the bow in the student's hand as soon as possible so he can understand the tool while basics are explained.
2. Be sure to check for pins, loose sleeves, etc., on the bow side of the student before allowing him to shoot.
3. Check the student's finger tab closely before he shoots. There may be a tendency not to put it on all the way.
4. Watch for four fingers on the string. Often a student will use the little finger on the draw hand, and it is difficult to spot.
5. Look for cramped fingers on the bowstring. Students frequently point the fingers down rather than horizontally, which causes the arrow to stay on the string but not on the bow.
6. Watch the thumb on the drawing hand. Students tend to push the nock as they place the fingers on the string. Correct this early and often until the fault is eliminated.
7. If a student masters the draw and anchor quite readily, stand behind him and check the string path before allowing him to shoot. Never allow a student to hit his arm.
8. Let students shoot the first arrow as soon as possible, even if the bow hand, anchor, draw, etc., are not good. Work on these aspects after they have shot a few arrows.
9. The tone of the instructor's voice will convey many things, both good and bad. Try to keep an enthusiastic approach in your voice and actions.
10. Use a positive approach in all instructions. Minimize the use of the word "don't." Use praise sincerely whenever possible.
11. Usually it's best to avoid emphasizing what a student is doing wrong. Suggest a correct way to him.
12. The first time a student hits the target, he is very proud of his accomplishment; be sure to praise him.
13. Before making a correction, analyze the student's fault to find the cause. Often the cause is hidden by the obvious effect of the error. A good example is bow arm movement. Many times this is caused by a forward release, but to the self-styled shooter the error is simply a moved bow arm.
14. Never correct a student after spotting a fault on one arrow shot. Watch him shoot several arrows so that the cause of the fault may be determined and then correct him.
15. Don't over-instruct. The more you talk and bring up various problems, the more confused the student will become.
16. Stick to the 10 basic steps in shooting and repeat them constantly. Repetition will make the student comfortable.
17. It is permissible and correct to draw a bow without an arrow to demonstrate a shooting technique to the class. However, when this is first done, caution the students about the danger of drawing a bow when someone is standing in front of them and the possible result of an accidental firing of a dry bow.
18. Demonstrations of the component skills are useful in instruction; however, don't demonstrate your personal shooting ability, especially in the beginning stages of a class.
19. When demonstrating techniques to the class, be sure to perform them correctly. People tend to imitate, and anything the instructor does in class automatically becomes an accepted method by the students.

20. Use problems as they develop to your instructional advantage. For example, if an arrow hits the target but hangs down, stop the whole class and explain the rule.
21. A common fault with beginning students is the falling of arrows from the arrow shelf. The slipping is caused by the fingers rolling the string away from the bow. By taking a slightly deeper hook on the string and securing the string in the crease of the first joint, the resistance of the bow weight while drawing will cause the fingers to straighten slightly and roll the string in toward the bow, thereby holding the arrow on the shelf. If this problem persists, demonstrate and explain the student's own control of the arrow. This is done by intentionally rolling the string hand and bending the wrist away from the bow to take the arrow away from the shelf; then bring it back by straightening the wrist. Repeat this procedure two or three times.
22. In most cases, on the practice draw students automatically twist the upper trunk while holding the bow shoulder and bow arm in correct position. However, in some cases, particularly in women, the tendency is to draw the bow without twisting the top half of the body. In this case, stand facing the student when she is in position just prior to the draw. The bow arm should be extended toward the target and the fingers should be on the string. Ask the student to start the draw to anchor. As the student draws, put one hand on either side of her waist and lightly twist the top half of her body to the right. In most cases, this will immediately eliminate the problem, but occasionally it may have to be repeated two or three times. This correction is also used when a female student continually draws the string to the inside of the breast.
23. The elbow of the drawing arm should be higher than the plane of the arrow upon beginning to draw, through and including the follow-through.
24. In the follow-through, tell the students to "pose" and continue to aim, with the eyes focused on the center of the bullseye.
25. If a student has a release problem, have him relax the small finger and thumb of his drawing hand.
26. Use the point of an arrow to touch lightly the student's elbow when he has a tendency to collapse the elbow. This will cause him to pull harder immediately and raise the elbow.
27. Caution the student coach not to put his hand or any object such as an arrow through the area between the drawn string and extended bow hand.
28. If a student's hand remains at his face upon release, he is not pulling, but is plucking the fingers off the string.
29. Don't over-emphasize movement of the bow arm.
30. You can easily see if any arrow will completely miss the target on the first arrow during the pre-gap instruction by standing at the side to look at the angle of all arrows while students are at a practice full draw.
31. Stress consistency of form. Form does not change regardless of distance, method of aiming used, or type of activity (including archery games).
32. Instruct students to keep the little finger close to the neck or clothing at anchor point.

## TESTING AND EVALUATION

Students' proficiency and knowledge of archery can be evaluated by skill and written tests. Important phases of archery that should be tested are:

Safety rules	How to determine arrow length
Basic 10 shooting steps	How to determine bow-string length
Location of nocking point	Shooting form and accuracy
How to string a bow	Archery etiquette and terminology
How to score	
Two methods of shooting	

One college instructor uses the following grade distribution: Knowledge—30 percent; Shooting skill—30 percent; Shooting form—30 percent; Attendance, attitude, etc.—10 percent. Progression also should be considered.

**Skill Test** To ascertain shooting form and accuracy, a skill test is appropriate. To determine accuracy, a score should be given for a certain number of arrows. Charting each student's score every time the class shoots for score will indicate to the student his progress. To determine shooting form, the instructor can test the students' performance of the 10 basic shooting steps. He might wish to use a checklist with columns for "Stance," "Nock," "Draw," etc.

**Written Test** Each instructor should make up his own written tests based on the material covered in class. The following are sample test questions.

- T F** 1. The single most important phase in archery is consistency.
- T F** 2. To raise the arrow in sight shooting you lower the sight.
- T F** 3. The anchor point should vary according to the elevation of the target.
- T F** 4. The drawing elbow should be above the arrow level when the shooter is at full draw.
- T F** 5. When the whistle is blown once and the shooter is on the shooting line he may then nock his arrow.
6. The (oblique) stance is used in class.
7. To practice (instinctive) shooting you can use the pre-gap method.
8. The bow moves to the (left) and (down) after the release.
9. The odd-colored feather on the arrow is the (cock) feather.
- (e)** 10. To release the string, allow the fingers to do what?
- (c,g)** 11. What are the two important reasons for a consistent anchor point?
- (f)** 12. The arrow forms what angle with the string?
- (a)** 13. A sight is used with this method of shooting.
- (h)** 14. What muscles are used to relieve the pressure on the drawing arm?
- |                |             |
|----------------|-------------|
| a. free style  | e. relax    |
| b. instinctive | f. right    |
| c. rear sight  | g. velocity |
| d. forearm     | h. back     |

15. List, in order, the 10 basic steps in shooting an arrow.
16. What are the reasons for using the oblique stance?
17. Describe the action of the drawing hand upon release and follow-through.
18. How can you determine if you should shoot right- or left-handed?
19. Explain how to establish the high anchor point; the low anchor point.
20. Upon establishing your gap in instinctive shooting, your eyes should focus upon:
  - a. point of arrow
  - b. center of the target
  - c.nock of arrow
  - d. all of these
21. The third basic step in shooting an arrow is:
  - a. straight arm
  - b. nock arrow
  - c. draw
  - d. set hook
22. The bow should be held in the handshake position with:
  - a. all fingers extended
  - b. all fingers extended except index finger and thumb
  - c. only thumb and index finger extended
  - d. none of these
23. When establishing the deep hook, the thumb touches:
  - a. the little finger
  - b. the ear
  - c. the middle finger
  - d. the nock
24. The important reason for the oblique stance is:
  - a. balance
  - b. to prevent the string from hitting the bow arm
  - c. to allow the shooter to use back muscles
  - d. all of these

## **SAFETY POINTS**

The following safety points are important in archery and should be an integral part of the basic instruction.

1. Be sure students wear shoes on the archery range at all times.
2. Emphasize that a "loaded" bow is a deadly weapon.
3. Caution students never to show their skill as archers by using a human target or by permitting anyone to hold a target for them.
4. Allow students to shoot only at targets.
5. Caution students to use care in handling and carrying equipment and not to run with arrows held in the hand.
6. Explain to students that one member of a target group should always stand in front of the target while others are looking for lost arrows. If alone, an archer should place his strung bow in front of and across the face of the target to indicate that someone is behind the target.
7. Inform students that in field archery "Timber" should be called prior to shooting. Those who are walking away from the target at a distance should also be warned.

8. When an arrow or bow falls in front of the shooting line, caution the student to wait to retrieve it until the persons on each side of him have completed shooting. If the bow or arrow can be reached without stepping across the shooting line, the item may be retrieved and shooting continued. An arrow that falls out of reach is considered shot. During a class it is best to blow the whistle to stop the entire class and have the student pick up his equipment.
9. If an arrow is hanging on the target, blow the whistle to stop the class, remove it from the hanging position, and insert it back into the target in the correct scoring area.
10. Caution students always to keep a safe distance behind (or to the side) when arrows are being withdrawn from the target. An arrow suddenly jerked out of the target could cause severe injury.
11. Never use imperfect or inferior equipment, such as cracked arrows, arrows with fletching or point missing, cracked bows, or bows with frayed strings.
12. Caution students never to shoot arrows that are too short.
13. Be sure that students always use an arm guard and finger protector.
14. Be sure the archery range is supervised whenever shooting is under way.

## **ARCHERY ETIQUETTE**

With beginning shooters several courtesies should be established. They include the following items:

1. Don't talk to or disturb shooters on either side when they are shooting.
2. Be careful of bow movements; avoid any "jabbing" of your neighbors.
3. Avoid loud laughter or talk behind the shooting line, as beginners sometimes mistake it for personal criticism.
4. Stay at the shooting line until your target partner has shot his last arrow, then step back together. (It is much easier for your partner to shoot his last arrow when he is not the only one on the line.)
5. Never shoot another person's personal bow. You may overdraw without realizing it, damage the cast of the bow, or break it. Besides, it is his "pride and joy" and very private.
6. Be sincere when counting score — always be a good sport.

# **correlation of archery instruction with other interests and study areas**

Instruction in archery has great potential for correlation with other areas of study in the school curriculum, and with other program activities in camps, recreation agencies, and organizations. While archery skills and games are usually taught in physical education and recreation classes or through clubs, after-school programs, and camping and recreation activities, there are many aspects of archery which are appropriate in other areas of study. The history of the sport, the mechanics involved, the equipment used, and the health and exercise value can serve as content and motivation in a variety of programs. In schools, particularly, there are unique opportunities for team teaching in cooperative units involving archery instruction with other subject matter areas. While space does not permit a detailed description of all the possible relationships to other subjects and activities, a few examples are suggested below.

## *English and literature:*

Greek mythology related to the constellation Sagittarius	James Fenimore Cooper books
Robin Hood story	Reports and themes on some phase of archery
William Tell play	

## *Art:*

Sculpture and drawings related to archery – form and design	Designs for camouflage in hunting
Posters and signs illustrating forms and techniques	Diagrams of bows, flight of arrow

## *Industrial arts and crafts:*

Building storage racks	Repair of arrows
Making tackle items, instructional charts	Indian crafts, such as cordage

## *Science and math:*

Arrowheads	Flight of arrows
Use of wood and glass	Velocity, angles, leverage

## *Social studies:*

Relationship of archery to history of man and events	Indian history
--	----------------

## *Health and physical development:*

Effect on posture	Self-discipline
Muscle development	Release of tension



# archery games

## Tic Tac Toe

Place three rows of three balloons on a target matt. Divide the group into two lines, A and B, and have them stand in a single file 15 yards from the target. If the group is under 14 years of age, a distance of 20 feet is sufficient. Each group will have a captain who will be responsible for indicating to each team member which balloon he should shoot. At the signal to shoot, each captain will shoot one arrow and step back. The second and each succeeding person will shoot—one at a time—when ready, then go to the back of the line. The first team to break three balloons in any line is the winning team.

**Point of Safety:** No one should be allowed to take an arrow from his quiver until he is standing on the shooting line.

## Wand Shooting

Place a strip of 1-inch masking tape over the target face from top to bottom. The group is divided into teams as for Tic Tac Toe and the shooting rules are the same. A game is the best two out of three points. A point is scored when an arrow hits the tape anywhere on the target. When an arrow hits or looks as if it has hit, the range captain will blow his whistle and call the arrow. When a team has scored two points, it is declared the winner.

## Bird Shooting

Flu flu arrows are needed for this game, along with at least six commercial bird targets or 16-inch circular discs cut from heavy cardboard. Two teams are lined up as for Tic Tac Toe. The bird thrower should be to one side of the shooters and hidden from view if possible. When the two teams are on the line with arrows nocked, the range captain calls "Pull." The bird thrower can throw the bird at any time within 20 seconds after the call and at any elevation or angle. It is suggested that the birds be thrown across and in front of the shooters at a distance of no more than 10 yards. Each member of both teams should have at least three shots. Any hit (determined by the range captain) scores one point. The team with the highest score wins the game.

## Clout Shooting

This is not a regulation clout. The distance is 90 yards from the shooting line to the center of the target. Drive a 5-foot wooden stake into the ground for the center of the target. Attach a large (12-inch diameter) brightly colored balloon to the top of the stake as a marker. The clout is then scored and shot like a regular clout except that only four ends are shot. The competition is between total team scores. Any team that breaks the balloon gets an additional 50 points added to its

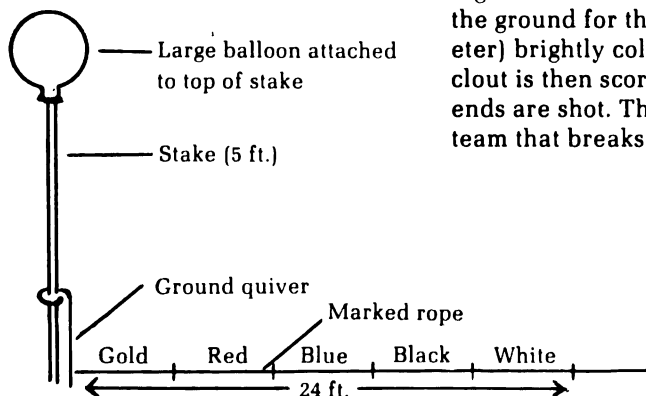


Figure 18. Clout target and scoring rope.

total score. Rope can be attached to ground quiver. The stake can then be removed when scoring, thus allowing the rope to rotate more easily for more accurate scoring.

### **Rabbit Shooting**

Flu flu arrows and balloons about 6 inches in diameter are needed. This game can be played only if there is some breeze. The teams are lined up as in Tic Tac Toe. An assistant is placed on the upwind side of the shooters. Upon a hand signal from the range captain, an assistant releases two balloons so that they will blow across about 15 yards in front of the shooters. After releasing the balloons, the assistant moves back quickly. The shooters may not shoot until the range captain blows his whistle, which he does as soon as he feels the assistant is out of shooting range. When the range captain blows his whistle again, all shooting stops. Sometimes it is possible for three or four people to shoot before the balloons are out of range. When one or both balloons are either broken or out of range, the range captain stops the shooting and has the assistant release two more. A time limit may be set, or the game ended when a certain number of balloons have been released. The team with the highest number of hits wins the game.

### **Roving Archery**

Small groups of roving archers pick targets randomly at varying distances (such as a bush, clump of grass, or old stump) and each shoots one arrow. The archer who hits the target or comes closest earns one point and chooses the next target. The winner is the archer with the most points.

The improvement of an archer's shooting skill is one of the elements that keeps an archer active. This is accomplished by developing a program that includes practice, individual instruction, and competition. Such a program requires an expansion of the basic group instruction for beginners. After an initial exposure to archery through group instruction, the individual has an awareness of basic shooting techniques and archery equipment. This section provides additional information for the archer and instructor in the understanding of why, how, and when certain functions of the archer or the equipment are important.

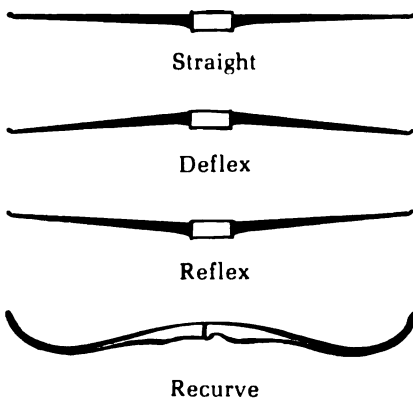
How do you attempt to answer the many questions about archery? What class or program will insure success for the teacher-coach or the archer? This section of the planning guide is just that—a guide. Your program is unique from all others. Thus, you should adapt and adopt those areas that will give your students the skill and knowledge that is desirable for your program. Ultimately, the archery student will determine the usefulness of the content.

# INTERMEDIATE INSTRUCTION

## equipment

### TYPES, SPECIFICATIONS, AND FUNCTIONS

#### Bows



The Archery Manufacturers Organization (AMO) has set standards for bow lengths. Previously, not all bows of a given length used the same length string. Since the introduction of the AMO standards, all bows of a given length currently sold by any manufacturer utilize the same length string. Rather than having to buy a string by its actual length, these standards are set so that strings can be sold according to the length of the bow for which the string is being purchased. For example, a bow that is marked "AMO Standard 66 inches" requires an AMO Standard 66-inch string. This standardization should be extremely helpful to the archery instructor since it will eliminate the confusion of determining the correct string length for the bow.

#### Bow design.

There are four basic variations in bow design in terms of limb configuration: straight, deflex, reflex, and recurve.

Bow makers (bowyers) strive for the ultimate combination of speed and stability in a bow. The following are some general principles of bow construction:

1. The shorter, heavier weight bow, whose prime purpose is hunting, is built primarily for speed of arrow flight rather than for stability. A shorter bow will shoot faster than a longer bow of identical limb design and weight because of the distance of bow tip travel and the fact that more of the limb is used in thrusting the arrow.

Figure 19. Bow limb configurations.

2. The longer, lighter weight bows are designed for competitive shooting and the materials, specific limb design, etc., are aimed at achieving a perfect balance of speed and stability.
3. The intermediate length bows (usually lightweights) are designed for recreational use and therefore both speed and stability are sacrificed in the attempt to bring to the public a reasonably priced, all-purpose bow.
4. A reflex limb design will cause a bow to be faster but less stable than a deflex bow of identical length and weight. The more reflex that is designed into a bow, the faster the cast (bow speed).
5. The deflex design gives much more stability but less speed.
6. The combination of deflex and recurve provides a greater stability (because of the deflex) as well as more speed (because of the recurve).

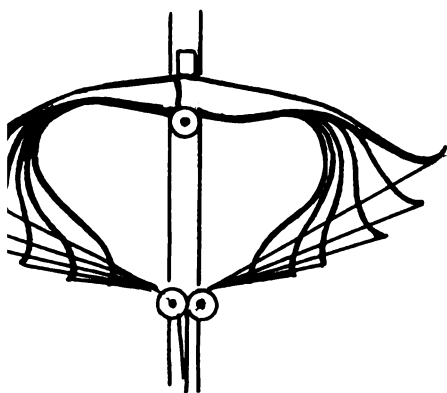


Figure 20. Hinges.

Bow limbs remain relatively constant in length. The difference in bow lengths is in the riser section of the bow and the design of the reflex, deflex, and/or recurve. The pressure that is absorbed by the bow limbs is quite high. When drawing a bow, the limbs (on a recurve) are straightened out and the pressure at certain points on the limbs—called hinges—reaches terrific proportions. A 40-pound bow drawn to 28 inches would have compression of approximately 180,000 pounds per square inch on the face of the bow and tension of approximately 135,000 pounds per square inch on the back of the bow. As the string is released, the pressures reverse themselves and the bow material must continually absorb this punishment. This clearly illustrates the elasticity and recovery qualities of the materials used in a bow.

This should also give a clear understanding of why a bow should never be shot without an arrow. The arrow helps absorb some of the pressure. The bow, if shot without the arrow, might otherwise continue to bend beyond its recovery position, snapping the string and limbs. Such an accident would be disastrous to the bow and hazardous to the archer.

#### **Bow materials.**

A bow shoots smoothly or roughly because of the materials used and how they are integrated into the bow design. The better and smoother shooting bows are composed of wood and fiberglass laminations. The predominate wood used is maple and both laminations (wood and fiberglass) are tapered on the better shooting bows. This produces speed while retaining smoothness.

**Stacking** is the excessive build-up of drawing weight. It is affected by both the design and materials utilized in the bow construction. Drawing weight will vary approximately 1½ to 2 pounds per inch. A bow measured at a 28-inch draw and marked at 40 pounds would be considered smooth if at 29 inches its draw weight was 42 pounds; if it increased to 48 pounds in 1 inch, this would be excessive stack.

#### **Bow weight.**

All bows unless otherwise marked are measured at a 28-inch draw. Consequently, an archer drawing more or less than the 28 inches will vary the draw weight by approximately 1½ to 2 pounds for each inch the draw length changes.

Using the AMO formula, the actual draw weight can be determined as follows: Divide the bow weight at 28 inches by 20; multiply by the number of inches the draw length differs from 28. Subtract or

add this amount to the bow weight at 28 inches, depending upon whether the draw length is shorter or longer. Examples:

1. Bow weight = 42# at 28"

Actual draw length = 25.5"

$$42 \div 20 = 2.1\# \times 2.5'' = 5.25\#$$

$$42 - 5.25 = 36.75\# \text{ at } 25.5'' \text{ draw length}$$

2. Bow weight = 38# at 28"

Actual draw length = 30"

$$38 \div 20 = 1.9\# \times 2'' = 3.8\#$$

$$38 + 3.8 = 41.8\# \text{ at } 30'' \text{ draw length}$$

Bow weight must be considered when selecting arrows with correct spine.

### **Bowstring height.**

The string height (formerly, brace height) is established by measuring from the base of the throat of the bow or the pivot point. If the string height is not given by the manufacturer, a new bow should be strung, and the string height measured and noted (preferably marked on the bow handle with a felt pen). For an old bow, contact the manufacturer for recommended string height. String height may be changed slightly by twisting the bowstring. A dacron-base string may be twisted one-third of a turn per inch, or generally up to 12 or 14 turns maximum. Always twist in the same direction as the string has been twisted. If it is a homemade string with no twists, twist in the same direction as the serving is twisted.

The archer should know that there are various grades of dacron. The more expensive, professional grade dacron has virtually no stretch and is a third as strong as the cheaper grades. Because of its additional strength fewer strands are needed, which makes it faster.

How does string height affect arrow flight? The height of the string determines the speed of the bow. The higher the string height, the slower the arrow will travel. The lower the string height, the faster it will be. The action of the recurve is suppressed if it is overstrung; this is called dampening the speed of the bow. An understrung bow will increase the speed of the arrow, causing more erratic shooting and wider grouping. It will also cause the bow to shoot noisily. In tuning a bow, many archers know through experience the sound of their bow so well that they can tell by the sound when the string is letting down.

### **Stabilizer.**

Stabilizers add weight to the bow thus helping to eliminate torque. Regardless of the anchor, when the archer is shooting a bow he is in a triangular position. The string, upon release, will attempt to realign itself with the bow hand, causing the bow to twist or torque every time an arrow is shot. The stabilizer does not eliminate the torque, but simply slows it down to enable the arrow to clear the bow before the torqueing action can affect the arrow flight.

The length and weight of the stabilizer will vary with the individual archer, his arrow length, and shooting style. Similar results of torque elimination can be accomplished by adding weight to the bow handle just below the hand.

### **Nocking point (Nock locator).**

The nocking point should be a little high (about 1/8 inch above the 90 degree mark) so that upon release the arrow is forced to lift. The

arrow stays on the rest only 2 to 3 inches; from that point it starts lifting and bending.

The nocking point is  $\frac{1}{8}$  inch above the 90 degree mark to push the arrow down on the rest, which actually causes the lift. The arrow then rises, bending out or around the bow. The bending of the arrow during flight is known as the *archer's paradox*. Thus, the feathers do not hit the rest but move out and around the bow. The longer the arrow is on the rest, the less control the archer has over the arrow. Ideally, at the moment of release, the arrow would jump completely off the rest.

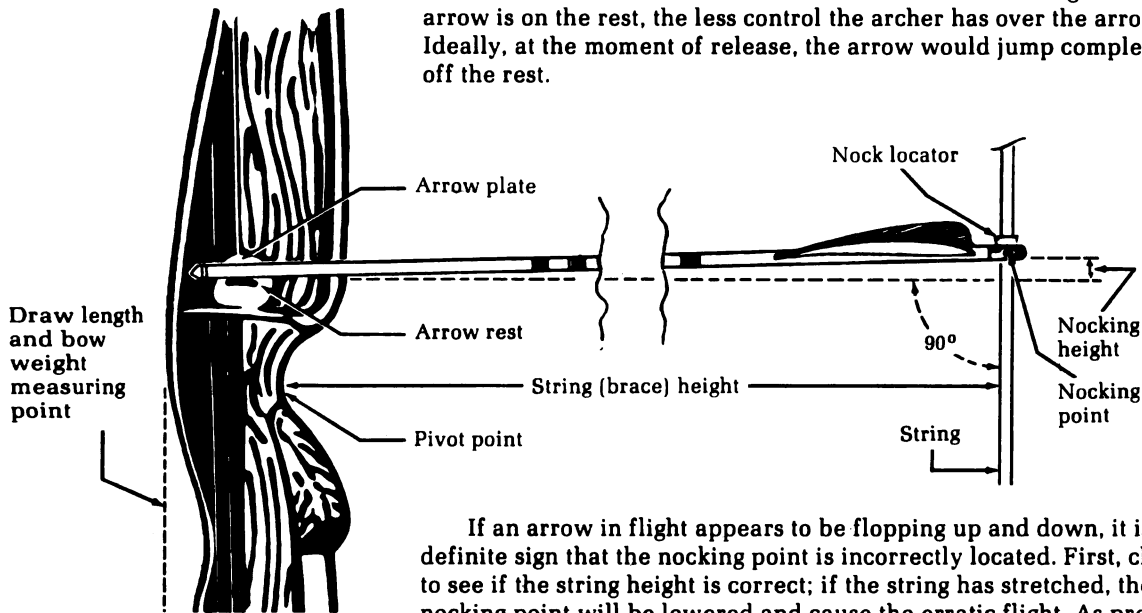


Figure 21. Detail of nocking point.

If an arrow in flight appears to be flopping up and down, it is a definite sign that the nocking point is incorrectly located. First, check to see if the string height is correct; if the string has stretched, the nocking point will be lowered and cause the erratic flight. As previously stated, a few twists in the string will bring up the string height and correct the nocking point problem. If this is not the cause, then remove the nock locator, make a pencil mark on the string, and shoot arrows until the proper nocking point is established by correct arrow flight.

For finer nocking point adjustment, stand 8 feet from the target (which establishes the arrow point approximately 6 feet from the bale) and shoot arrows at a target level with the height of your bow at full draw. If the shafts are parallel to the ground, the nocking point is correct; if the nock is higher than the point of the arrow, the nocking point is too high; and if the nock is lower than the point, the nocking point is too low.

#### Arrow rest.

All laminated, center-shot bows today have an arrow shelf created by the sight window. For consistent arrow flight there should be minimal contact below and to the bow side of the shaft. This is particularly necessary in lightweight bows used for tournament shooting, recreation, or instruction because the lighter the weight of the bow the slower the arrow travels. This means that the shaft will remain in contact with the rest and pressure point for a longer period of time, increasing the possibility of the shooter's bow hand movement affecting arrow flight. This situation becomes less critical as the bow weight increases, so that in the case of a hunting bow it is possible to shoot from a relatively large rest adhered to the shelf.

The arrow rest helps to clear the feathers from the shelf. Some bows have a solid shelf which causes drag and doesn't give the arrow enough lift to clear the feathers. This can be seen in the wear on the feathers after several ends are shot.

What is needed is "point contact" where the arrow shaft rests on a small area against the bow at a small contact area. Ideally, two pin heads—one sticking up from the shelf and one out from the bow window—would be close to a point contact arrow rest. This would give a very small area of contact with the arrow.

Determining the correct position of the pressure plate (point contact on the box window) requires some experimenting with your arrows. An arrow does not fly out of a bow in a straight line; because of the mass weight and sudden thrust against a linear object (arrow), the arrow bends. Thus, the archer's paradox is one reason for the spine testing of arrows and matched arrows. (See section on Arrows, p. 43.) This bending must be considered when placing the pressure plate at a certain distance from the surface of the bow window. Arrows matched to the bow will straighten out after traveling 6 feet.

One of the best ways to check the pressure plate position is to use aluminum arrows without feathers. Aluminum arrows are used because they are the most perfect arrows. Shoot the arrows into the target in the same way as described for establishing correct nocking point (p. 41). As the arrows strike the target at an angle, move the pressure plate out (some bows have a movable pressure plate) or build it up. This can be done by placing tape over a matchstick, building up layers of glue, or using a similar method. Some pressure plates are plastic and can be bent to a new position by warming the plastic. Shoot directly into the target and note the angle at which the arrows group. If the arrow nocks are angled to the left, move the pressure plate out; if the arrow nocks are angled to the right, move the plate in. Continue the adjustment until the arrows hit the target straight. When the bow is tuned properly the archer's paradox is minimal.

Most bow windows are cut past the center of the bow, which helps the arrow flight. The more expensive bows have adjustable arrow rests and pressure plates as standard equipment.

#### **Bow sight.**

A bow sight is essential for good shooting. Bow sights come in a variety of styles and costs. The four main types are: pin, post, peep, and cross hair. Individual preference will determine the type and its placement on the bow. The placement on the back of the bow seems most prevalent for short distance shooters, and placement on the face seems to prevail for longer distance shooters, allowing for higher elevation of the bow at long distances.

When the bow sight is on the back of the bow, some archers prefer a sight extension which moves the sight away from the archer. The farther the sight is from the archer, the more eye relief he gains and the better able he is to bring both the sight and the target into focus. To illustrate, bring your index finger near your eye and focus; then hold it away from your eye and focus. *CAUTION: The farther out the sight is extended, the greater the bow movement is magnified. It also shortens the vertical range of the bow sight.*

#### **String alignment.**

Proper string alignment is necessary for consistent shooting. Both string and bow reference points are valuable aids for the archer in establishing proper string alignment. The string reference point can be located in the following manner. (1) Have the archer draw to his anchor point several times and after you are sure he is drawing consistently to the same anchor, make a mark (with a felt pen) at eye level on the string. (2) Let down the bow and tie a small string (dark in



Figure 22. String reference point.



Figure 23. Bow reference point.



Figure 24. Wrist sling.

color) at this point to insure drawing to the same spot. (3) Again have the archer draw to anchor and place a mark on the bow at eye level to further aid head placement. (4) Use a small piece of masking tape on the face of the bow and place a dot, "x", or "+" on the masking tape for alignment. The head will be positioned so that the archer looks to the outside (arrow side) of the string.

A peep sight can also be used. It is made by splitting the string and inserting a peep sight between the strands of the string. Caution should be observed with the use of peep sights and eye level marks as they are not allowed in the FITA<sup>1</sup> round if they exceed one centimeter. This is a round that is shot in the national championships, the round to be shot in the Olympics, and the only round that is shot in the World Championships.

String alignment is extremely important for consistent shooting—in fact, more important than positioning the sight pin on the target. The margin of error in string alignment is more critical than error in placement of the sight pin on the target.

#### Bow sling.

There are two types of slings: a wrist sling and a finger sling. They are both designed to help the archer have a relaxed hold on the bow while maintaining a sense of security.

The important consideration is to maintain a consistent pressure. The sling should be snug enough to prevent the bow from jumping over 1 inch in the archer's hand. A common error is to use a bow sling that is so snug that the archer utilizes it as a brace. In some cases, a sling will stretch during use and change an archer's pattern of hits.

## Arrows

Arrows are a critical—possibly the most critical—part of an archer's equipment. Once an archer decides to pursue archery beyond the basic instructional stage, a quality, matched set of arrows should be purchased.

Arrows are matched to a bow by the spine of the arrow—the amount of flexibility in the shaft. The greater the draw weight of the bow, the stiffer the arrow shaft. Materials used in the making of arrows fall into three categories: wood (Port Orford cedar), fiberglass, and aluminum. Aluminum has proven to be the best material for precision matched arrows.

The spine of an arrow is related to the archer's paradox. It must be matched to the bow so that it bends the right amount and hits where it is aimed. Arrows that are too stiff will group to the left of the target; arrows that are too limber will group to the right of the target.

Most top tournament bows today have the following advantages: (1) the window is cut past center, thus the arrow lies directly in the center of the bow and (2) most have adjustable arrow rests and adjustable pressure plates. These improvements have greatly reduced the effect of the archer's paradox, thus allowing the archer to use arrows of two or three different spine weights with the same bow by tuning the bow to the arrow.

Arrow weight is very important and all arrows should be matched within 5 grains of weight. The weight distribution should be such that the point of balance of all arrows is the same within 1/32 inch.

<sup>1</sup>FITA (Federation Internationale de Tir à l'Arc) is the international archery federation.



# instruction

The competent archery instructor possesses a depth of understanding beyond beginning instruction. Effective instruction requires the knowledge and understanding of why certain techniques or methods are utilized.

## THE TEN STEPS IN SHOOTING

In this section a detailed analysis of the 10 basic steps in the shooting process is discussed with an emphasis upon individual rather than on group instruction. As an archer progresses he will modify his form and technique to fit his individual shooting style.

### Step 1 — Establish Stance



Figure 25. Oblique stance.

The oblique stance has been advocated for three basic reasons (p. 22). For the advanced shooter, a further reason for this stance is the position of the head during competition. It places the archer in a position facing the target and this eliminates from view the spectators behind the archer.

The stance is the foundation upon which the archer's form is built. The archer should spread his feet far enough apart to achieve a comfortable feeling. His feet should be firmly on the ground so that the entire foot—sole and heel—maintains contact. His weight should be evenly distributed between the two feet.

The body should be straight and perpendicular to the ground. The oblique stance places the body in approximately a 45 degree angle in relation to the target. This stance minimizes body sway. The knees should be locked to maintain body balance.

The stance should be accompanied with a confident attitude. An archer should learn to relax between each shot. Resting and relaxing allows the heart beat to return to normal. During rest periods the archer should review the previous shot and go through the 10 steps for his forthcoming shot.

### Step 2 — Nock Arrow

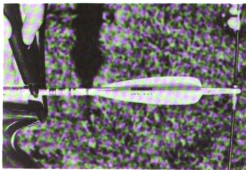


Figure 26. String height check.

The important point in nocking the arrow is to make it simple. There is no one correct way to do it, but it should be done the same way each time. A pattern will evolve as the archer shoots over a period of time. Establishing a pattern permits the archer to eliminate thinking about nocking the arrow and thus allows him to prepare himself for the shot.

When the string height is established, the archer should nock each arrow and make a small mark on the shaft where it meets the bow face. This affords a quick check for the archer to see if the string height is correct each time he shoots.

The serving diameter should be enlarged so that the nock of the arrow fits snugly on the string. The archer should check to make sure there is no gap between the string and the throat of the nock. If there is a gap, the arrow will fly differently on each shot.

To build up the nocking point the archer can use dental floss wrapped on the serving. After several wrappings, the floss should be heated with a match or lighter held under the spot. This will melt the wax in the floss, making a smooth nocking point.

### Step 3 — Set Hook



Figure 27. Setting a hook.

The fingers must be placed on the string the same exact way each time. It should be a very deliberate and thoughtful act. As the tab wears in, the archer will begin to feel the pressure of the string against his fingers. He should search for this pressure against his fingers on each arrow. The string pressure should be distributed on all three fingers, with slightly more on the middle finger. It is very important for the archer to give attention to this step each time he shoots. With the string lying in the first joints of the three fingers, the archer gains the feeling of strength, confidence, and control of the string. Many arrows have been shot involuntarily as a result of a flinch while holding on the target when the string is positioned on the pads of the fingers.

The fingers should be placed on the string with the index finger above the arrow and the other two below. This is called the *vent style*. Only slight contact with the arrow should be felt with the index and second fingers. If the archer places three fingers below the arrow, caution should be observed as this may throw the bow out of tiller.

Laminated bows, because of the material and construction, seldom have more than a  $\frac{1}{4}$ -inch difference in length between the upper and lower limbs. If the archer draws back below the center of the string, the limbs will recover at an uneven rate upon release. Thus, "walking the string" with the drawing hand has such a terrific effect on bow limbs that some have broken under this procedure. Because of the slight difference in limb length (the lower limb is slightly shorter than the upper limb), the lower limb is actually stiffer and faster so that both limbs recover at the same time. This is called *tiller*.

### Step 4 — Establish Bow Hold



Figure 28.  
Bow hold.



Figure 29.  
Raising the head.

In holding the bow, as in all other aspects of shooting, consistency is required. The archer's hand must be placed on the bow exactly the same way each time. This becomes critical especially after shooting continuously for an extended period of time. Fatigue may cause the hand to change its pressure point. A slight change in the pressure point of the bow hand will throw the arrow off slightly.

The tiller of the bow is affected by hand pressure. The hand position is below the center because the arrow is shot from the center of the bow. This hand position "dampens" the limb action of the lower limb, requiring the lower limb to be stiffer.

The deliberate placement of the hand on the bow is termed "working the hand into the bow handle." This occurs before the bow is raised. To avoid hitting anyone with the bow while on the shooting line, the archer should place the tip of the lower limb between his legs. The bow wrist should be relaxed, causing the wrist to break or cock when the string is drawn back. By basically assuming the position of a tired wrist, the pressure point on the bow will not deviate as the wrist becomes fatigued during extended shooting.

After the archer is sure that the hand and sling (if used) are exactly as he wants them to be, he should check the bow arm. The bow arm should be straightened and set before raising the unit to eliminate further thought about the arm.

### Step 5 — Raise Head

Up to this point, concentration has been on the bow. Now the archer's focus is transferred to the target; it will take a transition or adjustment period to shift the concentration to the target. The archer's head should be in a natural position looking directly at the target, not canted (tilted) in any direction. This action sets the body and shoulders in a correct position.

## Step 6 — Raise Unit



Figure 30. Raising the unit.

## Step 7 — Draw — Anchor



Figure 31. Drawing to anchor.

By this time, the archer has prepared himself mechanically for shooting by establishing his stance, setting his hook, positioning his bow hand and arm, and raising his head. While concentrating on the target center the archer should raise the bow in a deliberate manner and focus his eyes on the sight or on the target.

Although the sight can be used to orient the bow, the archer should concentrate on the draw and anchor without worrying about keeping the sight directly on the target center.

The elbow of the drawing arm should be slightly elevated—not level. Two reasons dictate this position: (1) it gives the archer greater strength and back tension with the elbow up and pulling around in back rather than pulling straight back, and (2) the slight elevation affords a better hand position for the low anchor (the line of the jawbone rises as it goes back). The archer should get the feeling of strength, which is better accomplished with the elbow raised.

The drawing hand should be completely relaxed, with special attention given to relaxing the back of the hand and thumb. The draw should be felt in the shoulder and back muscles—not in the arms and hands.

The use of a pointer may help in pointing out where to relax. Telling the archer to relax may not produce the correct results. Use of a pointer, touching the shooter where he should relax, works like an electrical impulse to the muscle; it seems to work much better than touching him personally.

The low anchor should be established by the use of specific reference points. The string against the nose, lips, and chin are three reference points to check. The archer's hand position should also be checked. The chin should rest on the index finger with the thumb relaxed against the neck.

During the movement of drawing to anchor, the archer should take a deep breath, exhale about half of the air in his lungs, and hold his breath.

## Step 8 — Aim — Hold

Perhaps the single most important part of aiming is concentration. The archer should hold his breath with enough air in his lungs to allow him to relax until the arrow is released. He must maintain pressure on the bow and bowstring with his back tension to insure a proper anchor point. After aligning the string, the archer should move the sight pin slowly onto the target center.

There are two places the archer may focus his eyes—on the target center or on the sight pin. Focusing upon one place causes a blurring of the other. If the eye(s) are focused upon the target, the same focus is retained as described in the beginning instruction. It is also consistent with the method employed in instinctive aiming. Some archers find it easier to focus on the sight, which may cause a problem called *eye drift*. Because of previously established eye focus on the target, the archer may switch the focus between the sight and the target while aiming and release the arrow somewhere between the two focal points.

It has been said that aiming is 90 percent psychological and 10 percent physical. The archer should accept as a phenomenon of aiming that no one can hold completely steady. Heart beat, nerves, and muscle tension all contribute to slight movement. The inability to cope with this movement may cause a psychological phenomenon called *target panic*. For the competitive archer, target panic must be

understood and dealt with. The oscillation or movement of the bow sight within the target center is acceptable.

The *hold* during the shooting of an arrow is the time it takes to move the sight onto the target center after all other previous steps in shooting have been completed and maintained. This normally takes from 5 to 10 seconds. At around 10 seconds and beyond, fatigue sets in and it is best not to shoot, but to let down and relax before starting the steps again.

## Step 9 — Aim — Release

When the archer has the sight where he wants it (remember, it will oscillate—just be sure it is oscillating within the target center), he should concentrate on tightening his back to trigger the release. Relaxing the fingers of the drawing hand releases the string. It should be a totally unconscious effort, for when everything is right the fingers relax and the arrow flies forward as the string slips from the fingers.

If the archer must talk himself through the release he is in trouble—for instance, "I almost have the sight there; I am almost ready; there it is; let go." This type of release is known as a freezing condition. It is a deliberate release which has been triggered by the wrong approach.

During the release the archer must continue aiming. The unconscious act of a smooth release is more important to a good score than the actual aiming.

Just prior to the release of the arrow, many archers strive to hold the sight pin dead still instead of having it oscillate in the center. Fatigue sets in and results in a poor shot with the archer just thankful to release the arrow.

## Step 10 — Aim — Follow Through

The follow-through is the act of maintaining the physical position and mental condition achieved at the time of arrow release until a specified time lapse after the release. The bow is pushed slightly to the left and down, and the drawing hand rubs the neck as it moves back and around the neck. The tension maintained in shoulder and back muscles by pushing on bow and pulling on string causes this reaction.

It is important that the drawing arm and wrist and the bow wrist are relaxed. Tension must be felt only in the shoulders and back.

The purpose of the follow-through is to insure that the archer continues the act of aiming long enough to allow the arrow to clear the bow. If the archer fails to follow through until the arrow clears the bow, his movements may affect the arrow flight. A poor follow-through often results in a relaxing habit that causes the archer to lose his back and shoulder tension.

Eye control during the follow-through is an important factor. If the archer's focal point stays on the target center, regardless of where the arrow hits, complete eye control is maintained. If the eye tends to follow either the bow or the arrow, then eye control is lost.

The key to where the arrow goes is often directly related to where the eye is focused. The archer may think he is picking up the flight of the arrow in the air while he may, in fact, be focusing his eye at that point just prior to the moment of release.

If the archer focuses his eye on his sight instead of the target center, the problem is more difficult. At the moment of release the bow moves to the left and down, but if the archer has complete eye control everything in front of him will be blurred. His focal point should be in mid-air in front of him, and this blurred vision should remain for a second or two for perfect eye control. This is not difficult to master.



Figure 32. Follow-through.

## CAUSES OF FAULTY ARROW FLIGHT

### High Arrows

*Peeking*—head goes up after the archer releases the arrow

*Jerking*—jerking the fingers off the string on release

*Heeling the bow*—putting pressure on the lower portion of the thumb which activates the lower limb

*Leaning back*—bending at the waist, pulling a shorter distance by leaning back

*Freezing (Target panic)*—physically unable to release the arrow when sight is on center of target; motivated by fear of missing the target center

*Warped arrow*

*Overdraw*—pulling arrows beyond normal anchor point

*Miss-set sight*

*Bending an arrow*—pressure applied to the arrow nock with the top finger of the drawing hand

*Bad nock*—nock not positioned properly on the arrow

### Low Arrows

*Collapse*—losing back tension, allowing the drawing hand to move forward; arrow creeps forward before being released.

*Overhold*—maintaining the hold beyond the physical capabilities of the archer, resulting in loss of back tension and hunching of the forward shoulder

*Soft release*—loss of finger tension and forward motion of drawing hand, usually associated with the overhold

*Head angle*—lifting the head as the draw is under way

*Bad string*—as the string lets down (individual strands may be breaking), string height is lowered.

*Bad nock*

*Miss-set sight*

*String hitting the arm guard*—evidenced by wear on the arm guard; may be caused by hunching the shoulder resulting in improper alignment, or poor bow wrist alignment

*Wind direction*

### Arrows to the Left

*Bow cant*—holding the bow with the window turned slightly to the ground

*Tension in the string hand*—cupping the drawing hand instead of having the back of the hand relaxed and straight

*Body sway or tilt*—tendency to lean back on heels; can be the result of improper alignment of the feet

*Plucked string* (different from jerking)—bringing the string away from the face and then releasing

*Alignment*—improper alignment of the bow, body, or string

*Tab too thick*—fingers unable to get around the string, causes plucking of the string

*Miss-set sight*  
*Wind direction*

## **High Right Arrows**

*Jerking release*

*Change in finger pressure*—normally caused by the index finger

*Heeling the bow*

*Peeking*

*Bow torque*—grabbing the bow forcefully on release, causes bow to twist in the hand

*Poor alignment of string and body*

*Overdraw and head twist*—head not directly at the target, but still drawing to the correct anchor point

*Wind direction*

## **Low Left Arrows**

*Collapse*—soft release, plucking the string and body twist

*Wrist break*—affects the person who uses the extended wrist; as he releases, the wrist relaxes or breaks.

*Bow torque or string alignment*

*Wind direction*

## **ANALYSIS OF MUSCLES USED IN SHOOTING**

From an advanced archery instructor, students will demand more detailed feedback as they attempt to refine their shooting technique. Their confidence in their coach will very much depend upon his ability to provide logical and understandable answers to their shooting difficulties. Failure to provide such answers can undermine the coach's status as an "expert" and severely limit his effectiveness.

The role that physical conditioning plays in enhancing the chances of success in competitive shooting is recognized by most archery teachers. An understanding of the muscles used in shooting can greatly increase a coach's ability to provide insights concerning proper shooting techniques and help him to formulate a beneficial exercise program. Using proper names for muscles and bones provides a common language to communicate effectively with students.

In this section an attempt will be made to show the relationship between the 10 basic shooting steps (the mechanics of shooting) and the musculature used in shooting. Insight into exercises that develop muscle strength and endurance will be provided.

## **Joint Movements**

Establishing a nomenclature concerning the movements of joints is necessary so that body movements can be described with accuracy. Listed below is a brief description of the movements used in shooting.

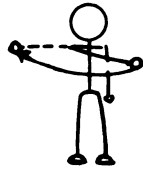


### **Abduction of the humerus.**

The upper arm is raised away from the midline of the body.

Figure 33. Abduction  
of the humerus.

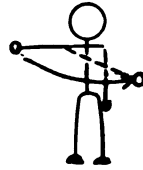
Figure 34. Horizontal abduction of the humerus.



**Horizontal abduction of the humerus.**

The upper arm moves through a transverse plane away from the midline of the body at shoulder level.

Figure 35. Horizontal adduction of the humerus.



**Horizontal adduction of the humerus.**

The upper arm moves through a transverse plane toward the midline of the body at shoulder level.

Figure 36. Outward rotation of the humerus.



**Outward rotation of the humerus.**

The upper arm rotates along its longitudinal axis away from the midline of the body.

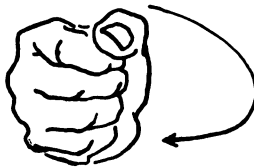
Figure 37. Inward rotation of the humerus.



**Inward rotation of the humerus.**

The upper arm rotates along its longitudinal axis toward the midline of the body.

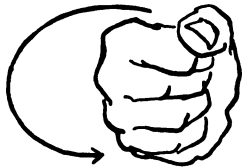
Figure 38. Pronation of the radius and ulna.



**Pronation of the radius and ulna.**

The forearm and hand rotate toward a palm-down position.

Figure 39. Supination of the radius and ulna.



**Supination of the radius and ulna.**

The forearm and hand rotate toward a palm-up position.

Figure 40. Extension of the radius and ulna.



**Extension of the radius and ulna.**

The forearm moves away from the upper arm.

Figure 41. Flexion of the radius and ulna.



**Flexion of the radius and ulna.**

The forearm moves toward the upper arm.

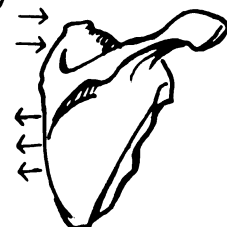
Figure 42. Abduction of the scapula.



**Abduction of the scapula.**

The shoulder blade moves away from the midline of the body.

Figure 43. Adduction of the scapula.



**Adduction of the scapula.**

The shoulder blade moves toward the midline of the body.

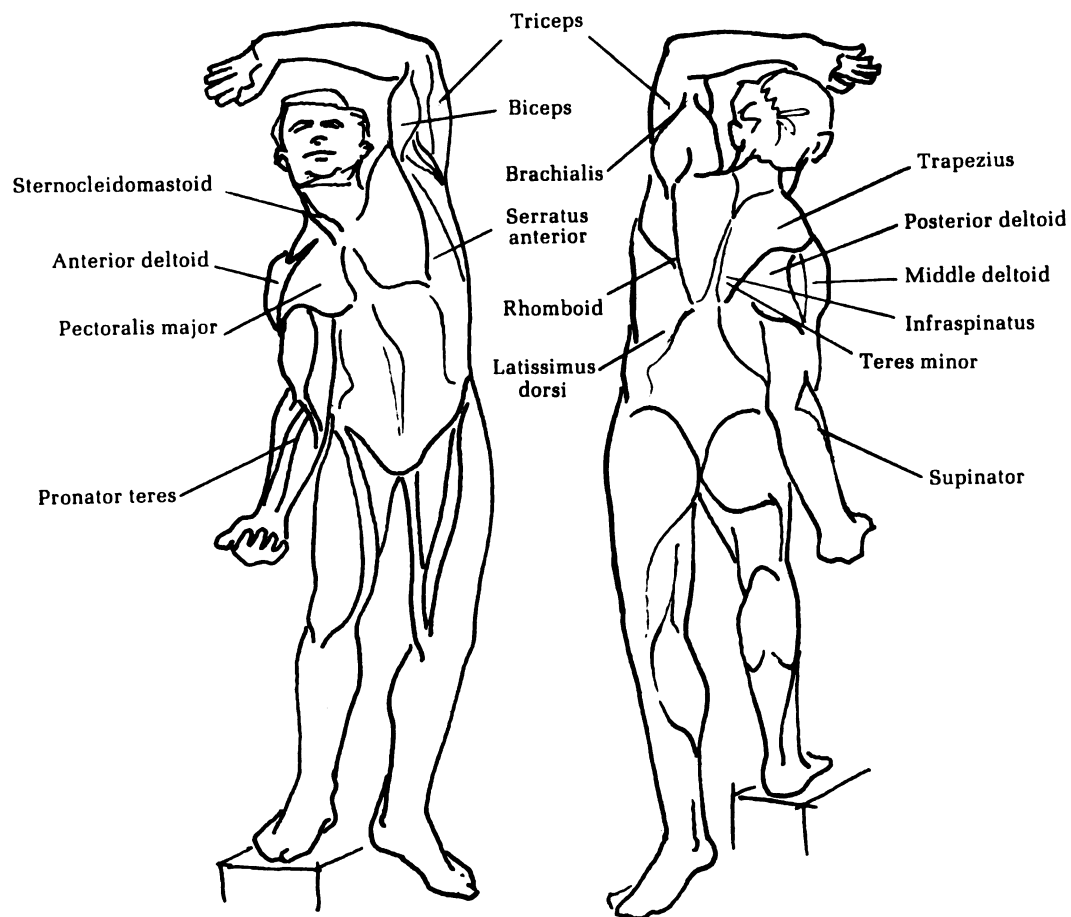


Figure 44. Muscles used in archery.



Although the terminology concerning the movements of bones and joints may be simplified in talking with students, it is necessary that the instructor understand the kinesiological terms used by professional physical educators and coaches. Rather than referring to the adduction of the scapula, he may say, "squeeze your shoulder blades together." The use of a few kinesiological terms enhances the students' confidence in the expertise of their archery teacher.

Significant muscle tension is not required in all phases of the shooting act. When considered in light of the 10 basic steps in shooting, muscle movement is extremely important only in Steps 6 through 8. The kinesthetics involved in each step of the basic 10 will be considered, with a detailed muscular analysis of Steps 6 through 8.

### **Step 1 — Establish Stance**

The standing position is not a completely relaxed one. Gravity constantly attempts to collapse the body parts upon each other. Maintaining an erect position requires the active contraction of the body's extensor muscles. Standing is not a completely immobile position. The body sways in an anterior-posterior direction. The sway is caused by the antagonistic contractions of anterior and posterior muscles as we attempt to maintain balance. Fatigue tends to increase postural sway. The oblique stance is recommended because it minimizes the effect of postural sway upon shooting accuracy and increases the angle between the bow arm and the return path of the string.

### **Step 2 — Nock Arrow**

Nocking the arrow on the bowstring requires some muscular coordination. However, because the muscle movements involved are unimportant, they will not be discussed here. For a discussion of the proper technique of nocking an arrow, see pp. 24 and 44.

### **Step 3 — Set Hook**

The first three fingers of the drawing hand are placed on the string so that the nock of the arrow rests between the first and second fingers. The fingers are flexed in a hook position by the flexor digitorum muscles of the forearm. The string is placed in the groove formed by the first metacarpal joints of the three fingers (deep hook).

### **Step 4 — Establish Bow Hold**

The extensor and flexor muscles of the wrist contract statically to stabilize the hand in an extended position. The muscles that are primarily responsible for stabilizing the wrist joint are the: flexor carpi radialis, flexor carpi ulnaris, extensor carpi radialis longus, extensor carpi radialis brevis, and extensor carpi ulnaris. These muscles are located in the forearm. The static contraction of the biceps, brachialis, and triceps stabilizes the elbow joint in an extended position. A slightly greater contraction of the biceps and brachialis prevents hyperextension.

### **Step 5 — Raise Head**

Proper head position is maintained by contracting the trapezius and sternomastoid muscles. The trapezius muscle keeps the head in an erect position while the sternomastoid rotates the head toward the target. Proper head position ensures good alignment with the target.

### **Step 6 — Raise Unit**

The bow is raised and extended toward the target so that all the body parts are aligned with the intended flight of the arrow. Aligning the body parts prior to the draw increases the consistency of the drawing action. The entire upper body of the archer is involved in raising the

unit. The bow arm and hand raise the bow and extend it toward the target; the drawing hand and arm grasp the string and position it for the draw.

Raising the bow involves action of the bow hand, arm, and shoulder. The deltoid muscle abducts the humerus so that the upper arm is perpendicular to the midline of the body.

Raising the drawing hand and string involves action of the drawing hand, arm, and shoulder. The deltoid muscle abducts the humerus. At the same time, the pectoralis major and anterior deltoid muscles horizontally adduct the humerus. The resulting action raises the elbow so that it is perpendicular to the midline of the body and extends the upper arm forward toward the line of flight. The humerus is also inwardly rotated by the latissimus dorsi muscle. The triceps muscle extends the forearm and hand forward with the string as the pronator teres rotates the forearm inwardly and the string assumes its perpendicular position with the ground. The serratus anterior abducts the scapula to aid in extending the arm forward with the string.

### **Step 7 — Draw — Anchor**

Drawing the bowstring requires the greatest dynamic muscular effort on the part of the archer. The fingers, arm, and shoulder of the drawing hand rotate with the string back to the anchor point. The greatest muscular tension should be supplied by the muscles in the shoulder and back. The rhomboid muscles, aided by the trapezius muscle, adducts the scapulae, sliding them toward the vertebral column. The humerus is horizontally abducted by the posterior portion of the deltoid muscle, pulling the elbow back in alignment with the intended flight of the arrow. The biceps and brachialis muscles flex the elbow. The muscular tension in the biceps and brachialis should be much less than that felt in the posterior deltoid, rhomboid, and trapezius muscles. The flexor digitorum muscles contract statically against the tension of the string in the deep hook. In the bow arm, the muscles of the forearm and shoulder contract isometrically and stabilize the humerus, radius, and ulna in an extended position.

### **Step 8 — Aim — Hold**

The hold after the draw requires the greatest muscular effort on the part of the archer. The hold portion should be long enough to initiate a consistent releasing pattern without creating undue fatigue and tension on the drawing hand and arm.

### **Step 9 — Aim — Release**

The release might be described as the sudden absence of muscular tension in the drawing hand and arm. The flexor digitorum muscles are relaxed and the string slides away from the fingers.

### **Step 10 — Aim — Follow Through**

The follow-through is the controlled relaxation of muscular tensions in the upper body after the arrow is released. It is unnecessary for the archer to hold a rigid static position after releasing the arrow. Instead, he should relax muscle tension gradually with a feeling of complete control.

## **CONDITIONING EXERCISES**

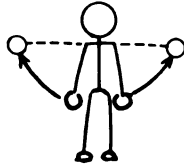
Archers should possess a sufficient level of physical strength and stamina to meet the demands of participation. It is obviously unnecessary for a recreational shooter to train as strenuously as a highly competitive one. Beginners should possess enough strength and endurance to enable them to participate in instruction with ease and success. The

bow must be drawn without undue strain a number of times during each instruction period. Struggling to complete the draw hardly lends itself to an efficient learning situation.

A physical conditioning program can benefit both the beginning and the expert shooter. The responsibility of an archery instructor is to design an exercise program that meets the needs of students. The goal is to improve their fitness level as efficiently as possible.

Below are a few specific strength development exercises that might be utilized as a portion of an overall conditioning program. These exercises are specifically designed to strengthen the muscles used in drawing a bow.

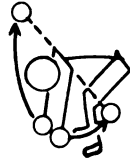
Figure 45. Exercise 1:  
Lateral raise—standing.



**Lateral raise.**  
(Standing)

With a dumbbell or other weight in each hand, the arms are abducted to shoulder level. This is primarily a deltoid exercise.

Figure 46. Exercise 2:  
Lateral raise—leaning.



**Lateral raise.**  
(Leaning)

The upper body is leaning over so that it is parallel to the ground. With a dumbbell or other weight in each hand, the arms are abducted horizontally to shoulder level. This is an exercise for the trapezius, rhomboids, and posterior deltoids.

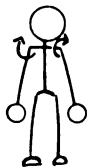
Figure 47. Exercise 3:  
Two arm curl.



**Two arm curl.**

With a dumbbell in each hand, the arms are stabilized against the sides of the trunk and then the forearms are flexed. This exercise strengthens the biceps and brachialis muscles.

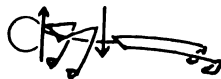
Figure 48. Exercise 4:  
Shoulder shrug.



**Shoulder shrug.**

While holding a dumbbell in each hand the shoulder blades are elevated and adducted. This exercise strengthens the trapezius and rhomboid muscles.

Figure 49. Exercise 5:  
Pushups.



**Pushups.**

From a front leaning position, the arms are alternately extended and flexed. This is primarily an exercise of the triceps and pectoralis major muscles.

Figure 50. Exercise 6:  
Finger flexor.



**Finger flexor.**  
(Ball Squeeze)

A tennis ball or modeling clay is squeezed. This exercise strengthens the flexor muscles of the fingers.

A supplemental jogging program to improve the cardiovascular condition of archers is highly recommended. The Air Force Twelve-Minute Aerobics Program might be considered.<sup>2</sup>

**PRACTICE** The purpose of practicing a skill is to develop certain behavior patterns. To be a highly successful archer requires consistency in some very complex and sophisticated muscular movements. These movements are developed to the point where the learner does everything the correct way each time he shoots.

It is beneficial for an archer to experience a degree of success throughout his practice sessions. Successful performance is a strong motivational factor that stimulates him to continue participation. This is as true for the beginner as for the advanced archer.

The capacities of the learner are important considerations when teaching advanced students. Their attention span, strength, age, and climate for learning (including home environment and desires) are some of the factors that influence practice.

During practice sessions, emphasis should be continually placed on following the 10 basic steps (p. 21). "Grooving" in archery is very important as it establishes a pattern or procedure for the archer to follow. In turn, the archer gains greater control over himself and his shooting accuracy.

### **General Learning Principles**

1. The motivated learner learns more rapidly. The motivation should be relevant and appropriate in degree.
2. The learner is likely to learn much more from practice than intended — especially attitude. The instructor should be sure to display correct attitudes and values as a model.
3. Generally, the learning curve tends to be higher with increased skill; the increments of increased performance are smaller because there is less room for improvement.
4. Learning takes place best when the learner is not completely satisfied with his performance.
5. Failure is a great psychological pain and it is important for the archer to recognize both his progress and his problems. He feeds on the success of his progress in order to overcome his problems.

### **Practice Tips**

1. Practice in an atmosphere that promotes concentration. Do not allow the range to become a coffee clatch; it should be quiet so that the archer's concentration is on shooting.
2. Allow the archer time to adjust psychologically to being closely watched by you. It may take several arrows or sessions, but the archer will eventually feel at ease as his shooting is observed and analyzed.
3. Space practice appropriately; it is preferable to mass practice.
4. Practice only when the archer can take his time on each arrow. A dozen arrows in five minutes does not promote good shooting. It would be better to skip a practice if it must be hurried.
5. If the archer must force himself to practice, don't insist that he continue. It would be better to skip one or several sessions until he wants to improve his skill. If the archer hits a slump in his shooting and everything seems to be going wrong, stop and help

<sup>2</sup>Kenneth H. Cooper, *Aerobics* (New York: Bantam Books, 1968).

him analyze what is happening. (He may acquire an exceptionally bad habit along with great frustration.) Then at the next practice session, try to resolve the difficulty.

6. In a diary or log, list problems encountered during practice sessions and when they were overcome. This makes the archer conscious of his improvement and helps him analyze his shooting.
7. Practice must have specific, obtainable objectives to be accomplished each session. Emphasis should be on shooting individual arrows, not tournaments.
8. Provide the archer with appropriate feedback, such as videotape, cameras, and mirrors.
9. When scoring in practice, always take the lower score on questionable arrows to eliminate any inflated average. If the archer knows that his improvements are genuine, his confidence in his shooting ability is enhanced.
10. Caution the archer not to expect higher scores when shooting in a tournament than his average in practice. Keep a daily average *by the end* (not by the game) and a running average by the end.
11. Practice should uncover the number of arrows needed for the archer to warm up. Knowing how long to warm up (practice) before shooting for score is essential for the competitor.
12. To take the boredom out of practice, use one session weekly to experiment. For example, ignore scores, shoot for patterns, change head angle, shoot facing the sun, or change the lighting.
13. When the archer reaches a plateau and possibly regresses, he very often will think that his equipment is holding him back. When such a peak is reached it may help to have another archer shoot with his equipment to help convince him that it is he and not the equipment.
14. The use of extremes may be necessary to correct faulty shooting form. Remember, deficiency in basic form causes most problems.

### **Points to Concentrate on During Practice Sessions**

1. Analyze with the archer what he needs to work on and spend one or several periods in establishing the correct technique. It is better to stress the positive or correct technique than to emphasize the archer's error(s).
2. Help the archer develop concentration—a state of withdrawal from all external noise and distractions. Continually work on the archer to think through each arrow. As he improves on his thinking about each arrow, he will improve his concentration.
3. When shooting a field course, pick a particular distance at which the archer needs to improve. Have the archer try to increase his score at this distance by one point. After he has improved his skill at that distance, have him work on others until he recognizes that improvement of score depends on each individual target. As each distance is improved upon, each arrow becomes critical. Such practice develops an excellent competitive attitude.
4. Establish the time at which the archer wants to be shooting his best. Form, grooving, physical conditioning, and psychological motivation should all build momentum as the major goal approaches. As the tournament approaches, practice sessions should increase in number and duration, and the archer should shoot more often at the tournament distances.

# **intramural program**

As the archer progresses from the beginning stages to a more advanced stage, his interest can be enhanced through participation in competitive activities such as intramural and Junior Olympic programs. An intramural program is an important step in providing inexpensive, convenient, and continued opportunities for students who want to pursue further activity in archery. The inclusion of archery in the intramural program also allows exposure to archery by students who are not enrolled in the skill courses.

Archery can be a year-round activity and need not be relegated to a seasonal program. League shooting can be established as well as periodic all-school tournaments. Indoor and outdoor tournaments and rounds can be conducted, including archery golf, clout shoots, field rounds.

For some of the tournaments it may be necessary and desirable to cooperate with local clubs and archery lanes. Archery golf can be shot on a local golf course during the off-season. The tournaments might be expanded to include local archers and/or other schools. Usually, local archery organizations will reduce fees to accommodate such events because they, too, are interested in promoting the sport. Remember to include novelty shoots and a variety of rounds to help keep the archers interested.

At the elementary school level, programs might be conducted during recess periods, noon hours, and in after-school programs. Junior and senior high schools can hold sessions before school in the morning, during the noon hour, or immediately after classes are dismissed in the afternoon. College programs can be conducted during supervised periods during the day, late afternoon, or evening. Saturday programs could be included at all levels. Extramural programs can also be established with other schools on a play day basis or by calling in scores to a central office while the tournament is shot at each local school site.

Participation in archery can be enhanced through the establishment of a club. If a group increases in participation, by all means establish such an organization. If, however, it impedes the goals of the archers, it would obviously not be worthwhile. The club could establish leagues, sponsor tournaments, and develop needed facilities and equipment in a long-range program.

Many intramural directors are inexperienced in archery and may need assistance from the archery instructor and the archers themselves. Volunteering services in the first year may determine the program's success and, in fact, whether or not archery will continue in intramurals.

Publicity is one of the most essential aspects of a successful program. Determine in advance what must be accomplished. Contact teachers and students through school newspapers, posters, word of mouth, duplicated handouts, and pictures. Provide information on the kind of tournament, awards, and equipment needed. Explain when and how to sign up and where the tournament is to be held. Increase the amount of publicity as the tournament time approaches. Advance sign-up boards give a good indication of how many participants can be expected. Provisions should be made for people to sign

up on the day of the tournament so that entries are not closed prior to the event. Post previous records and encourage beginners to enter by having divisions for various skill levels.

Practice sessions should be provided for students, with proper supervision and equipment available from the physical education or intramural department. A check-out system should be arranged so that whatever equipment is furnished for classes is also available for practice sessions.

Following a tournament or a weekly league shoot, post the scores. Everyone is interested in the results and participants want to know team and individual standings.

Some schools include tournaments in physical education classes, giving many students who might not otherwise participate an opportunity to shoot. Such an activity could be used as a qualifying round, in which a team or a certain number of the archers could be selected for an additional tournament.

Bump boards or ladder tournaments also create interest. Position on the ladder tournament is established by an initial shoot. Positions are then determined by the weekly shoots. Match shooting can be established by selecting shooters from different classes or leagues to compete in what could be called an all-star tournament.

Five ingredients important for a successful tournament are:

1. Purpose of the tournament
2. Advance planning
3. Development and adherence to tournament rules, time schedule, etc.
4. Effective publicity and communications
5. Evaluation of the tournament (what are the problems that weren't foreseen; how can it be conducted more successfully next time?).

Specific information on tournament rounds can be obtained by writing to the American Archery Council (AAC) or its member organizations: the American Indoor Archery Association (AIAA), Archery Lane Operators Association (ALOA), National Archery Association (NAA), National Field Archery Association (NFAA), and the Professional Archers Association (PAA). (For addresses, see Bibliography, p. 64).

The NAA has developed a Junior Olympic Archery Development Program for those under 18 years of age. It also conducts a high school mail match in the spring of each year for teams and individuals.

There are several rounds that are easily adapted to school facilities, including the PAA indoor round and the instructional rounds used by the AAHPER Outdoor Education Project in workshops and clinics (see p. 29). The Outdoor Education Project has also conducted postal archery tournaments for four-member male, female, or coed team entries, with four categories by grade level. The two postal rounds used are outlined below.

*AAHPER Outdoor Education Project Amateur Postal Archery Round*  
(designed to be shot indoors)

Distance: 20 yards

Target: 20-inch, blue AIAA face

Total arrows: 60 (5 arrows per end; 4 ends per game; 3 games per round)

Score: 5-4-3-2-1

Total points: 300 per team member; 1,200 per team.

**AAHPER Outdoor Education Project Amateur Outdoor Postal  
Archery Round**

**Target: 36-inch NAA face**

**Score: 9-7-5-3-1**

***Teams in the “Beyond High School” category***

**30 arrows from 40 yards, 30 yards, and 20 yards respectively  
(6 arrows per end; 5 ends from each distance.) Total points:  
810 per team member; 3,240 per team**

***Teams in categories through Grade 12***

**24 arrows from 30 yards, 25 yards, and 20 yards respectively  
(6 arrows per end; 4 ends from each distance). Total points:  
648 per team member; 2,592 per team.**



# glossary

**Anchor point:** The particular spot on the archer's face to which the index finger comes on the draw to give consistency to shooting.

**Arm guard:** A piece of leather or plastic that is worn on the inside of the forearm to protect the arm from the bowstring.

**Arrow plate:** A substance on the side of the bow to give point contact with the arrow.

**Arrow rest:** An extraneous device on the bow to provide point contact; also a resting point.

**Back:** The side of the bow that is away from the shooter.

**Blunt:** A blunt-tipped arrow, often used for small game.

**Bow arm:** The arm that holds the bow (not the string).

**Bow sight:** A device attached to the bow that allows the shooter to sight directly on the target (which cannot be done with the arrow tip except at point-blank range).

**Bowstring:** The string of a bow, usually made of dacron.

**Broadhead:** An arrow with a sharpened metal tip for hunting live game.

**Butt:** A backstop for holding arrows shot at a target.

**Cant:** The act of holding the bow tilted or slightly turned while shooting.

**Cast:** The distance a bow can shoot an arrow.

**Cock feather:** The arrow feather at right angles to the nock; often of a different color than the other feathers.

**Creeping:** Letting the string hand edge forward before release.

**Crest:** Paint or decoration on the arrow shaft near the feathers.

**Draw:** The acting of pulling the bowstring back into the anchor position.

**Drawing arm:** The arm that draws back the bowstring.

**Drift:** Natural deflection of an arrow from its normal path due to outside factors, such as wind.

**End:** A specified number of arrows shot at one time (or from one position) before retrieving.

**End loop:** The part of the string that fits over the bow nock.

**Face:** The part of the bow facing the shooter; also, a target face.

**Fast:** An expression used to warn people of arrows being shot.

**Field archery:** A competitive round shot at various distances and laid out like a golf course.

**Field arrow:** An arrow with a field point, used outdoors for field archery, stump shooting, roving, and small game.

**Finger tab:** A tab worn on the drawing hand to protect the fingers and give a smooth release of the bowstring.

**Fletching:** The feathers of the arrow which give guidance to the arrow's flight.

**Flight:** A competitive round of shooting for distance; also, the path of an arrow.

**Free style:** Shooting with the aid of a bow sight.

**Glove:** A covering worn to protect the fingers from the string.

**Grip:** The handle of the bow, held by the archer when shooting.

**Handle riser:** The center part of the bow.

**Head:** The tip or point of the arrow.

**Hen feathers:** The two feathers not at right angles to the nock; usually the same color (but different from the cock feather).

**Hold:** The act of gripping the bow; hesitating at full draw.

**Index:** The raised piece of plastic on the nock of an arrow that is in line with the cock feather.

**Instinctive shooting:** Aiming and shooting arrows instinctively rather than using the pre-gap or point-of-aim methods or a bow sight.

**Jerking:** Letting the drawing hand jerk too far back as the arrow is released.

**Kick:** The recoil of the bowstring and bow after the arrow is released.

**Laminate:** A composite bow, usually of wood and fiberglass.

**Limbs:** The two ends of a bow, from the handle riser out.

**Longbow:** A bow with no recurve.

**Nock:** The groove in the end of the arrow in which the bowstring fits; also, the groove at each end of the bow which holds the bowstring in place.

**Nock locator:** The material on the bowstring used to indicate the exact nocking point for the arrow.

**Nocking point:** The marked place on the bowstring where the arrow nock is placed before drawing and releasing.

**Overbowed:** Using a bow that is too heavy for the individual.

**Overdraw:** Drawing the arrow back too far so that the tip passes the face of the bow; dangerous practice.

**Point:** The tip on the end of the arrow.

**Point blank range:** The only distance from the target at which the point-of-aim is right on the target center.

**Point-of-aim:** A method of aiming using a point, usually in front of the target, with which the point of the arrow is aligned; allows for trajectory of the arrow.

**Pre-gap (Pre-draw gap):** A method of aiming.

**Quiver:** A container to hold arrows; can be ground, back, side, or pocket type.

**Recurve:** A bow that is curved on the ends.

**Reflexed bow:** A bow with limb ends curving toward the back rather than toward the face of the bow.

**Release:** The act of letting the bowstring slip off the fingertips.

**Roving:** A game played by two or more in the out-of-doors in which natural targets (stumps, trees, bushes) are selected for accuracy competition.

**Self arrow:** An arrow made entirely of one piece of wood.

**Self bow:** A bow made entirely of one piece of wood as opposed to bows such as laminates.

**Serving:** The thread wrapped about the bowstring to prevent fraying of the string.

**Shaft:** The middle of an arrow; an unfletched arrow.

**Shelf:** The place on the bow where the arrow rests.

**Sinking:** The gradual loss of a bow's power.

**Solid bow:** A common reference to a bow that is made entirely of fiberglass or plastics.

**Stance:** A standing position assumed in shooting an arrow.

**String:** Preparing a bow for shooting; also, the bowstring.

**String fingers:** The three fingers used to draw back the bowstring.

**String height:** The distance between the bow and the bowstring at the handle. (Formerly, "fistmele"—a clenched fist with the thumb raised—was the approximate unit of measure for the correct distance.)

**Strung bow:** A bow that is ready to shoot.

**Target archery:** A competitive round shot at fixed distances in an open area.

**Target arrow:** A lightweight arrow with a target point.

**Throwing:** Moving the bow hand to the left upon release.

**Understrung:** A bow with a bowstring that is too long.

**Vane:** A plastic fletching on an arrow.

**Weight:** The amount of effort (in pounds) required to draw the bow a given length (normally measured at 28 inches).

**Weight in hand:** The actual weight of the bow.

**Windage:** The amount of drift in the flight of an arrow caused by wind.

**Wobble:** The erratic motion of a flying arrow.

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- Archery World*. 534 N. Broadway, Milwaukee, Wis. 53202. Monthly. Official publication of the National Archery Association.
- Bow and Arrow*. Gallant Publishing Co., 116 E. Badillo, Covina, Calif. 91722. Bimonthly.

## **Films**

- Archery*. Set of 4 color Super-8 cartridge film-loops. Ealing Films, 2225 Massachusetts Ave., Cambridge, Mass. 02140. The sets cover the Basic skills; Nock, anchor, and release; Aiming (pre-gap method); and Aiming (sight method).
- Archery Today*. 16 mm., sound, color, 22 min. Rental from Grayling Film Service, Route One, Grayling, Mich. 49738 (\$10). The film deals with hunting safety.
- Men's Archery and Women's Archery*. Set of 3 Super-8 loop films. The Athletic Institute, 705 Merchandise Mart, Chicago, Ill. 60654. Each set includes Stance — nocking the arrow; Draw, aim, and hold; and Release and follow through.
- Outdoor Education*. 16 mm., sound, color, 28½ min. Purchase or rental from NEA Sound Studios, 1201 16th St., N.W., Washington, D.C. 20036. A portion of the film is devoted to archery as part of an outdoor education program.

### **Archery Organizations**

The American Archery Council (618 Chalmers, Flint, Mich. 48503) is a coordinating council with representation from the national archery organizations, including:

American Indoor Archery Association (AIAA)  
P. O. Box 174  
Grayling, Michigan 49738

Archery Lane Operators Association (ALOA)  
729 Frederick Road  
Baltimore, Maryland 21228

Archery Manufacturers Organization (AMO)  
618 Chalmers  
Flint, Michigan 48503

National Archery Association of the U.S.A. (NAA)  
Box 48  
Ronks, Pennsylvania 17572

National Field Archery Association of the U.S.A. (NFAA)  
Route 2, Box 514  
Redlands, California 92373

Professional Archers Association (PAA)  
1500 N. Chatsworth Street  
St. Paul, Minnesota 55117

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### **Archery Skills Test Manual for Boys and Girls**

**also available  
from AAHPER:**

One of a series of seven manuals designed to improve teaching and evaluation of sports skills. Contains a series of skills tests with national norms for boys and girls, ages 10-18. Complete instructions for administering the tests and suggestions for their use as instructional aids are given. Also available: class composite records, personal data and profile forms, and squad score sheets.

### **DGWS Archery-Golf Guide**

A guide containing official rules for the sports and for officiating, as well as articles of interest to players and teachers.

### **DGWS Archery Technique Charts**

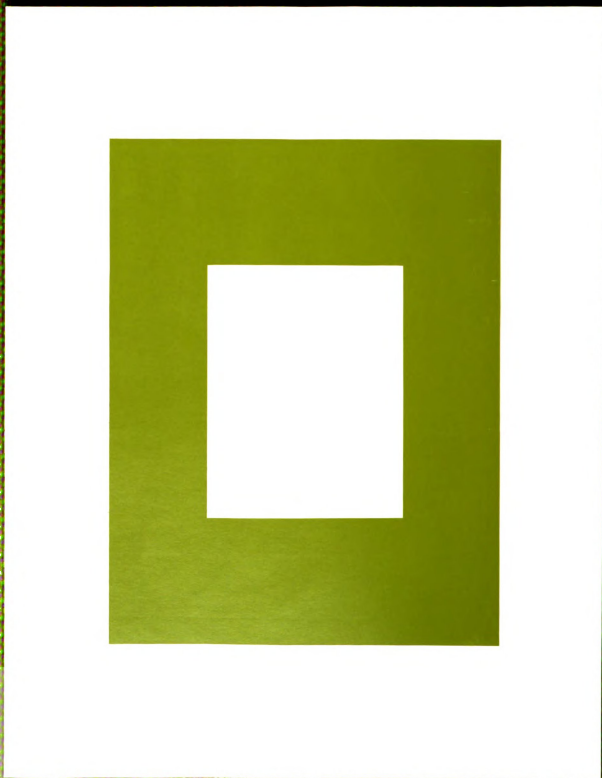
Bulletin board posters illustrating basic techniques. Includes 12 charts, title strip, and references.

available from:

AAHPER Promotion Unit  
1201 16th St., N.W.  
Washington, D.C. 20036

### **DGWS Selected Archery Articles**

A collection of the most popular and useful articles from *DGWS Guides* during the period 1948-1970, and the *Journal of Health, Physical Education, Recreation*. First edition, 1971.



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