FM 21-6

DEPARTMENT OF THE ARMY FIELD MANUAL

TECHNIQUES OF MILITARY INSTRUCTION

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HEADQUARTERS
DEPARTMENT OF THE ARMY
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TECHNIQUES OF MILITARY INSTRUCTION

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CHAPTER 1

INTRODUCTION

1. Purpose

a. This manual, designed to assist Army instructors, presents specific methods and techniques of military instruction that will tend to insure successful teaching. All officers and noncommissioned officers must know how to teach. As specialists, they may have an excellent knowledge of some phase of the military profession; but, to teach others, they must also know the best methods and procedures for imparting their knowledge.

b. Users of this manual are encouraged to submit comments or recommendations to improve its effectiveness. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be submitted directly to Commandant, U.S. Army Armor School, Fort Knox, Ky. 40121.

2. Scope

This manual contains principles and techniques both for use in the instruction of Army personnel and for use in the training of instructors. Recommended lesson outlines are included in the appendixes; these will help in presenting the subject matter to which the outline pertains. The illustrations in the manual are suggestions for training aids. These illustrations may be used on an opaque projector, traced on acetate and used with an overhead projector, or enlarged and used as charts.

CHAPTER 2

THE ARMY INSTRUCTOR

3. The Instructor's Role in Training

The combat success of the Army depends on the effectiveness of the instruction that individuals and units receive during training. The success of any plan for training will depend upon the soldier-instructors who present subjects to soldier-students. First-class instruction

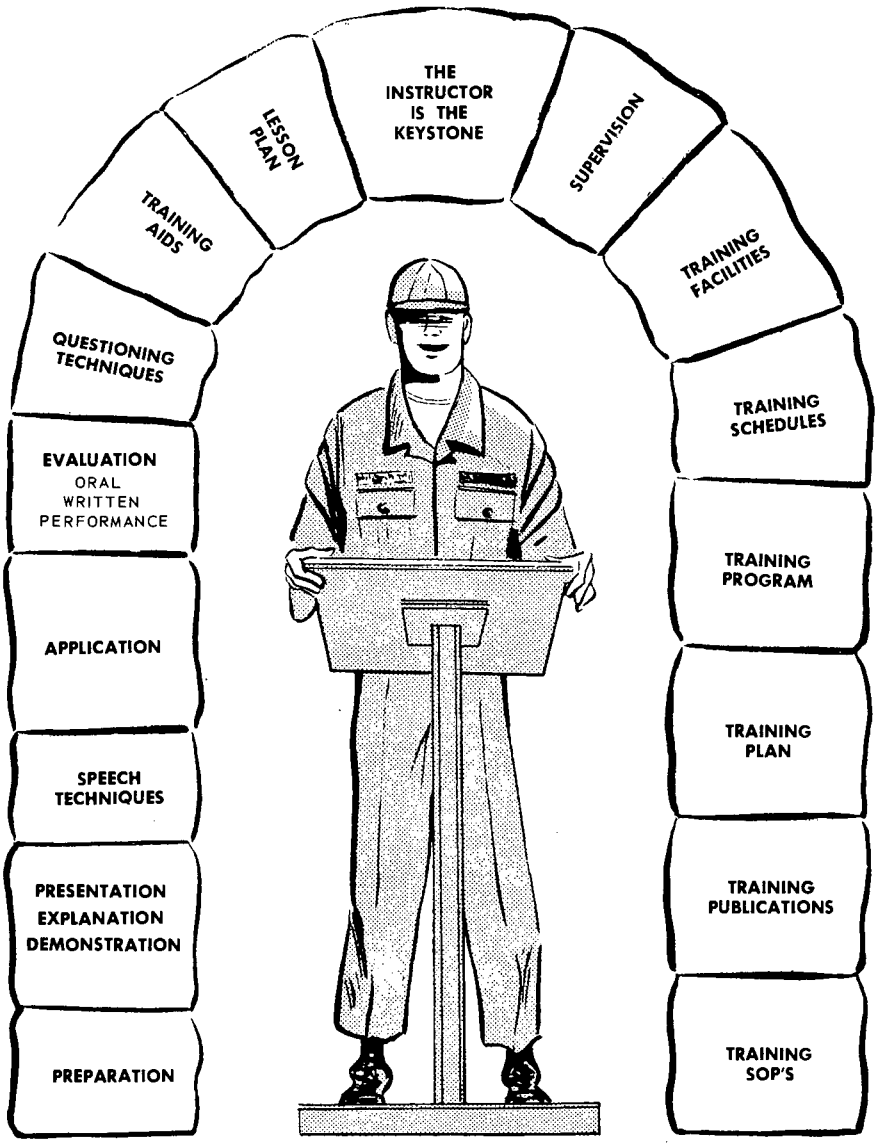


Figure 1. The training arch.

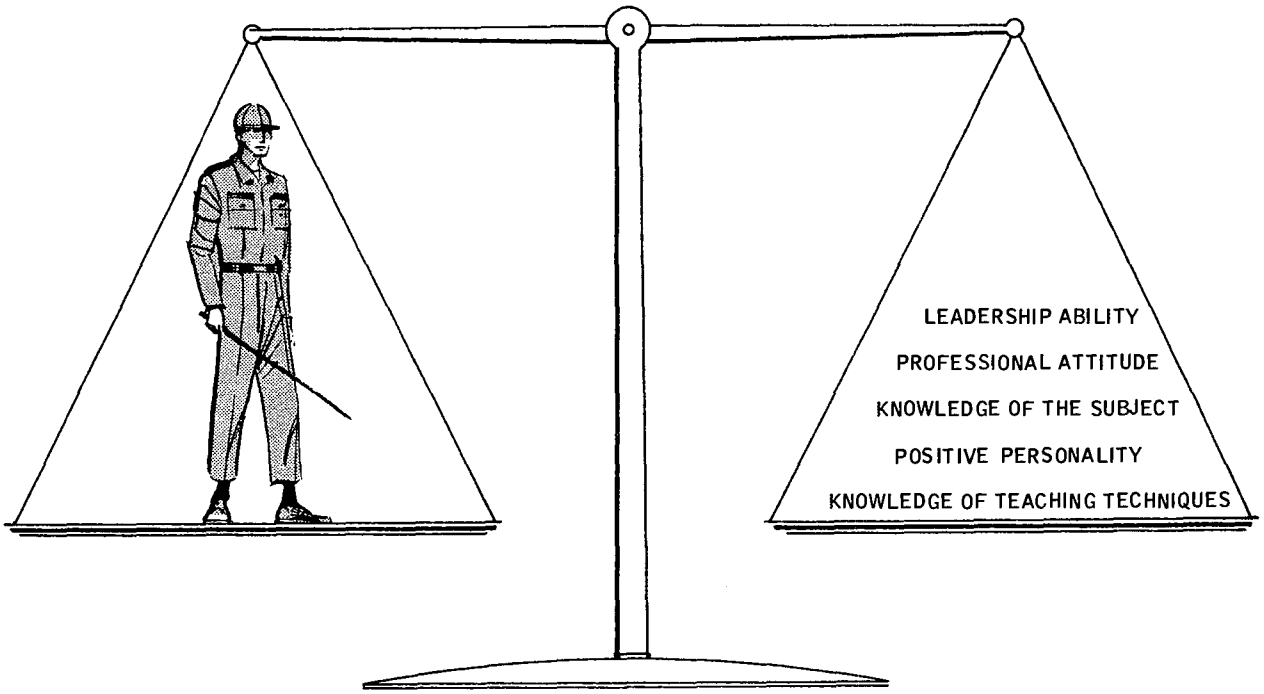


Figure 2. Characteristics of a good instructor.

helps to produce a first-class Army, and first-class instruction is the result of having well-trained instructors—instructors who know their subjects thoroughly and know how to present their subjects to others. The instructor is the keystone in the training arch (fig. 1).

4. Characteristics of A Good Instructor

An instructor should possess the following characteristics (fig. 2):

a. Knowledge of the Subject. It is obvious that the instructor must know his subject if he is to teach it to others. As far as possible, instructors should have both field experience and a thorough knowledge of applicable training literature. An instructor will make a serious mistake if he assumes that field experience alone will give him sufficient knowledge to teach, without further preparation and continuous study of training literature. Field experience should enable him to evaluate the material in training manuals and to present it in a manner that will be realistic to students. He should know more about his subject than he will have time to teach and, certainly, should be prepared to answer virtually any question on the subject.

b. Knowledge of Teaching Techniques. A knowledge of how to instruct is a prerequisite to good instruction and is the reason for conducting instructor training courses in the Army. The instructor must be able to apply the principles, methods, and techniques of instruction that are discussed in this manual.

c. Positive Personality. Personality can be defined as the sum total of all of those things about an individual to which other people respond, either favorably or unfavorably. A good personality—one that gets a favorable response—is not some mysterious inborn quality. It can be developed by concentrating upon and improving specific features of the personality. Each instructor should strive to develop in himself those characteristics that contribute to successful teaching, such as enthusiasm and sincerity, and to avoid those characteristics that interfere with effective instruction, such as superiority and indifference.

d. Leadership Ability.

(1) Instructors who are good leaders can develop proper habits, attitudes, appreciations and character traits in their students as well as teach the basic information required in a course. They see that discipline is maintained

and that students conduct themselves as soldiers at all times. They maintain control of their classes and see that the classes run smoothly.

(2) Course management is an important responsibility of leadership. This management includes detailed planning of the course, obtaining and distributing supplies and equipment, keeping records, reducing waste, adjusting the program to the needs of students, making reports, and accomplishing a number of other administrative details that are necessary for effective teaching. Courses must be managed if they are to be taught effectively.

e. Professional Attitude.

(1) The instructor who has the proper professional attitude continually adds to his storage of knowledge and skills in his subject and makes every effort to improve his teaching ability. He must also have a sympathetic understanding of his students' problems and be fair in dealing with each individual.

(2) Everything an instructor says and does during classes, as well as the manner in which he says and does things, reflects his attitude toward his students, his subject, and the training program. His attitudes have a tremendous influence upon student attitudes and morale, for students tend to adopt both the attitude of the instructor and his point of view toward the the subject and the training.

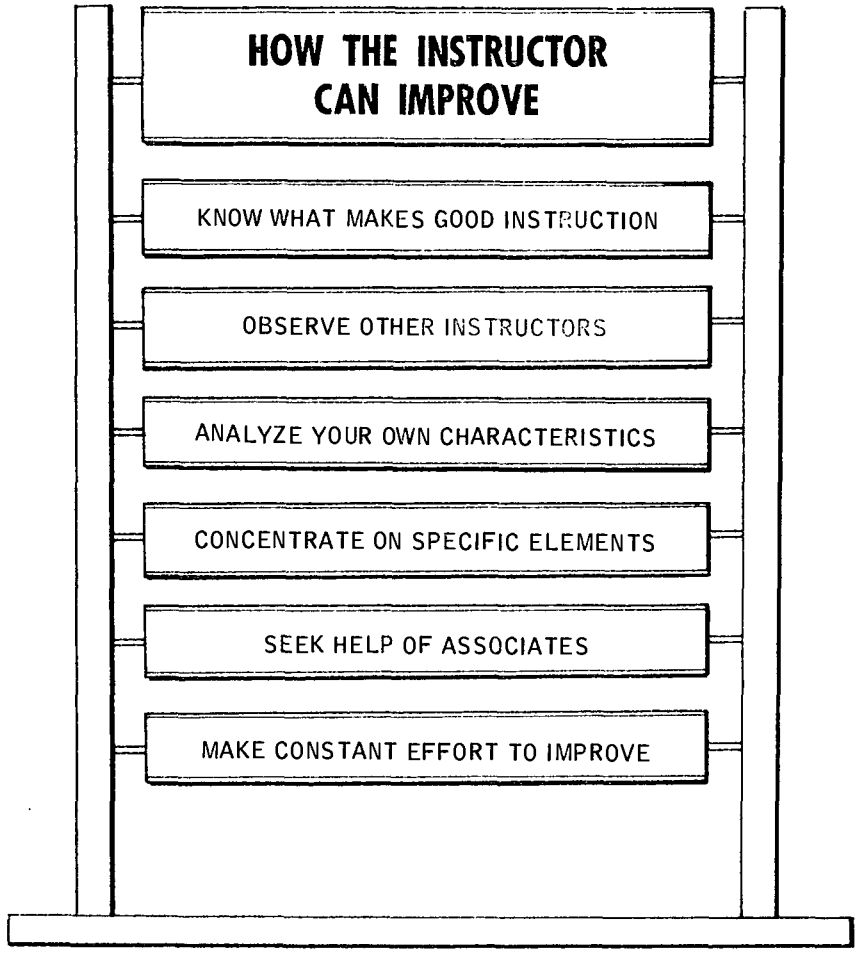


Figure 3. Instructor improvement.

5. Instructor Improvement

An instructor can improve himself only by constant effort (fig. 3). The fact that an instructor has taught for some time does not mean that he has made significant improvement, nor does the fact that an instructor is rated superior this year mean that he will be superior next year.

a. Know What Makes Good Instruction. In his efforts to improve, the instructor must start with an appreciation of the basic elements of good instruction. He must set certain standards for himself.

b. Observe Other Instructors. The instructor must maintain his own individuality while improving his technique. He should observe other instructors for the purpose of learning from them, but should not imitate even the most capable ones to too great an extent. Two highly competent instructors may have radically different personalities and use entirely different techniques, yet both do a superior job of teaching. Instructors should determine what they can do well and then develop techniques based on their known abilities rather than on abilities that they admire but lack.

c. Analyze Your Own Characteristics. Self-evaluation and self-analysis are essential to improvement. The instructor should constantly attempt to evaluate his own teaching and analyze his own characteristics to find out just what his strengths and weaknesses are. He should discover strengths and build upon them; discover weaknesses and correct them.

d. Concentrate on Specific Elements. Progress is made by concentrating upon specific techniques and working out a systematic plan for their improvement. A general attitude on the part of an instructor to do well, while commendable, rarely brings the significant improvement desired; attention must be given to improving specific aspects of instruction.

e. Seek Help of Associates. An instructor cannot always evaluate his own work objectively. He should encourage others to criticize his instruction and should welcome their suggestions. Other instructors, assistant instructors, and supervisors can identify an instructor's strengths and weaknesses more readily than can the instructor himself.

f. Make Constant Effort to Improve. The instructor's attitude toward his work is best judged by the effort he makes to improve. After each lesson, the good instructor will ask himself how he could have done the job better. He will not be satisfied with anything but the best. Constant alertness in seeking the best methods to improve his students' learning is the most important single ingredient in the instructor's recipe for improvement.

6. Developing Good Relationship with Students

To be successful, instructors must have the respect of their students. Instructors gain the respect of their students by displaying correct attitudes toward them. The respected instructor displays interest that is sincere and objective. He respects the personality of each student, regardless of racial, geographical, or intellectual grouping. He guards against over familiarity with his students. And, finally, he is firm and frank when it is in the best interest of the student and the Army. An excellent way of developing the proper attitude toward students is to think of them as possessing the following characteristics (fig. 4):

a. With a few exceptions, they are mentally, emotionally, and physically mature.

b. They have a serious purpose and are eager to get the most from their training.

c. They are keenly interested in the practical applications of theory and knowledge. They judge instructions in terms of their needs and the demands of their jobs. They are interested in the *why* and *how* of what they are asked to do.

d. They are quick to appreciate and respect instructors who know their subject and who have the ability to present effective instruction. They are equally quick to detect the incompetent.

e. Men vary in their physical characteristics, intelligence, general education, past experience, determination or desire to achieve, and emotional stability. Instructors must be aware of

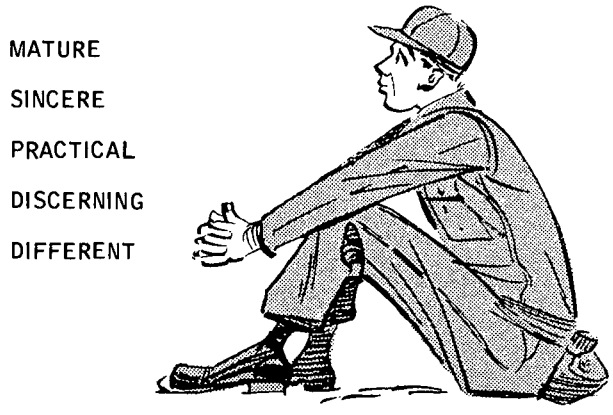


Figure 4. Student characteristics.

these differences and take them into consideration. However, most men are capable of mastering the essentials of military training if they are well taught.

7. Advice to Instructors

The instructor must follow certain rules of conduct (fig. 5):

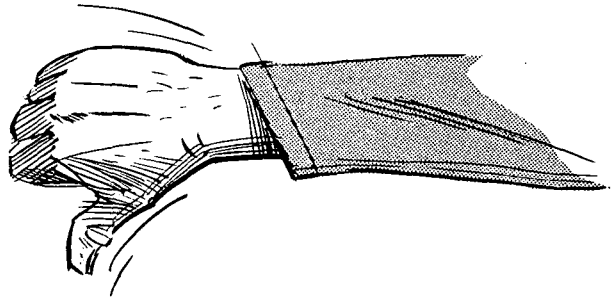
a. Do not bluff to cover lack of knowledge. An instructor must know his subject thoroughly, but even then, questions may arise that he cannot answer. If he does not know the answer, he should admit it, find the correct answer, and give it to the class as soon as practicable.

b. Do not use profanity or obscenity. When the instructor does, he loses dignity and class respect.

c. Do not use sarcasm or ridicule. Since students are helpless to retort, they become resentful. When an individual is resentful, his mind is closed to learning.

d. Do not talk down to a class. The instructor should make the class feel that he considers himself fortunate to have acquired the experience and knowledge that he wishes to share with fellow members of his profession.

e. Do not lose patience. Slowness or apparent inability to learn may mean that the instructor will have to use other methods and techniques.



1. DO NOT BLUFF.
2. DO NOT USE PROFANITY OR OBSCENITY.
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5. DO NOT LOSE PATIENCE.

Figure 5. Advice to instructors.

CHAPTER 3

PRINCIPLES OF INSTRUCTION

8. General

An instructor who has only a few vague ideas about learning will likely meet with limited success. To achieve maximum effectiveness an instructor must be familiar with the nature of learning, the basic instruction process, and the general principles or guides for creating an effective teaching-learning situation.

9. The Nature of Learning

The desired outcome of all instruction is student learning. If students are no better equipped to do something at the end of a lesson than they were before, no learning has resulted from the instruction. The instructor must accept responsibility for his students' learning and if learning for which he is responsible does not take place, he should look first to himself and his presentation for the cause.

a. Learning—an Active Process. Learning can be defined as the process of acquiring new knowledge, skills, techniques, and appreciations that will enable the individual to do something that he could not do before. Notice the emphasis is placed upon doing. Learning is essentially an active process; it is not passive absorption. Students must be given purposeful, worthwhile work to do; they must be kept active both mentally and physically.

b. Learning Through the Senses. Learning can also be defined as the change that takes place in the individual as a result of his mental and physical responses to stimuli. The five senses are the channels through which the individual is stimulated; through the senses of sight, hearing, touch, taste, and smell he makes contact with things about him. As a result of these contacts, he makes responses that lead to the acquiring of new knowledge, skills, or attitudes. It is the instructor's responsibility to provide learning situations that make maximum use of the senses and produce the desired responses. Lessons should appeal to a variety of senses. This is one reason why practical exercises, training aids, and demonstrations are valuable.

c. Types of Learning. The products of student learning may be divided into three types: knowledges, skills, and attitudes. Knowledges or understandings are often designated as awareness of facts, principles, meanings, concepts, and relationships. Skills refer to physical and mental abilities such as specific habits, manipulations, and adjustments. Mental skills or abilities include problem solving, critical thinking, analysis, synthesis, and judgment. Attitudes include appreciations, ideals, preferences, and values.

10. The Instructional Process

The instructional process (fig. 6) is the basic procedure for teaching a single lesson objective or an entire phase of a subject. It is a three-stage process of presentation by the instructor, application by the student, and evaluation by the instructor. Within this framework the instructor applies specific instructional methods and techniques for achieving the most effective teaching-learning situation.

a. Presentation. The student gains the concept of the subject—by completing a study assignment, by listening to an explanation, by participating in a conference, or by watching a demonstration. For most military subjects, effective presentation will consist of a combination of these activities: study by the student, and telling and showing by the instructor.

b. Application. The student is given an opportunity to apply the new concepts gained in

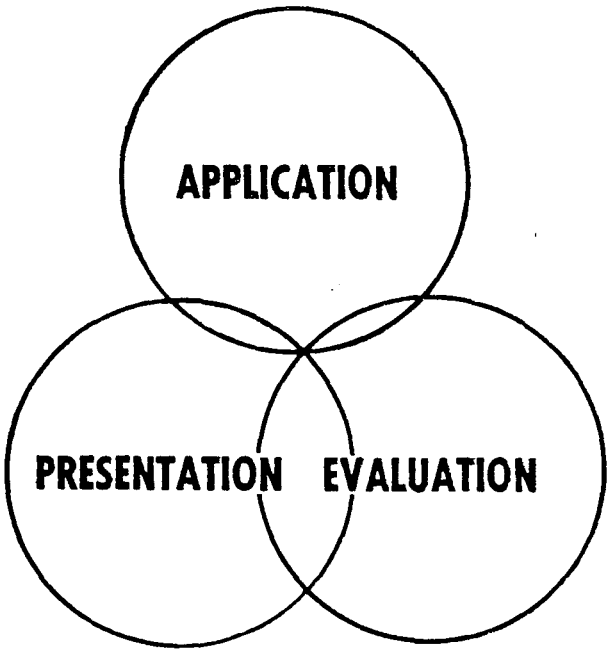

Figure 6. The instructional process.

the presentation stage. The application stage is the most important. All learning requires conscious and successful response by the student. In planning and conducting instruction, the instructor should remember that *it is not so much what the instructor does or says that teaches, but rather what he causes his students to do.*

c. Evaluation. The instructor checks student responses to keep them informed of their progress and to prevent them from practicing incorrect responses. Evaluation includes formal testing at the end of a period or phase of instruction; however, the most important type of evaluation is informal and is concurrent with the presentation and application stages of the instructional process. Such evaluation is accomplished by oral questions to the class following the explanation or demonstration of a teaching point, by close observation of students during practical work to detect errors and make on-the-spot corrections, and by checking student understanding of previous related instruction.

11. Principles of Instruction

The principles of instruction describe conditions and requirements for effective teaching and, thus, effective learning (fig. 7). They

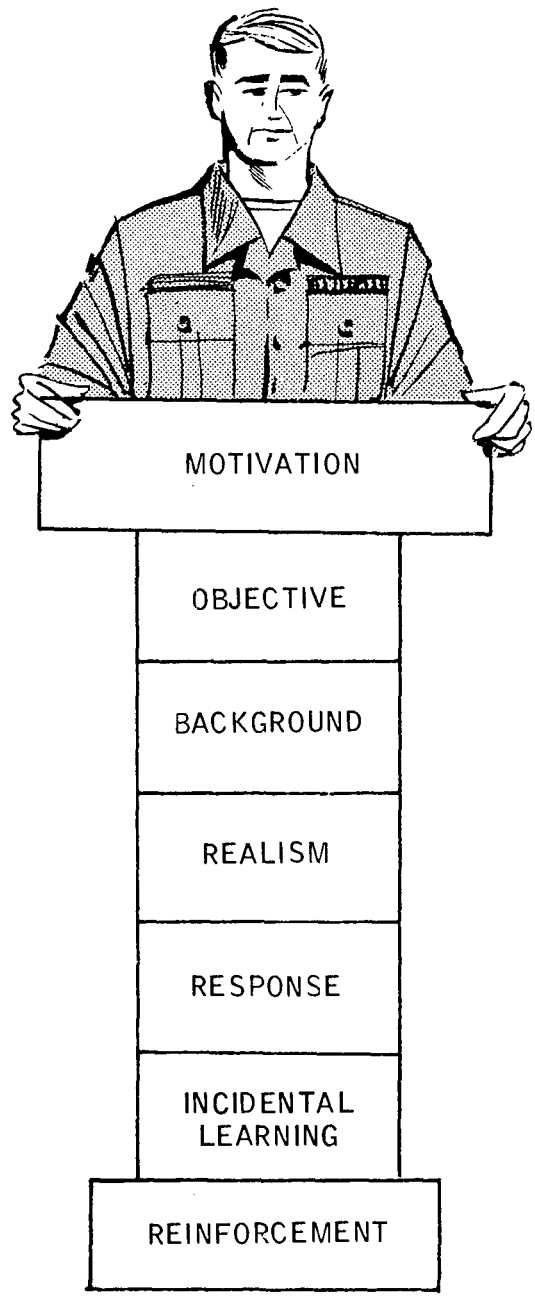

Figure 7. The principles of instruction.

should guide the instructor in using the *instructional process* and in selecting and using specific methods and techniques of instruction. These principles are—

a. Motivation. The student must want to learn before he can be taught (fig. 8). To develop in the student the desire to learn and to sustain this desire so that he will pay attention

Figure 8. Motivation.

to the presentation and try to follow directions in the practical work is a major requirement for effective instruction. The following are some of the techniques (fig. 9) that instructors can use to motivate students:

(1) *Show a need.* It cannot be assumed that men will recognize the importance of learning the lessons presented in a training program. Many important things may seem unrelated to the work of the soldier when he first hears of them. Instruction must include valid reasons for learning and an explanation of how the things taught will be used.

(2) *Develop an intent to learn.* Before instruction is presented, the student must be made to realize that he is responsible for learning. It is not enough that the student is physically present for training; he must be mentally prepared to learn. The instructor must check class progress frequently and insist that each man apply himself. A student learns more when he is made to feel responsible for learning.

(3) *Maintain interest.* Interest is essential if attention is to be gained and held. The use of personal force and enthusiasm, examples, and illustrations will help keep interest high. The more interesting the material can be made for students, the more readily they will learn it. The instructor, however, must keep in mind that his responsibility is to teach, not to entertain.

(4) *Encourage early success.* Early success motivates students. An individual's success tends to drive him to further effort and additional successes. For the normal person, achievement brings a certain amount of pleasure and satisfaction, and stimulation toward greater activity. During the early stages of a training program, instructors should have students work at an activity that they can complete successfully.

(5) *Give recognition and credit.* These provide strong incentives for learning. Students desire, and have a right to expect, credit for work well-done. Instructors must mention the good points of students' work and not dwell entirely on their mistakes. Start with favorable comments; then lead into suggestions for improvement.

(6) *Feelings and emotional responses.* Avoid feelings and emotional responses that interfere with efficient learning. Feelings affect learning. Students who are angry, resentful, embarrassed, frightened, or otherwise emotionally upset think about the source of their disturbance rather than the subject being taught.

(7) *Use competition.* Friendly competition stimulates learning. Such competition between two or more groups or teams normally achieves efficient learning if the intensity of the competion does not obscure learning goals. When possible group competition is preferable to one individual soldier against another. Having a student compete against his own, past record provides effective competition.

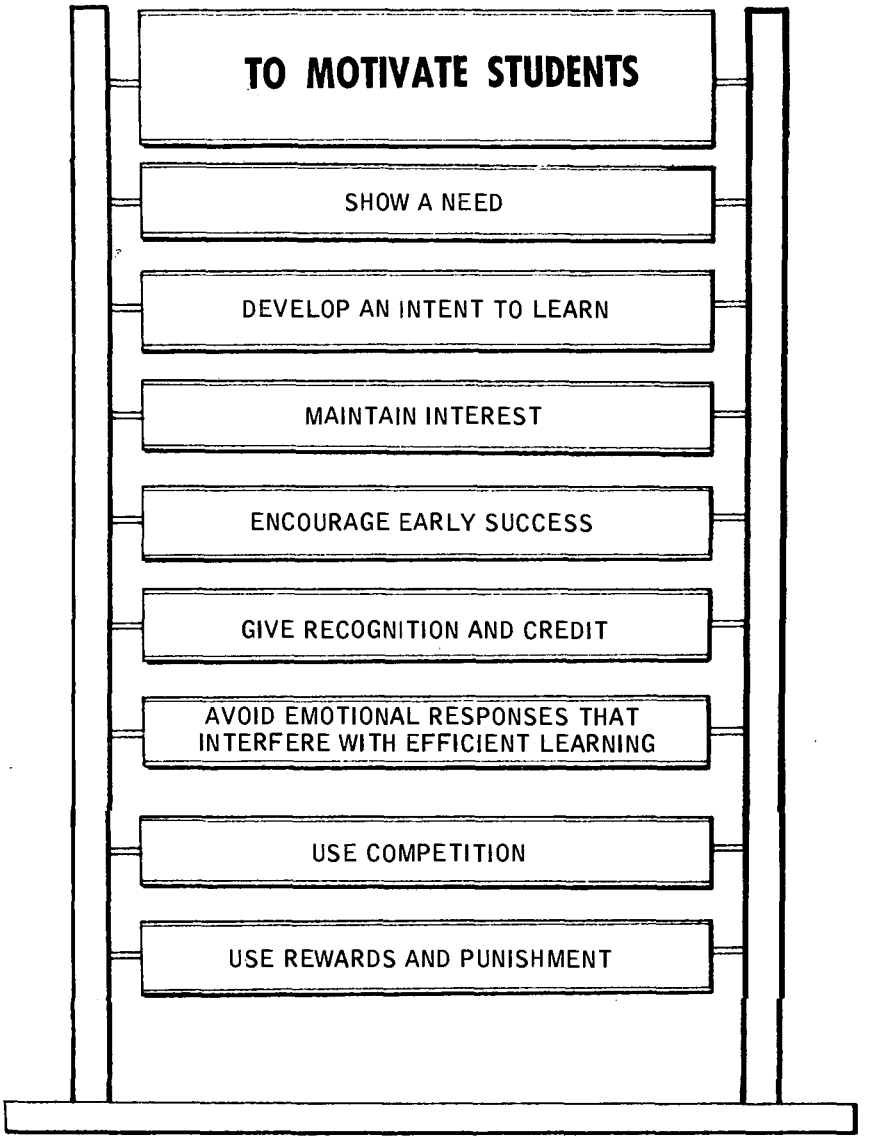

Figure 9. Techniques of motivation.

(8) *Use rewards and punishment.* Rewards are powerful incentives. On the other hand, punishment is perhaps the least desirable form of motivation. The imposition of punishment that the students consider to be unjust or too severe may breed resentment, antagonism, and failure to learn the subject with which punishment is associated.

b. Objective. Learning is more efficient when the student knows exactly what he is to learn and what is expected of him (fig. 10 and para 14 and 61). At the beginning of each period of instruction, instructors should set forth the goals that the student is to achieve—exactly what the student should be able to do and how well he should be able to do it as a result of the instruction. Further, the student should be told how each lesson fits into the overall program of instruction and how the course of instruction prepares him for his job.

c. Response. A student learns only what he does or responds to (fig. 11). This may take

Figure 10. Objective.

many forms—listening, observing, reading, recalling, taking notes, reciting, writing, practicing, or solving problems. The instructional process of presentation-application-evaluation centers on the instructor's applying this principle of instruction. Every period of instruction should be planned to require the student to respond frequently in a form than can be observed and evaluated by the instructor. "Practice makes perfect" only when the student practices correctly.

d. Reinforcement. Efficient learning requires that the student know whether his responses are right or wrong (fig. 12). Application of this principle as the heart of the *evaluation* stage of instruction is well-established in the psychology of learning. For a student to know that his response is right or successful strengthens the response and tends to "fix it in mind." A student should also be informed of incorrect responses and given an opportunity to correct them. Ideally, the student should know whether he is right or wrong immediately after each response. The longer the delay between response and knowledge of results, the weaker reinforcement becomes. Instruction should be planned so that evaluation is concurrent with the *presentation* and *application* stages of instruction. Immediate on-the-spot correction of errors is essential to effective instruction and efficient learning. Formal examinations at the end of an hour or phase of training will not adequately accomplish the principle of reinforcement because of the delay between response and knowledge of results.

e. Realism. The instructor should insure that learning activities in training relate closely to the situations in actual practice (fig. 13). Each lesson, or main point of a lesson, should be subjected to the test of these questions:

(1) Is this the way this material will be used by the soldier in actual practice? Material presented must be realistic from the standpoint of its field application. However, during the introductory phases of instruction in a subject, the desire for realism should not be allowed to obscure learning. The fact that a soldier in combat may have to consult a map during a snowstorm while under enemy fire does not mean

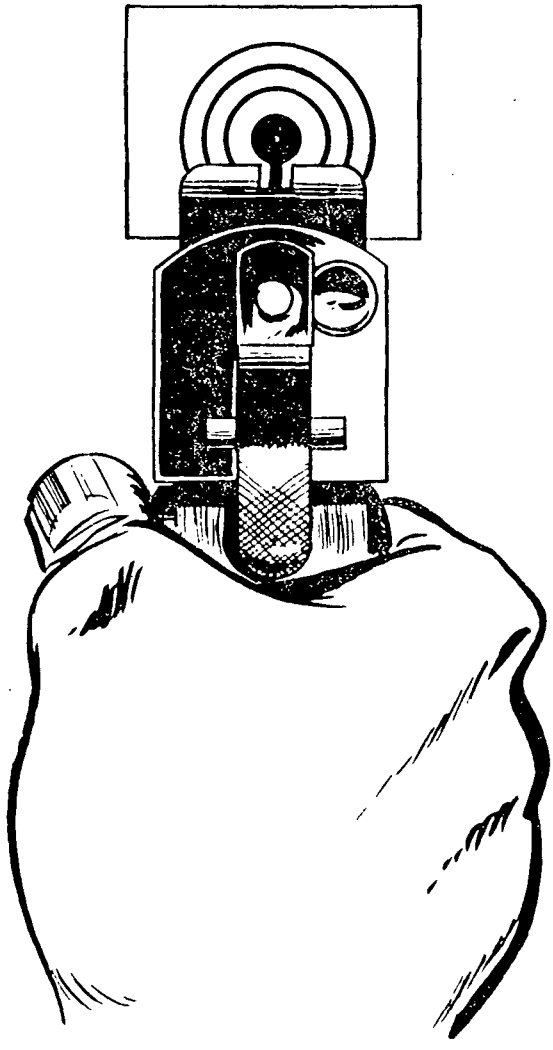

Figure 11. Response.

that preliminary instruction in map reading should be presented under similar conditions. Realistic obstacles should be introduced into practical work *after* a soldier has mastered basic principles and techniques.

(2) Is my presentation realistic as far as the level of the class is concerned? Instruction beyond student comprehension is unrealistic; however, relatively difficult subject matter can be presented to classes of different levels if it is adapted to their specific needs. Make instruction more realistic to the student by using such personal references as "Here's what this means to you," or "You will use this in this way."

f. Background. Learning is based on experience; new experiences are interpreted on the basis of past experience (fig. 14). A person seeing an airplane for the first time may call it a "strange bird" because that describes the new object in the light of things familiar to him.

(1) An Army instructor can explain many new things by using illustrations drawn from the past experience of students and relating these past experiences to the new material. Resistance to the flow of electrical current through various gage wires is likened to the resistance to the flow of water through different diameters of pipes. Describing carburetion as "the atomization of combustible material to facilitate combustion of ingredients" may be entirely correct, but few students will get the full meaning from this explanation.

(2) Past experience of students varies; therefore they may not all attach exactly the same meaning to an explanation. Instructors must select and present illustrations carefully so that all students will get the desired meanings. In early stages of Army training, instructors must draw illustrations from common civilian experiences. As training advances, more and more illustrations can be drawn from earlier phases of the training program.

(3) Instructors apply this principle in the introduction to a lesson by reviewing previous instruction. This helps students to recall what they have learned previously, which makes up their background or past experience for the lessons to be presented.

g. Incidental Learning.

(1) Learning is complete only when the student has acquired the attitudes, values, appreciations, interests, ideals, and habits of conduct that will enable him to apply correctly the things learned (fig. 15). This statement is of such importance in military training

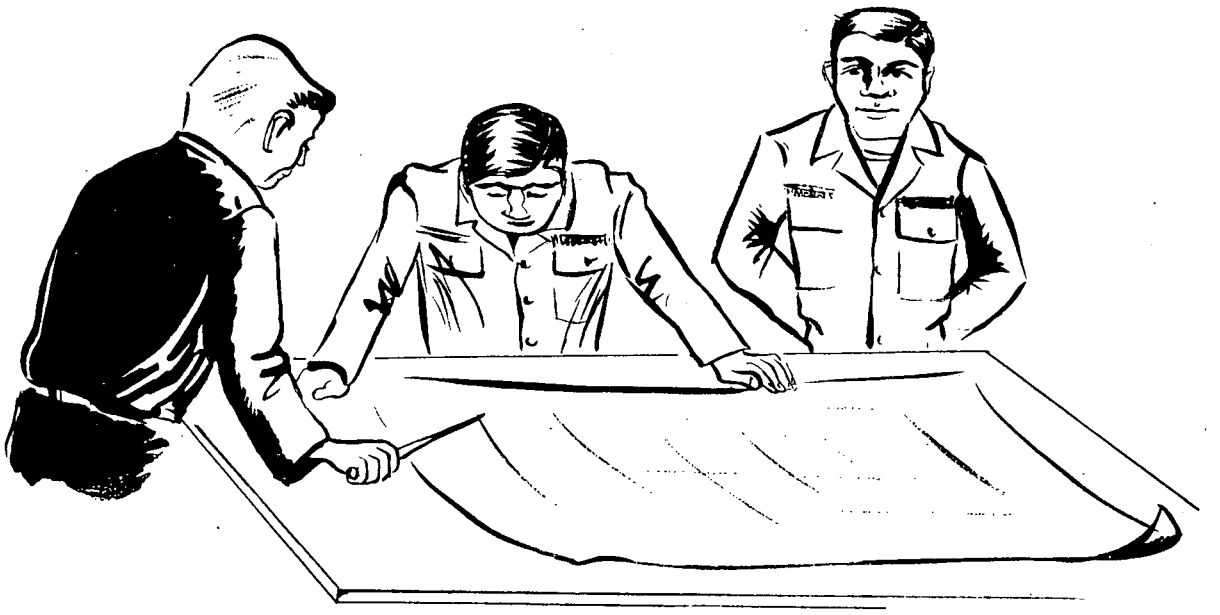

Figure 12. Reinforcement.

MOST INSTRUCTION CAN BE MADE REALISTIC TO THE STUDENT

Figure 13. Realism.

Figure 14. Background.

that it should be considered a fundamental principle for the guidance of instructors. The military instructor must not only concern himself with the teaching of skills and information that contribute directly to his lesson objectives; he must also be alert to the development of correct appreciations and attitudes, which determine how effectively the soldier will apply the knowledge and abilities he has acquired in the training program. This principle emphasizes the fact that the instructor's real, ultimate task is to train men—not merely to teach subject matter.

(2) Many Army training publications recognize the validity of this principle of learning when they call for such training results as aggressiveness, the will to fight, initiative, resourcefulness, and the spirit of the offensive. These desirable ends are not taught directly; they are developed indirectly as a result of three basic factors:

(*a*) Instruction that recognizes that these attributes are the byproducts of good teaching.

(*b*) Leadership that emphasizes and contributes to the ultimate objectives of military training.

(*c*) Carefully designed training programs that provide numerous realistic situations in which these qualities have the opportunity to develop.

(3) To apply this principle in his teaching, the instructor must be alert to every facet of the student's develop-

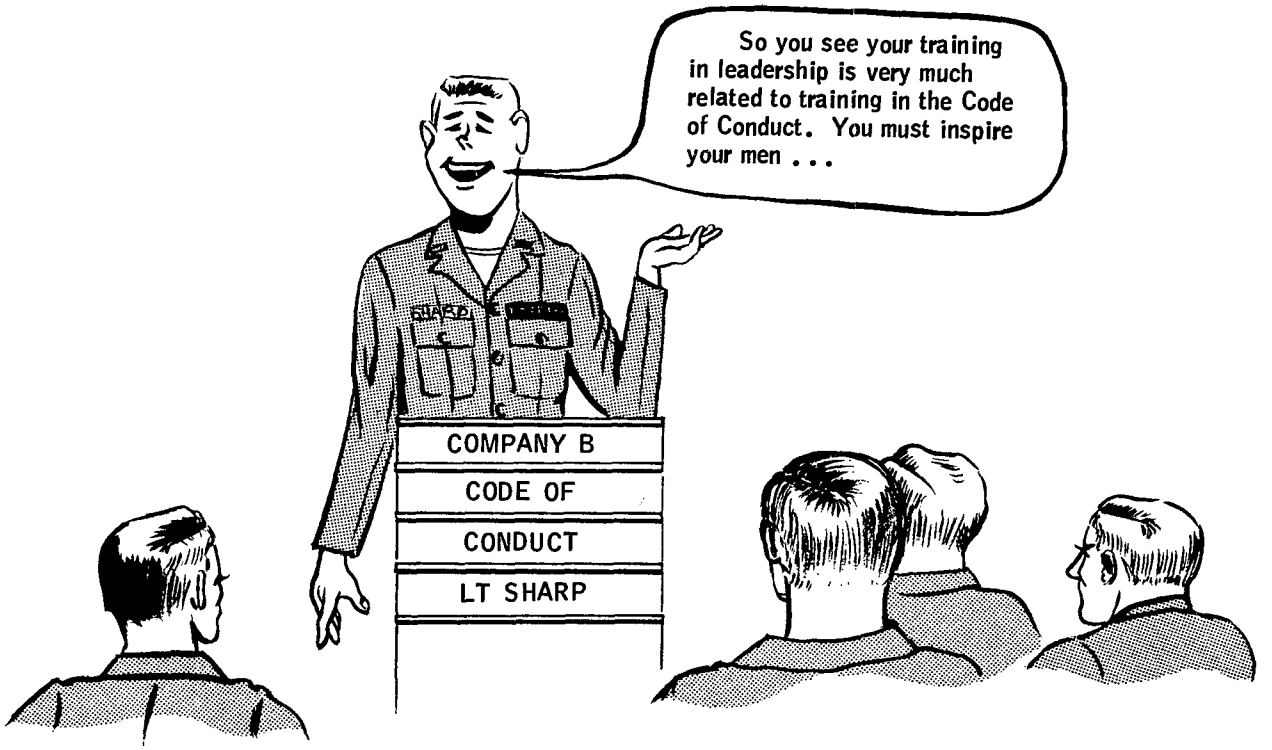

Figure 15. Incidental learning.

ment. He must recognize that his men learn many things from his instruction in addition to the material presented. He must set a good example, and employ a positive attitude toward his instruction. Students are quick to pattern their reactions to the attitude of the instructor. The instructor must refrain from making incidental remarks and voicing personal opinions that do not contribute to the desired student attitude. The instructor should give advance thought to the desirable attitudes, appreciations, interests, ideals, and habits of conduct that may result from instruction, and make every effort to contribute to their development.

CHAPTER 4

PRESENTING ORAL INSTRUCTION

12. General

Effective communication between the instructor and the student is essential. This chapter deals with the organization and presentation of oral units of instruction. The chapter is organized into three parts: the introduction, the explanation, and the summary or review. This is the basic organization for effective oral presentations—in other words: "Tell them what you are going to tell them; tell them, and then tell them what you have told them."

13. The Introduction

By means of the introduction, the instructor sets the stage for his presentation. The introduction will vary in length, depending upon the nature of the subject and the teaching situation. The introduction should (fig. 16): establish contact between the instructor and his class, arouse student interest in the subject and disclose the scope and objectives of the subject.

a. To establish contact, to arouse interest, and obtain attention—use one or more of the following:

(1) Good speech techniques (see para 17–25).
(2) An effective opening statement.
(3) A reference to previous instruction, when applicable, and any reference of special interest to the class.
(4) A startling statement.
(5) Story or example.
(6) Rhetorical question.
(7) Quotation and historical illustration.
(8) Skit or demonstration.

b. To disclose the scope and objectives of the subject, tell the class what they will learn and, therefore, be able to accomplish (objectives), and why the subject is important to them (reasons) (fig. 17).

14. Elements of the Introduction

The objectives of the lesson and the reasons for learning the lesson should always be included in the introduction. Other elements, which may or may not be included, are a review of previous instruction and the proce-

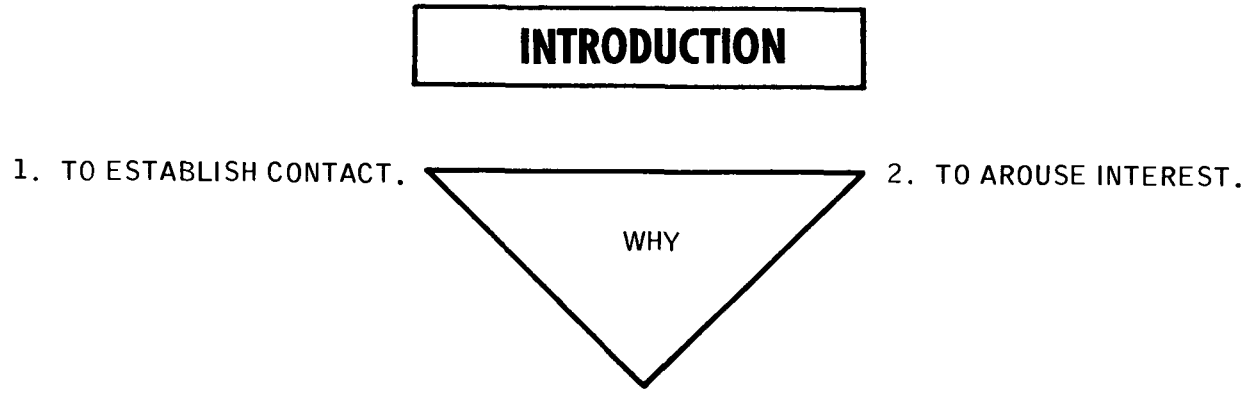

Figure 16. Purpose of the introduction.

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INTRODUCE YOUR LESSON WITH

Figure 17. Introducing the lesson.

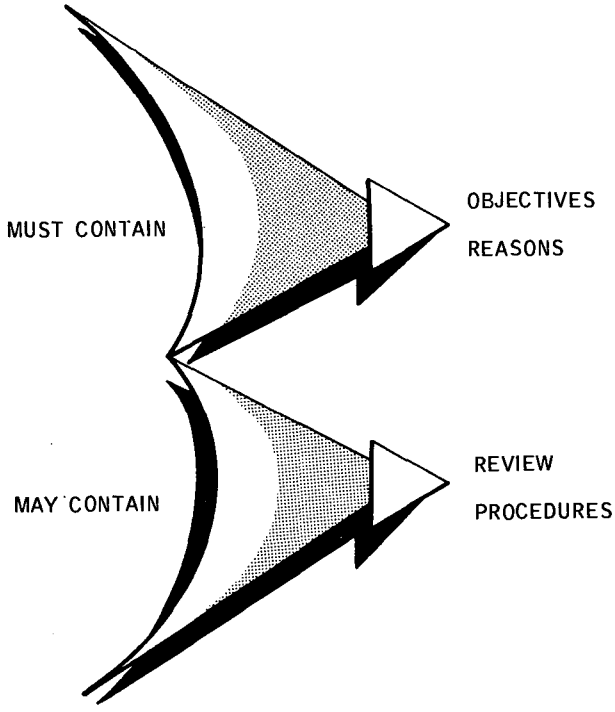

Figure 18. The introduction.

dure to be followed in conducting the lesson. These elements follow no set order, and the instructor should not develop a stereotyped pattern. For each lesson he should have in writing or clearly in his mind what he intends to say in his introduction and then be sure that he has included all the necessary and desirable elements (fig. 18).

a. Objectives of the Lesson. State briefly and clearly what is to be learned. State objectives in terms of what the students will be able to do, the conditions under which they should be able to perform, and the performance standards they must achieve. Students learn best when they have clearly defined goals. Insure that students know when they must memorize a procedure, be able to perform an operation, define terms, identify components, etc. State lesson objectives forcefully and enthusiastically. Never preface your remarks with such statements as, "This is the driest subject in the Army," or "Regulations require that this subject be taught; so bear with me."

b. Reasons for Learning the Lesson. American soldiers like to know the why of things, and every instructor should strive to satisfy that curiosity. If you are to teach something that could be helpful in saving the soldier's life, tell him so. Make your reasons convincing. Makes students feel that it is important for them to learn the lesson. Use real-life examples and illustrations. Relate some personal experience that will drive the point home, or use a real or hypothetical example that will show the value of learning the subject. Whenever possible, stress the battle importance of the lesson.

c. Brief Explanation of the Procedure to be Followed. When students know what is to take place, they will be more attentive. To illustrate: "During the next 2 hours we will follow this procedure. I will explain the steps as my assistant instructor goes through the disassembly and assembly of the weapon. Watch him closely, and disassemble and assemble each part immediately after he does. The assistants will check you as you proceed. When this has been completed, you will disassemble and assemble the weapon at your table under the supervision of the assistants. Enough time is allowed to permit you to do this several times. Practical tests will be conducted during the last 30 minutes so that each of you can see "how well you have learned the lesson."

d. Review of Previous Instruction. In every unit of instruction that is a continuation of previous instruction, the introduction should contain a tie-in or a brief review of the previous instruction. This is one application of the principle of background and serves to recall information the student has already learned as well as to place every member of the class on a common level.

15. The Explanation

In the explanation or body of the oral presentation, instructors actually present their teaching points. Subject matter is explained, understanding is developed, and appreciations are stimulated.

a. Organization of the Explanation. The explanation must be so organized that the students can follow the order of presentation (fig. 19). An organization that is completely understandable to the instructor, or to someone else familiar with the subject, may not be logical for presentation to students acquiring their

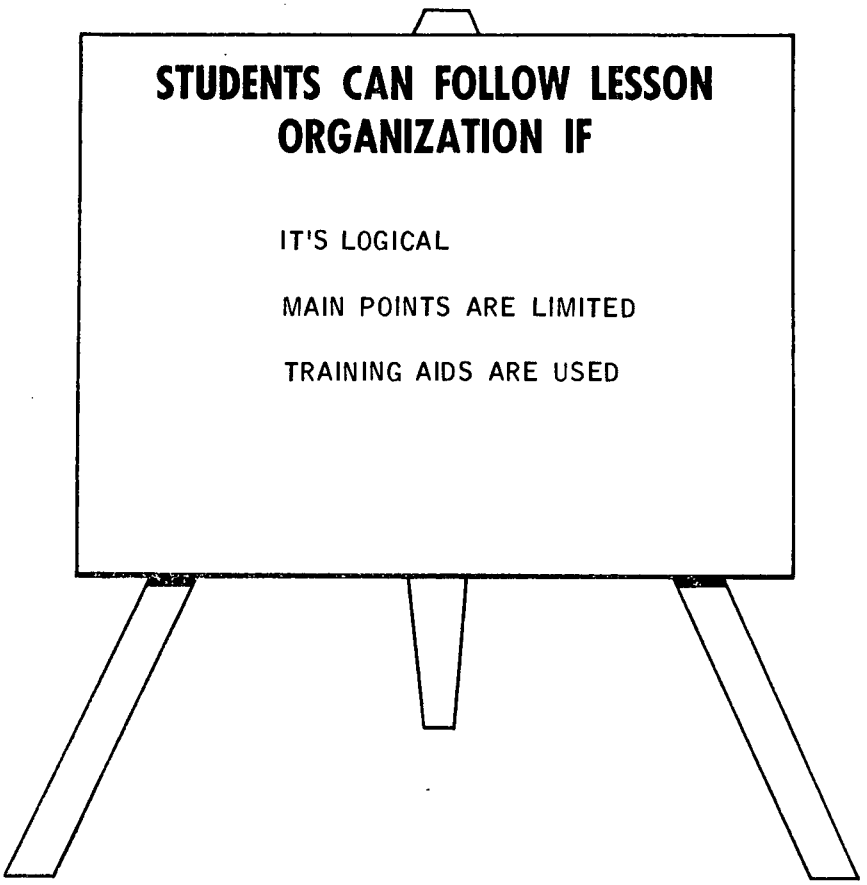

Figure 19. Organization.

first knowledge of the material. Limit the number of main topics discussed. Students can easily remember 2 or 3 main topics, and can remember 4 or 5 with little difficulty, whereas the presentation of 8 or 10 main points may confuse them. Help students follow the organization by using training aids that list or illustrate main points. Decide which material should logically come first and which material should follow. If you are teaching procedure, this is not too great a problem because obviously you must perform step one before you perform step two and three. Some subject matter can be organized around a single progressive situation or example to provide unity to your lesson. The lesson may revolve around the problems faced by Lt X and each time you take up a new problem or portion of this problem you refer to Lt X. It may revolve around a progressive combat situation and each time you take up new material you explain how the combat situation has enlarged to require new action. The teaching vehicle serves to show the relative position of the learning material under consideration within the context of the whole lesson.

b. Transitions Between Points. Getting from point to point is a problem that instructors must solve in presenting oral instruction. A well-presented lesson progresses by steps. When presented smoothly, the parts are connected by transitional words, phrases, sentences, or statements (fig. 20). Transitions make it easy for students to follow the instruction and to know when one point is finished and the next one introduced. Some techniques that help instructors to make smooth transitions are listed below. Vary these techniques; do not use the same one or two all the time.

(1) *Refer often to the objectives of your lesson.* For example, in teaching the principles of war, go to the next principle by referring to your objective:

FOR EFFECTIVE TRANSITIONS

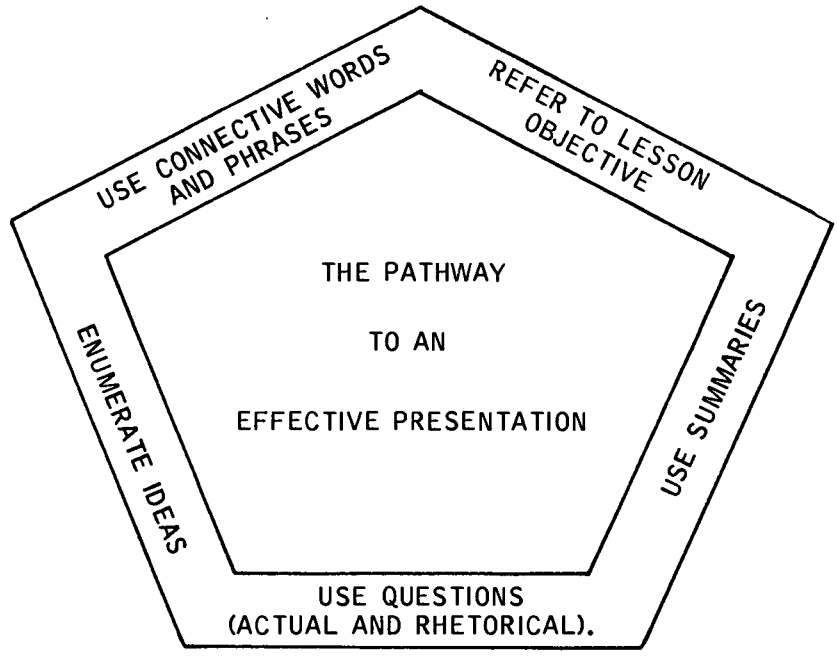

Figure 20. Going from point to point.

"Another principle of war that we must consider is the principle of mass." This is one very good reason for putting titles on slides and charts; it is possible to go back to the title in making transitions.

(2) *Use frequent subsummaries.* This is a valuable teaching technique because it makes use of repetition. The internal summary is also an excellent way to get from one point to another. For example, in the lesson on principles of war: "We have considered the principles of simplicity, unity of command, and the offensive; now let us consider the principle of maneuver."

(3) *Use rhetorical questions.* For example: "What other principle can we use as a guide to the exercise of command? We gain advantage over the enemy by applying the principle of surprise." Here the instructor answers his own question.

(4) *Use connective words and phrases.* Words such as "however," "moreover," "therefore," and "accordingly" all severe as signals that one idea is being closed and another being opened. Do not overwork one particular connective, and avoid such terms as "now," "all right," or "now we'll take up."

(5) *Enumerate points.* Use numericals—"first," "second," etc,—or list points on a slide or chart.

c. Maintaining Student Interest. The instructor must make every effort to vitalize his material so that the interest of his class will be high. He should never state or imply that his subject is dry. When the instructor merely talks, student interest is soon lost. To keep classes active and to promote learning, use the following:

(1) *Specific explanation.* The specific and the concrete are of interest; the general and the abstract usually are hard to follow and destroy interest. Be specific and avoid talking around a subject in vague or general terms.

(2) *Stories and experiences.* Army instructors are unusually fortunate in that they have a wealth of stories and ex-

periences that are applicable to their subject matter. These stories vitalize presentation. An instructor with combat experience can often emphasize the importance of a subject by telling just how it was applied in his unit. Further, Army professional publications contain stories and examples that can be used. A quotation from some prominent military leader helps to stimulate interest and vitalize instruction.

(3) *Illustrations and examples.* People are visual minded; they like to have ideas presented in picture form. Use illustrations and examples real or hypothetical; they are easily remembered and make abstract ideas clear.

(4) *Questions.* Questions bind instructors and students together. They arouse the sluggish; they compel those who hear to seek an answer.

(5) *Training aids.* The use of charts, diagrams, models, and other training aids helps to keep a subject interesting. Use training aids at points in the oral presentation where the lesson may seem dull. Aids used to vitalize oral instruction, hold attention, arouse interest, and help get teaching points across. For an explanation of training aids, see chapter 7.

d. Emphasizing Main Points. If main teaching points are not emphasized (fig. 21), the student may not grasp them, or he may soon lose them. One of the most effective methods of gaining emphasis is repetition; this is another reason for using frequent summaries in a lesson. Remember, repetition has its limits; it must be well-done and distributed properly or it becomes monotonous.

16. The Summary or Review

The summary should be used at any point in the lesson where there is a need for a brief recapitulation of the points covered. Frequent use of summaries throughout the lesson helps students to keep main points clearly in mind. The lesson should always be concluded with a *complete* summary—an overall picture of what has been presented in the lesson. This final summary or review is the instructor's opportunity to wrap up the lesson into a compact package for the students. Keep in mind that the review must be brief; do not try to reteach the lesson. The review (fig. 22) should contain at least the following elements:

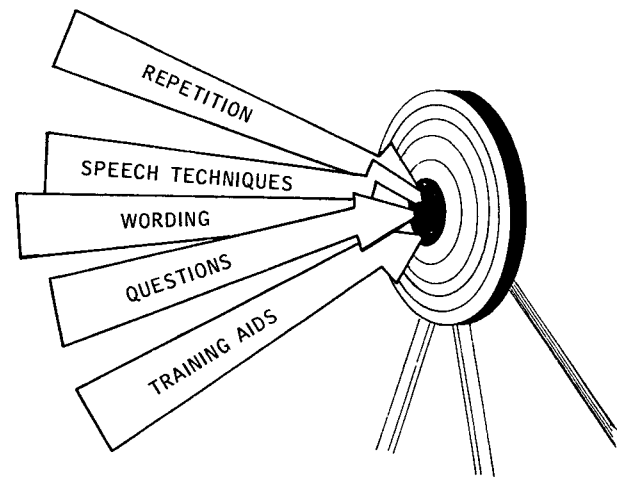

Figure 21. Emphasis and interest.

a. Answering student questions.

b. A re-emphasis of important ideas, steps of procedure, and safety precautions, when applicable.

c. A strong closing statement. The closing statement should leave a positive impression in the minds of the students. It may include a remark or two on some favorable results that were obtained by proper use of a principle, or the disastrous result of malpractice. Above all, it must be related to the objectives of the lesson and leave the students with a feeling of having accomplished their mission.

IN THE REVIEW

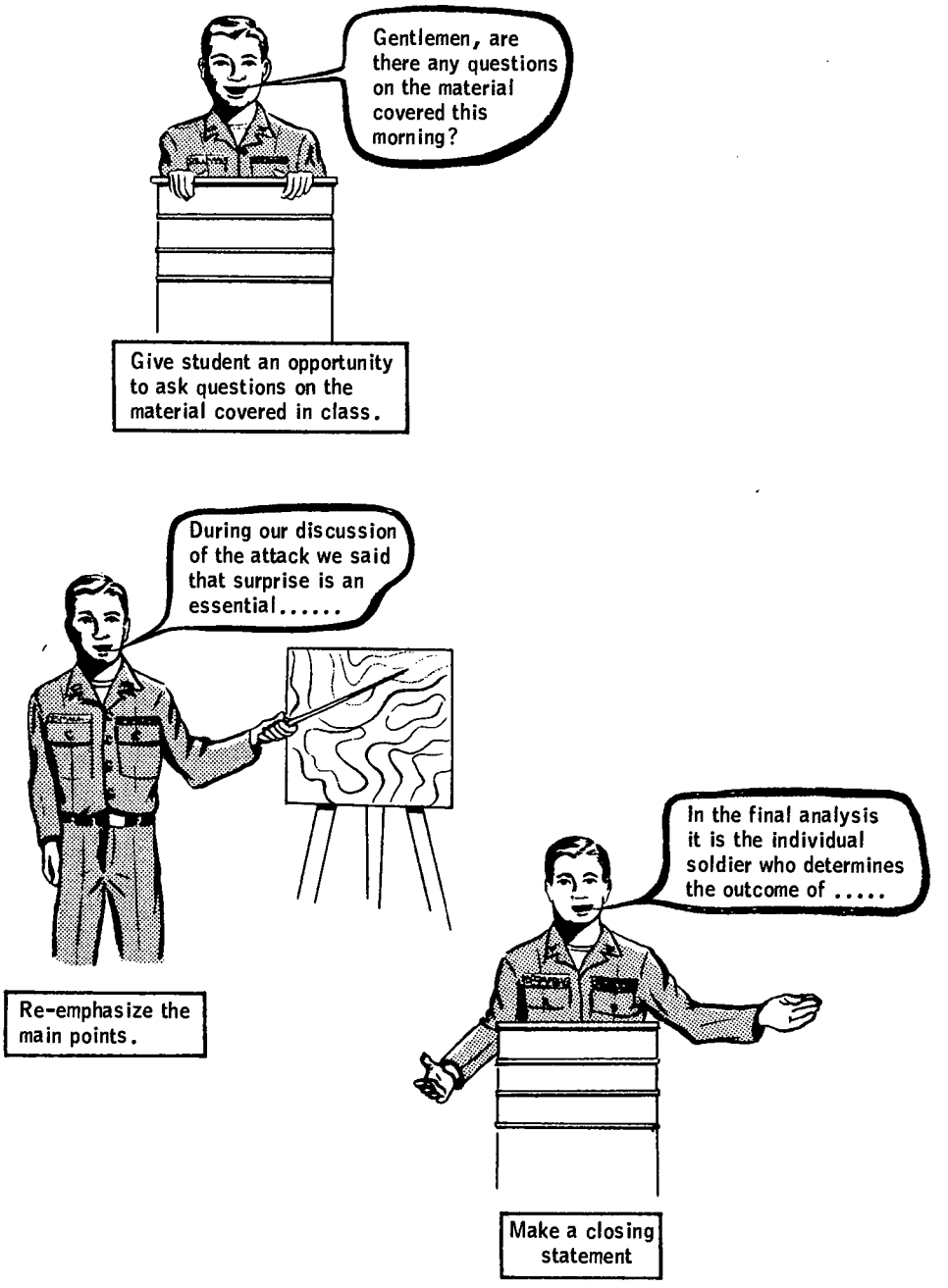

Figure 22. The review.

CHAPTER 5

SPEECH TECHNIQUES

17. General

Military leaders who can speak with clarity and logic possess an art that will always serve them well. The ability to speak effectively is essential not only to personal military leadership, but also to efficient instruction. Much of our military training and education takes the form of oral instruction. Unless oral instruction is presented with good speech techniques, interest succumbs to boredom, understanding is replaced by confusion, and soldiers are discouraged in their desire to learn. An instructor may know his subject thoroughly, he may have an effective teaching personality, he may have made complete preparation for presentation of a lesson, nevertheless, the quality of his oral instruction will depend largely upon the degree of his skill in the specific techniques of delivery. This chapter deals with certain specific speech techniques. Fundamentals are stressed. An instructor who has no serious speech defect should be able to improve his delivery significantly if he makes a genuine effort to apply these fundamentals.

18. Instructor-Student Contact

Instructors must realize that they are not making speeches, or talking at students, but are really talking with them. The purpose of speech is to communicate ideas. The instructor must establish personal contact with the class and keep that contact (fig. 23). Here are some suggestions that will be helpful—

a. Get the Attention of the Class First. Do not start the class until you have the attention of the students. In some cases, walking to the center of the platform will cause men to quiet down and listen; more often, it will be necessary to ask for their attention. A simple "Your attention, please!" will produce the desired result.

ARE YOU MAINTAINING CONTACT?

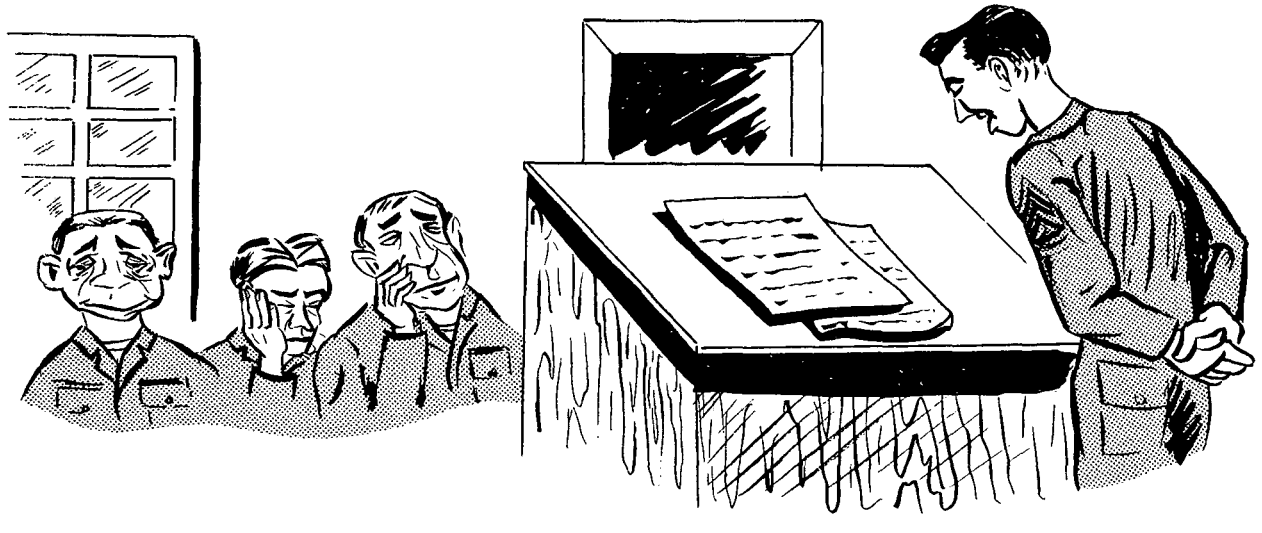

Figure 23. Maintaining contact.

b. Look at and Talk to Your Students. Observe people in earnest conversation and you will notice that the speaker does not look out the window or at the floor or ceiling. He looks his listeners in the eye. He probably is not conscious that he is doing so; the earnestness of his purpose naturally finds its expression in this personal contact. Address your students and not the training aids or the distant landscape. Give every student the feeling that you are looking at and talking directly to him. Keep eye contact.

c. Speak in a Conversational Tone. Do not let your voice reflect an impersonal, indifferent attitude. Do not orate or declaim. Make frequent use of the pronoun "you"; identify yourself with the students by "you and I" or "we." Leave the impression that you and they have something in common.

d. Be Alert! Look Alert! Know what is going on in your class. Pay close attention to students' responses. Listen carefully and evaluate their comments and answers to your questions. Be quick to spot an inattentive student. Look directly at him. Take a step toward him—or ask him a question. Continually ask yourself, "Do my students understand?" Check frequently to make sure they are following you.

19. Controlling Nervousness

Almost every instructor experiences nervousness to some degree prior to his initial appearance before a class. Nervousness simply indicates that the instructor is aware of the class and is concerned about their reaction to his instruction (fig. 24). Instructors who completely lack nervousness are likely to be stolid, unimaginative individuals who probably will never do more than a mediocre job of instruction. Under control, nervousness usually results in a more enthusiastic and expressive delivery. Good instructors usually devise their own particular techniques of making their nervousness work for them instead of against them. Some of these techniques are—

a. Be Thoroughly Prepared. The first step the instructor can take to overcome excessive nervousness is thorough mastery of the subject and the plan for teaching it. Then he must realize that the students are there to learn and that they are more interested in the subject than in the instructor. Think of the subject and of the learning that should result from the instruction, and nervousness will take care of itself.

b. Assume the Proper Mental Attitude. The most reliable weapon the instructor has for overcoming nervousness is a proper frame of mind toward himself, his students, and the entire instructional setup. To assume a proper frame of mind, he must make an intelligent, rational analysis of the situation. He must realize that the basis for the very unpleasant mental and physical reaction he experiences when before a class is fear—not of bodily injury, but of what the students will think of him and his instruction. Students expect their instructor to have full knowledge of the subject and to be able to teach it effectively. Although students focus their attention upon instructors, they do not immediately place them on trial. If the instructor has mastered his subject and has made thorough preparation, he has eliminated the real reason for fearing the reaction of the students; he has every right to a feeling of self-confidence, which will go far toward making his presentation a success.

c. Have Initial Remarks Well in Mind. The first few moments are the most difficult; get past these and things will go well. It is advisable to have the lesson introduction so well in mind that no notes are needed.

d. Review Previous Instruction. By starting with a reference to a phase of training previously completed, the instructor immediately causes the students to focus their attention on something with which they are familiar. The instructor thus meets the students on common ground.

e. Tell a Story. Nothing releases tension so quickly as a bit of humor injected early in the introduction. Remember that the story should make a point that can be related to the subject. When setting out to get a laugh, try to get one, but don't be discouraged if your students don't burst their sides; the next class may respond more vigorously. No great harm is done if a story falls flat once in a while.

f. Be Deliberate—Slow Down. When a person is nervous, body activities tend to speed up. Instructors should remember this when they

Figure 24. Controlling nervousness.

are faced with nervousness. They should be deliberate in movement and careful not to talk too fast. After a few moments of deliberate control, the stage fright will pass and the instructor's normal poise and bearing will take over.

20. Maintaining Bearing

Because students react to what they see as well as to what they hear and understand, instructors must make certain that they meet military standards of appearance, bearing, and bodily control (fig. 25). Posture, bodily movements, and gestures can be highly expressive. They can make the difference between an excellent, enthusiastic presentation, which stimulates students to effective learning, and a dull, uninteresting lesson, to which students make a weak response. Any physical attitude assumed, any bodily movement, or any gesture that attracts attention to itself is distracting and, therefore, is a hindrance rather than an aid. Movements should appear free, natural, and spontaneous. Remember to be natural at all times.

a. Maintain Good Posture. Take a position from which the entire class can see you and from which you can see all of the class. Stand erect, with weight evenly balanced on your feet. Look physically and mentally alert, but do not stand rigidly at attention. Relax. Let the hands and arms hang freely at your sides. The hands do not appear as large and awkward to students as they might seem to you. If you simply cannot let them rest at your side until ready to use them, clasp them in back of you, or let one hand rest on the speaker's stand temporarily. Do not wring and twist them nervously. The basic rule to remember is moderation. Don't remain glued to one spot and don't keep on the move all of the time. When you do move, move briskly and with purpose. As your skill and experience increase, you will find movement becoming less obvious and more meaningful.

b. Use Gestures. A gesture is the movement of any part of the body to convey a thought or emotion, or to reinforce oral expression. Your arms, hands, and body are your principal tools of gesture. When instructing, let your gestures

Figure 25. Military bearing.

AVOID MANNERISMS

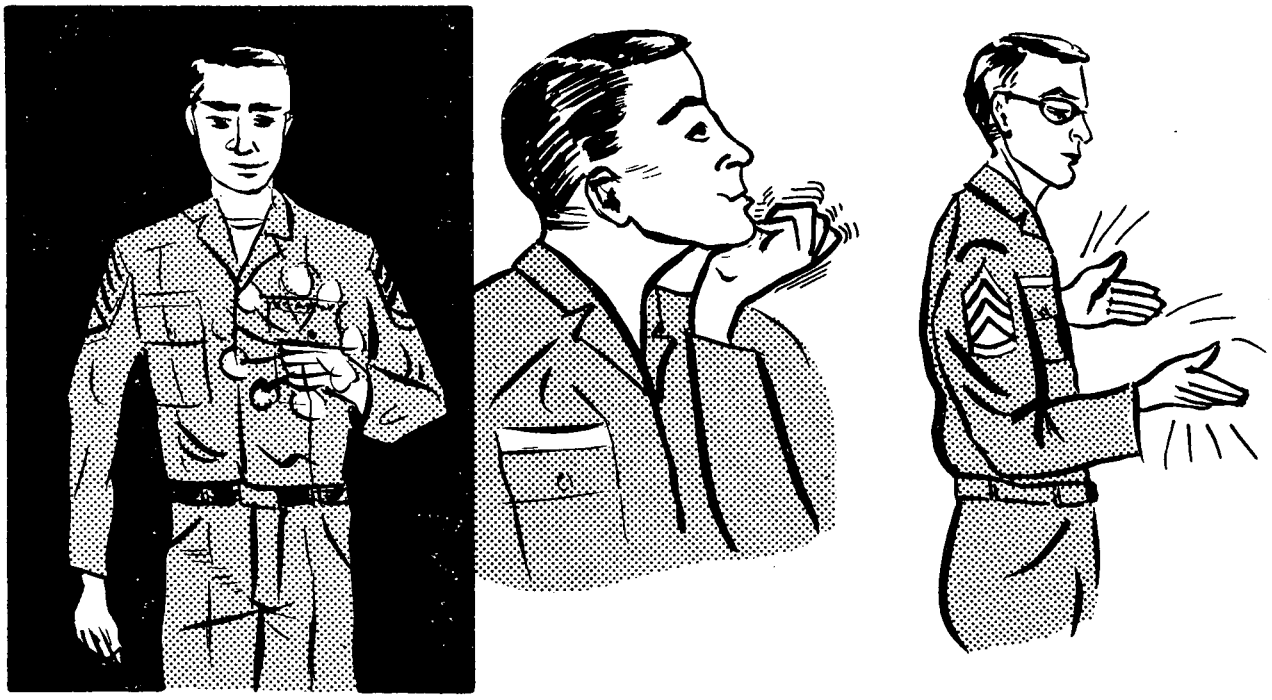

Figure 26. Mannerisms distract.

be natural; never rehearse specific gestures for use at definite points in your presentation. They should arise spontaneously from enthusiasm, conviction, and emotion. Do not try to emphasize every statement with a gesture; to do so will defeat the purpose of gestures.

21. Avoiding Distracting Mannerisms

A rule to remember is that instructors should avoid those things that cause the class to concentrate upon the instructor's mannerisms rather than on the subject matter (fig. 26). Instructors may not be aware of their peculiar mannerisms unless they ask associates for constructive criticisms of their delivery. Here are some common habits to be avoided:

a. "The dying warrior"—the instructor who leans heavily on the lectern, wears an air of exhaustion, and never moves.

b. "The fig leaf stance"—hands clasped in front below the waist, feet immovable.

c. "The walkie-talkie"—the pacer who never stands still.

d. "The chained elephant"—who stands with his weight first on one foot and then on the other.

e. "The change counter"—who counts the change in his pockets every two minutes.

f. "The swordsman"—who tries to duel with the pointer, and forgets to put it down when not in use.

22. Being Enthusiastic

There is no substitute for a physically vital and enthusiastic delivery (fig. 27). Enthusiasm is contagious. It is evident in one form or another whenever a person is doing something he sincerely likes. If an instructor is sold on his subject and conveys this feeling to the class, he will keep his students interested and eager to learn. Further, an enthusiastic instructor will help his students to develop a favorable

BE ENTHUSIASTIC

Figure 27. Enthusiasm.

attitude and appreciations for training programs. The basis for an instructor's enthusiasm is a thorough knowledge of the material being taught and its usefulness to his students.

23. Using the Voice

The instructor's voice is his best teaching tool because it is his most direct means of communication with the class. Most individuals have speaking voices adequate for instruction if they learn to manage a few factors that are basic to good speech.

a. Voice Quality. Voice quality (fig. 28) is the characteristic that distinguishes one voice from another. Some voices have a pleasant quality; others are unpleasant. However, the average instructor has a voice quality that can be made pleasant to his listeners, and further developed by overcoming any tendencies he may have toward nasality, hollowness, hardness, throatiness and monotone. A monotone has a deadening effect on students. Inflection will assist in overcoming monotone, in providing proper emphasis, in making the presentation more intelligible, and in providing a pleasing variation that will hold students' attention. Expressive speech may be obtained by change in the pitch, volume (loudness), rate of speech, or by a combination of all three.

(1) *Pitch.* Pitch of the voice should be the natural pitch that is used in conversation. The instructor should determine the pitch level at which he can speak with greatest ease and clarity and then vary this pitch to produce emphasis where needed. Variation of pitch breaks monotony and adds interest to the delivery.

(2) *Volume of voice.* The instructor must speak loud enough for all students to hear without difficulty. On the other hand, too loud a voice is deadening and the hearing or hearing attention of the student soon dulls in self-defense. Loudness requires volume—that is, the space-filling character of the voice. A thin voice can be loud, but mere loudness is not sufficient. If the instructor's voice has the proper volume, the students feel comfortable while listening. The instructor should vary the volume with the size of the class and the conditions under which the instruction is given. He can change volume to accent the proper syllables of words. Accent in pronunciation is described as a greater force or stress on a particular syllable. This means change in volume. Too great a volume of voice makes it difficult to change volume for accent and variation, and more difficult for the student to catch these changes in volume. Proper volume is especially important when teaching outdoors or in a building with poor acoustics. By watching student reaction an instructor can tell if they are having difficulty in hearing. If there is any possibility that the volume of your voice is not satisfactory, have an assistant in the rear signal you so that you can adjust your voice to the class.

(3) *Rate of speed.* Rate of speech should be governed by the thought, idea, or emotion that is being communicated to the students. Complex material should be presented slowly. The instructor should also consider the learning ability of the class in determining his speed of delivery. Change in the

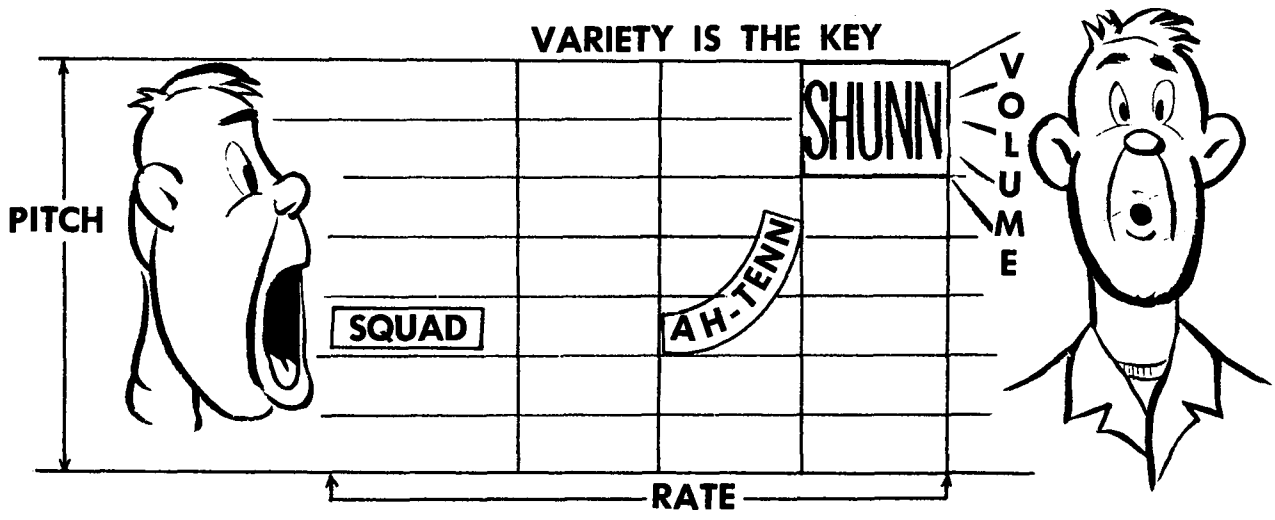

Figure 28. Voice quality.

TO ACHIEVE UNDERSTANDING

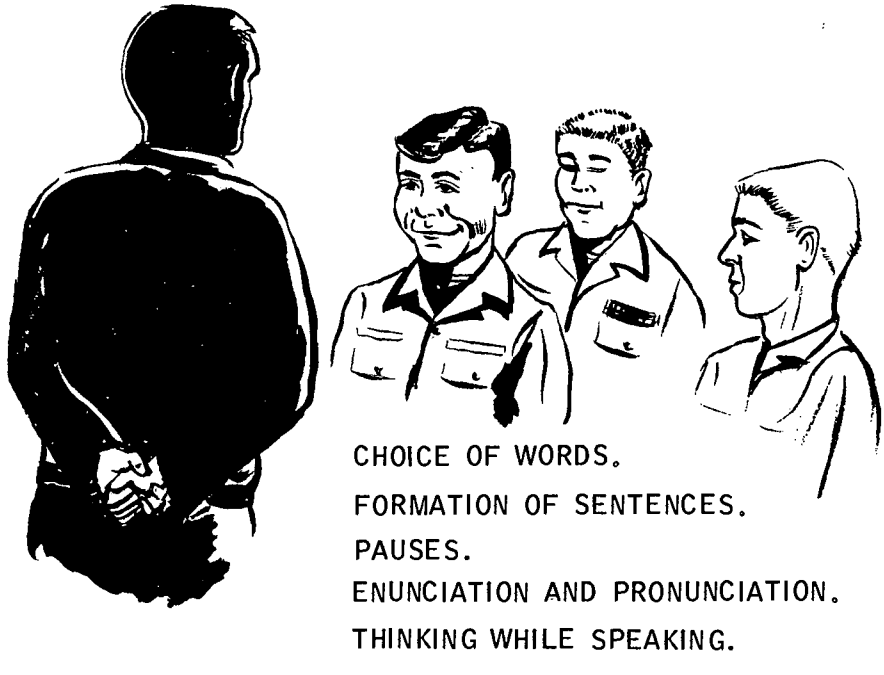

Figure 29. Being understood.

rate of speaking will create pleasing variations and produce emphasis. Expression and variety can be obtained by a change in pace. Advance your speed once in awhile, but also slow down or pause occasionally to lend variety and emphasis. Beginning instructors should tape record a presentation to check the rate of speech. Between 120 and 150 words per minute, is a normal speaking rate. If you speak over 160 words per minute, stu-

dents may have difficulty keeping up with you; if you speak under 90 words per minute, you normally will cause students to lose interest. Over-rapid delivery tends to confuse students; over-deliberate delivery tends to irritate them.

b. Being Sure You Are Understood. Successful instruction depends on how well students understand instructors (fig. 29). Certain principles of planning and delivering lectures will heighten this understanding.

(1) *Choice of Words.* Since language is the most important single tool of the instructor, he must develop a healthy regard for words. His words must be carefully chosen and his sentences must be developed clearly and logically. The right word in the right place is the keynote of effective speech as well as effective writing. Verbal communication depends on using those words that have the exact shade of meaning to make the thought clear. Consider the educational level of the group you are teaching. Use terms that are common to the vocabularies of your students. Do not try to impress students by using words with which they are not familiar. An instructor's purpose is to clarify, not to confuse. If certain complex terms are essential, use them, but define each new term the first time it is used. Use strong, meaningful, descriptive verbs that will leave vivid impressions. Add interest and color to your presentation by using a variety of descriptive terms. Use a variety of connective words; "and" is not the only connective in our language.

(2) *Formation of sentences.* Careful selection of words implies that they must be grouped properly in order to express ideas clearly and accurately. Use short sentences. Signal the end of your sentences by voice inflection. Eliminate unnecessary words and phrases. Do not pad sentences and clutter delivery with trite expressions.

(3) *Pauses.* Pauses provide the punctuation of speech. The proper use of pauses accomplishes four things: students are able to absorb ideas more easily; you get an opportunity to concentrate on your next point; you give emphasis, meaning, and interpretation to your ideas; and you get a chance to breathe. They should be clear and decisive; the "er-r-r," "ah," or "uh-h" in the pause is a mental crutch that instructors cannot afford to use. The deliberate pause should not be confused with the uncertain hesitation. Pauses are a definite part of the art of speaking.

(4) *Enunciation and pronunciation.* Instructors must speak clearly and distinctively. Strive for clarity of expression. It makes no difference what part of the country you are from; enunciate clearly, and students from all parts of the country will be able to understand you. It's not necessary to change your whole pattern of speech. Pronounce or accent each syllable distinctly and clearly. It may be necessary to enunciate more forcefully and deliberately when instructing a large group than when carrying on a conversation. Be particularly careful to enunciate each syllable of new terms that may not be common to the vocabulary of your students. Avoid slurring, swallowing, or mumbling words.

(5) *Thinking while speaking.* Speaking is not a purely mechanical procedure. Instructors' words must not only be spoken clearly and distinctly, they must also be chosen and grouped to express clear and definite ideas. An idea to be expressed clearly, must first be thought out. Ideas are formulated with words. The faulty choice of words that makes for weak expression is indicative of faulty, weak thinking. Learn to think while standing before the class; think on your feet. During the pause that follows a statement, formulate the next sentence. As you speak, think about what you are saying. If you have difficulty finding

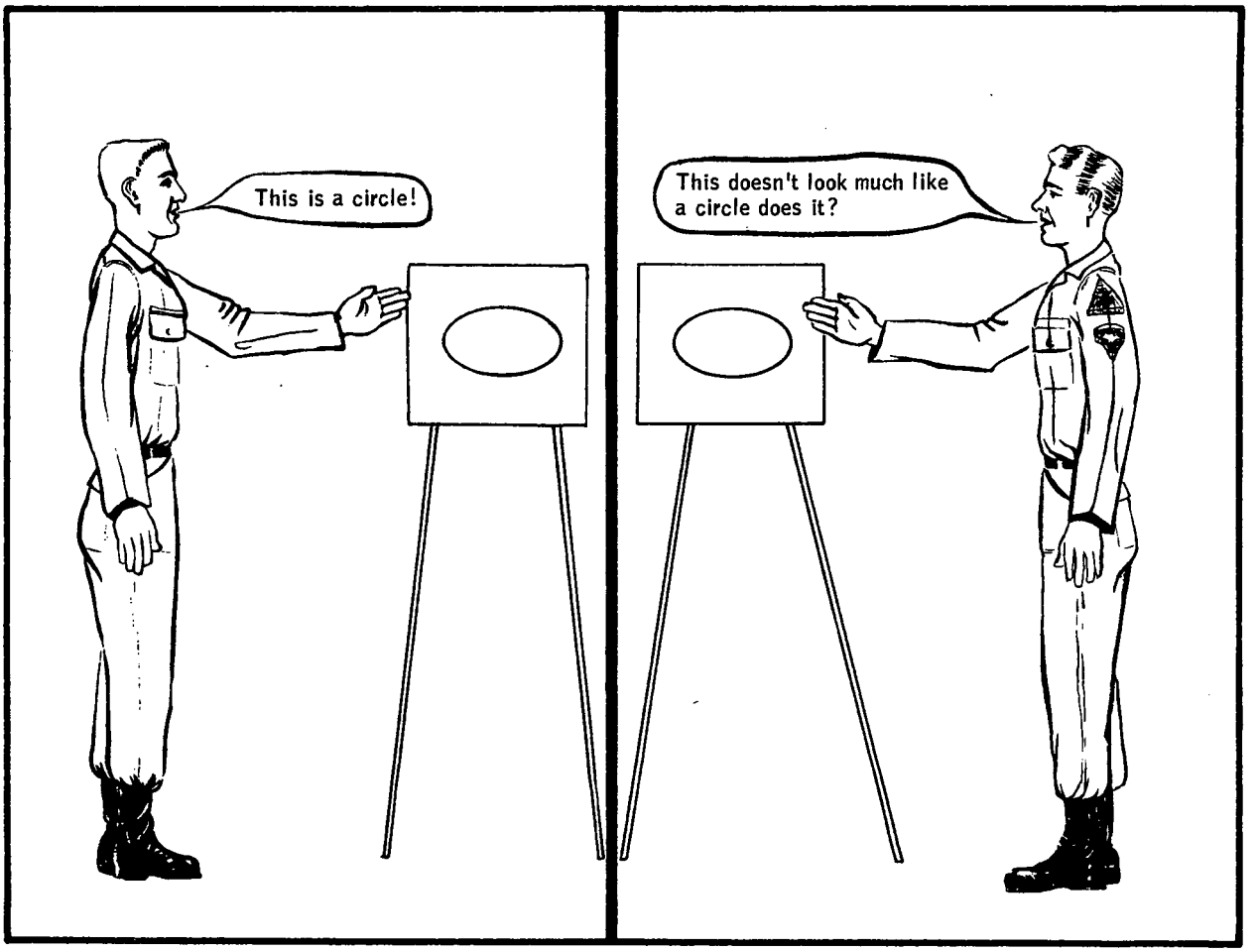

Figure 30. No excuses.

words to express yourself when standing before your class, try writing the key points of the lesson, in short, complete sentences. You can clarify your thinking and improve your presentation by writing the complete text of what you intend to say; however, an outline, rather than the written lesson, should be used when actually presenting the material. As a last resort, memorize key statements.

24. Avoiding Excuses

Do not apologize or reflect an apologetic attitude. Do not make any comment that can be construed as an excuse for lack of preparation, knowledge, ability to teach, or the conditions under which instruction must be given. Excuses only accent weaknesses (fig. 30).

25. Developing Effective Speech Habits

Instructors will improve their speech only if they carefully analyze it, determine their weaknesses, adopt a plan for improvement, have a desire to improve, and practice speech improvement. Some of the major concerns in developing effective speech habits are—

a. Critical Understanding. First, develop a critical understanding of why the speech of others is either good or needs improvement. While listening to a television or radio speaker, try to analyze the speech techniques employed. In other words, become alert to how others speak.

b. Standards. Then, establish standards for your own speech. Through such measures as self-analysis, friendly criticism from associates, and listening to your recorded speech, find what your strengths are; work to make them stronger. Learn your weaknesses and work to correct them.

c. Practice. Finally, practice good speech at all times. Too often we have one set of speech techniques for the platform, others for conversation, and still others for home. Good speech should be practiced constantly. Make use of recordings; take every opportunity that comes your way to address an audience, and consider every period of instruction an opportunity to improve speech techniques.

CHAPTER 6

QUESTIONING TECHNIQUES

26. Student Participation

a. Instruction, whether in a classroom, tactical training area, or on a firing range, must not be a one-way street. Mere exposure of students to the instructor's explanation and demonstration of ideas offers little guarantee of learning. Assuming receptiveness and understanding on the part of students, the instructor may anticipate absorption of the information he presents. However, the difference between passive absorption and active learning is often in proportion to the students' participation in discussion and application of the ideas presented by the instructor.

b. This chapter is concerned with techniques that can be used by instructors to actively engage the student in the learning situation even though specific practical exercises are not included in the lesson plan. Methods and techniques for planned practical work are presented in chapter 9.

27. Advantages of Questioning (fig. 31)

a. Improves Student Interest. Class interest increases when student participation is obtained by questions, whether asked by the instructor or in response to his solicitation of student questions. Students generally are more interested in hearing one of their group than the continuous discussion of the material by the instructor. They feel that they contribute to the instruction if they are permitted to ask questions and respond freely to questions posed by the instructor.

b. Stimulates Student Thinking. Students are more alert when they are held responsible for learning. They will pay closer attention and think more about the subject if they know that questions will be asked. Instructors who use questions and encourage student questions are promoting the students' intent to learn.

c. Adjusts Instruction to Class Level. Questions help the instructor to adjust his instruction to the rate of learning of the class. If the students consistently fail to respond correctly, the instructor must simplify or expand upon his previous explanation. Questions also reveal misunderstanding that can be corrected on the spot.

d. Reveals Student Attitudes. Students' responses often indicate their interests and attitudes towards the subject or, perhaps, the entire training program. Student attitudes are important to the instructor, as they reveal the presence or absence of motivation.

e. Permits Student Contributions. From their experiences or reading, students will have new ideas and new applications of the lesson material and should be encouraged to contribute these to the class. Such participation is most desirable, as it stimulates interest, adds variety, and also adds material to the lesson.

f. Provides Emphasis and Reinforcement of Main Points. Retention of important points is made easier by frequent recall. The mere fact that a question is asked on a partiular point provides obvious emphasis of that idea. Responses to questions and proper evaluation by the instructor serves to reinforce the correct ideas in the students' minds.

g. Checks the Effectiveness of the Instruction. One of the best methods for checking the understanding of ideas is by direct questioning during instruction. This reveals the effectiveness of the methods, techniques, and approach used by the instructor. Student answers to these questions reveal the specific areas where the instruction has been the least effective.

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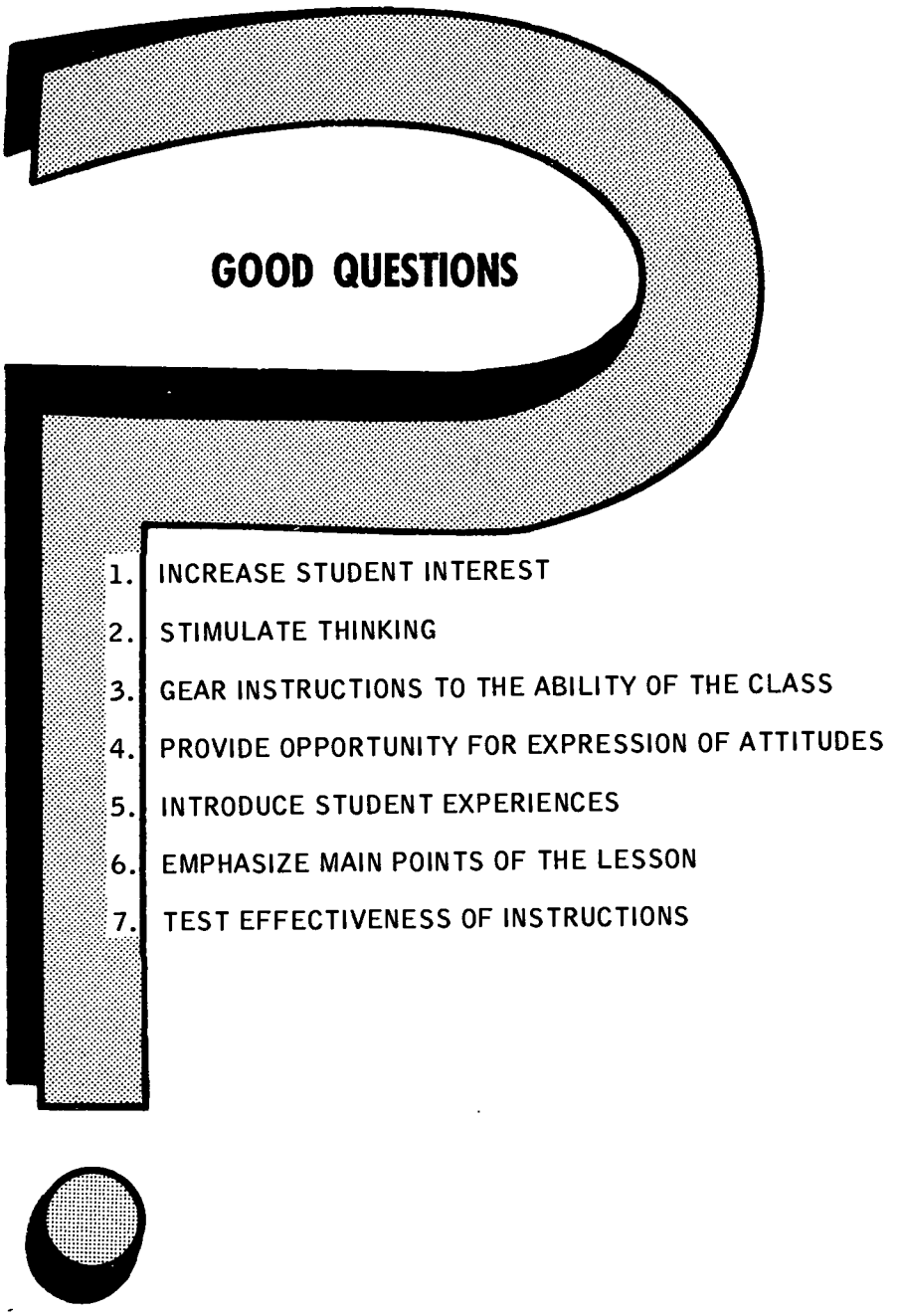


Figure 31. The value of questions.

28. Planning for Questions

The use of questions requires careful preparation. Planned questions should be written into the lesson plan to emphasize main points, to stimulate interest, and to insure class participation at various points. Improvised questions should be used whenever they appear to be desirable. Solicitation of student questions promotes class participation. The background and experience of the class will influence the use and nature of questions; however, the lack of knowledge and inexperience of the students are not valid reasons for absence of participation. The skilled instructor can obtain some degree of participation in all teaching situations. All instructors should understand the following three key questioning techniques:

THE GOOD QUESTION SHOULD HAVE A SPECIFIC PURPOSE

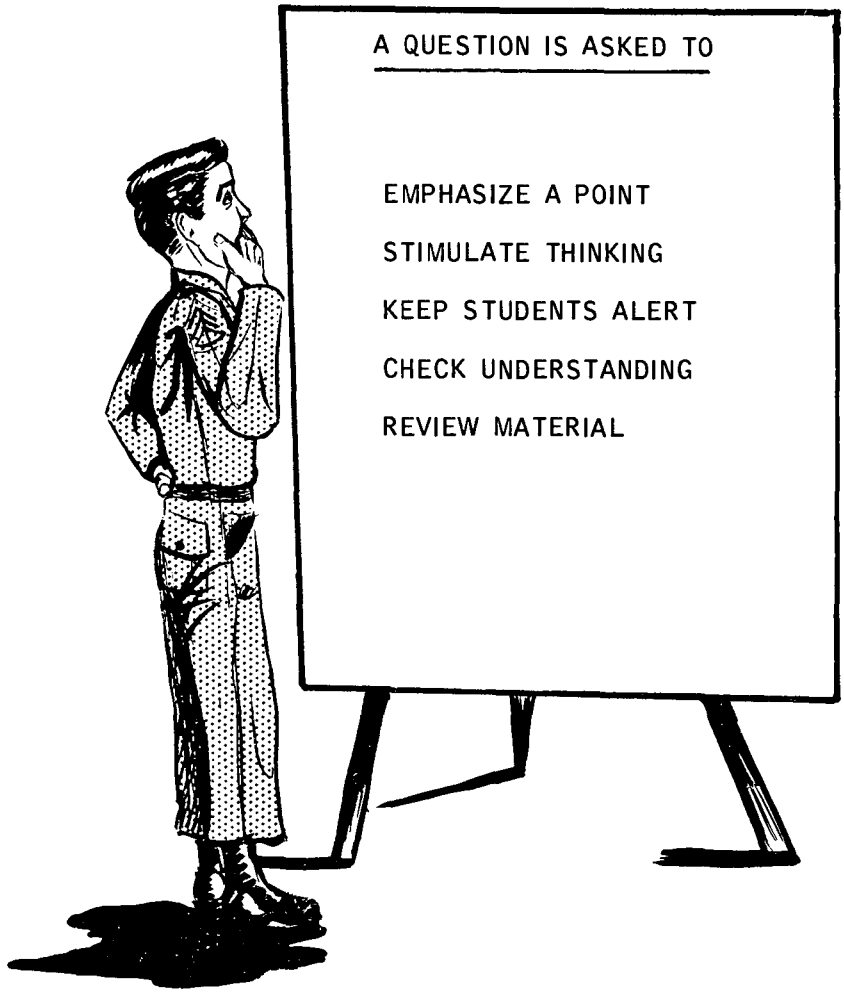


Figure 32. A good question.

a. Proper phrasing of questions.

b. Best procedure for asking questions.

c. Effective control of response.

29. Phrasing the Question

Poorly expressed questions actually discourage active participation and serve to confuse the class. A good question should—

a. Have a Specific Purpose. Questions should be designed for definite purposes (fig. 32). One question may be used to emphasize a major point, another to stimulate thought, and another to arouse class interest and make students more alert. A question may have as its purpose a check on immediate understanding, whereas a later question on the same point may be asked for recall. Instead of asking "Any questions?", the instructor should be more specific and relate his inquiry directly to the understanding of the subject matter just covered.

GOOD QUESTIONS SHOULD BE UNDERSTOOD BY ALL STUDENTS

Figure 33. Understanding the question.

b. Be Understood by Students. Questions should be phrased in terms and language so that students understand what is wanted. Avoid lengthy questions that require clarification. Simply worded, direct, and easily understood questions serve best (fig. 33).

c. Emphasize One Point. Avoid asking two questions in one. If the question requires several responses, distribute the requirement among several students. Furthermore, it is generally unsound and unfair to require one student to make a lengthy and detailed response when dividing the requirement would result in more equitable participation (fig. 34).

d. Require a Definite Answer. State the question so that a definite answer is required. Do not allow student to bluff. A vague and indefinite question invites a vague answer (fig. 35).

e. Discourage Guessing. Avoid questions that can be answered "yes" or "no" unless you require the students to explain their answers. Questions that strongly suggest the correct answer should not be used. If a student's response does not reveal whether he understands the point or has merely guessed the answer the question has probably been poorly phrased (fig. 36).

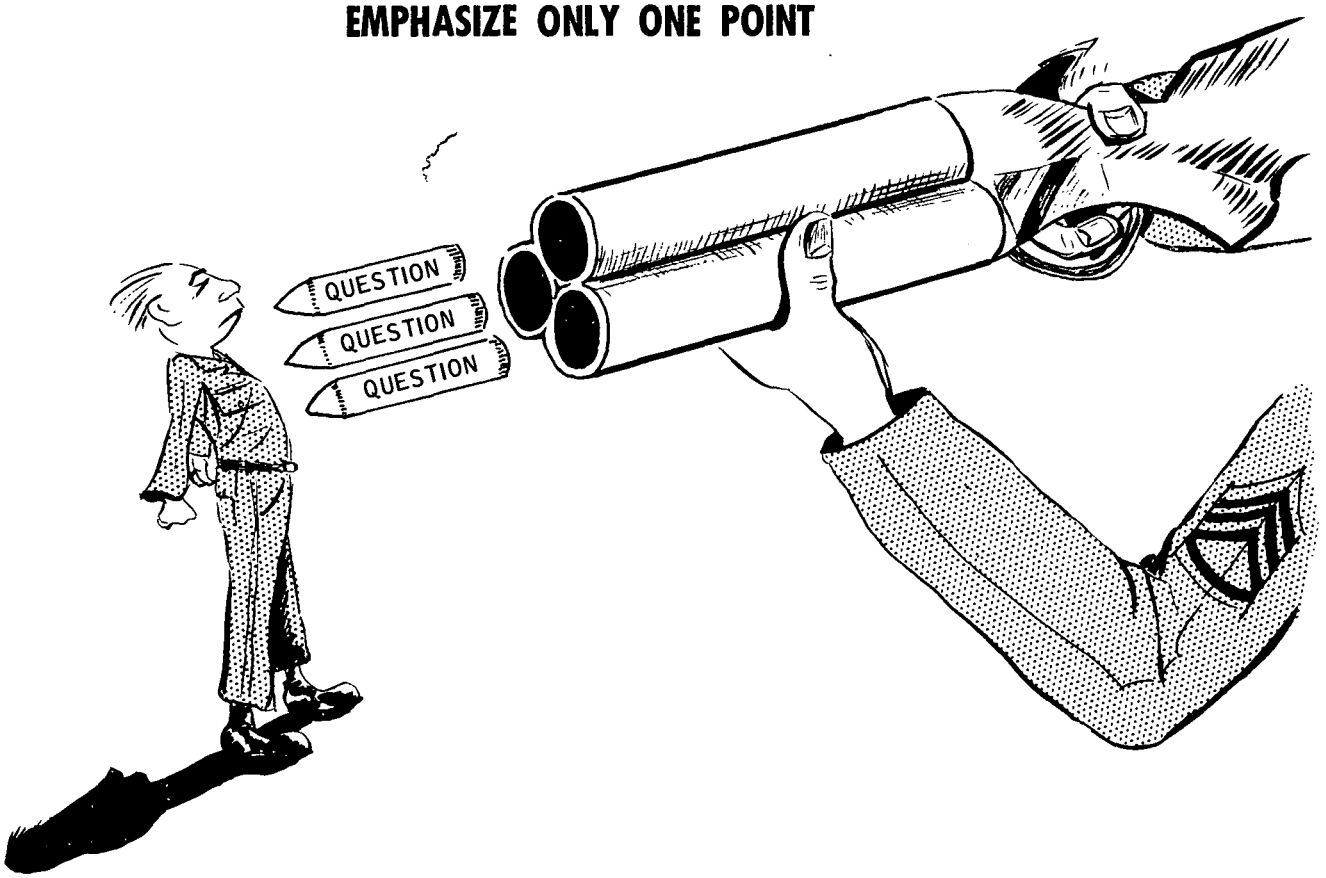


Figure 34. Emphasizing one point.

30. Asking the Question

Apply the following procedure (fig. 37) in asking a question:

a. Alert the class to the fact that a question is about to be asked. Little is accomplished by "sneaking in" questions that only a few students recognize. Ask the question in a natural, interested, and conversational tone, and make sure that it is heard by all of the class. This technique invalidates such responses as—"I didn't hear the question," or "would you please repeat the question?"

b. Address the question to the entire class before designating a student to answer. This holds the attention of the whole group. Each student is motivated to think and to form a tentative answer because he knows he may be the one who will be called upon. Conversely, if the instructor first names the student, the remainder of the class tends to relax while the question is being asked.

c. Pause briefly between asking the question and calling on a student, to provide stimulation for student thinking.

d. Distribute questions among the class for fullest student participation in the discussion. Avoid calling on students in any set order or limiting questions to the most alert or superior students.

31. Handling Student Answers

a. Require the student to address his response to the entire class and speak loud enough to be heard by all. If necessary, cause him to repeat his response.

b. Require the student to raise his hand if he wants recognition and not to answer without being called upon.

A GOOD QUESTION SHOULD REQUIRE A DEFINITE ANSWER

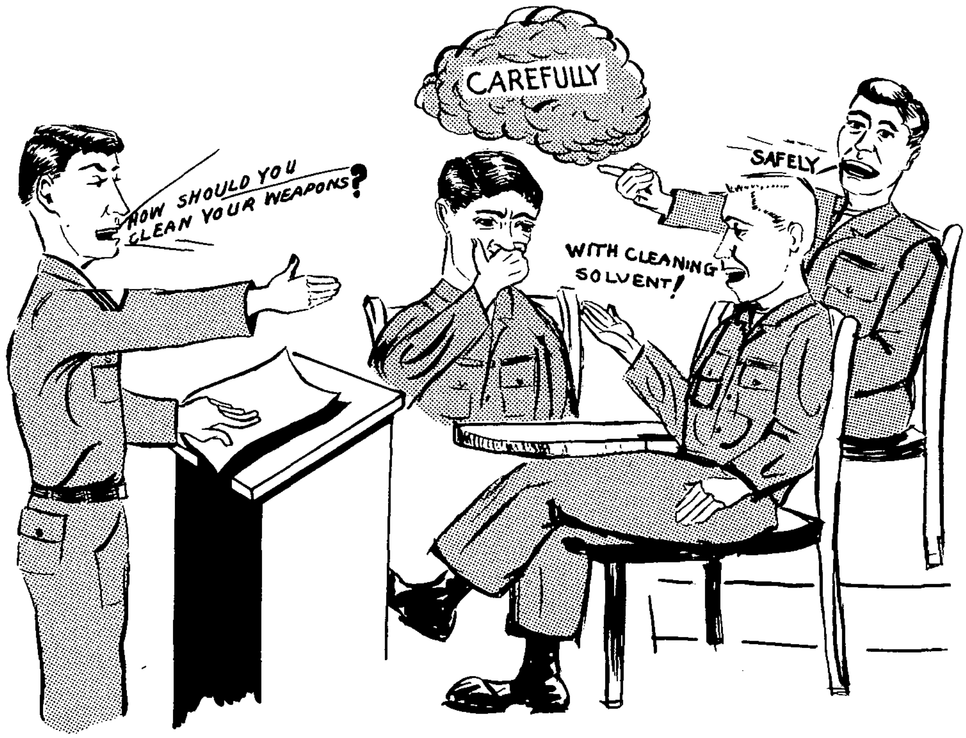


Figure 35. Requiring definite answers.

c. Evaluate each student answer according to its merit. If necessary, elaborate or have the student clarify his answer when it is vague. In many instances, it is beneficial to delay final evaluation of a response until other students have given their answers. Do not proceed from the discussion of a question or a problem without assurance that the class understands the correct answer.

d. Encourage the student to respond to the best of his ability even though he may be uncertain of his knowledge. Do not accept "I don't know" without some effort to draw a positive response from the student.

32. Encouraging Student Questions

a. Encourage students to ask questions. Let them know, at the beginning, that questions are welcome. Pause frequently during the explanation and solicit questions. The number of questions asked by students is often an indication of their interest in the subject.

b. Relaying student questions to other members of the class is an acceptable technique in obtaining maximum participation.

c. Don't bluff in the event you cannot answer a students question. Tell the class that you will find the answer and give it to them later; then keep your promise.

THE GOOD QUESTION SHOULD DISCOURAGE GUESSING

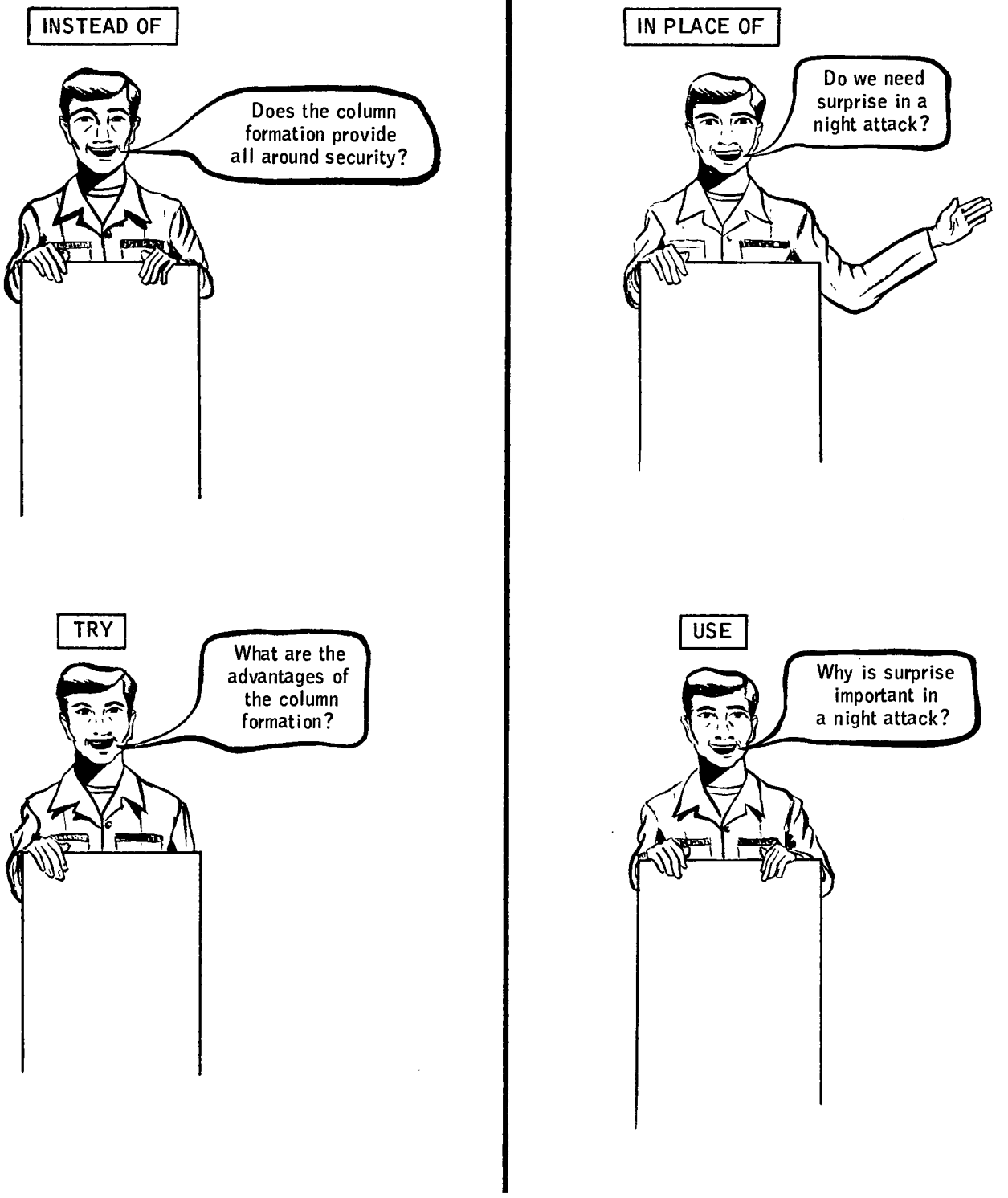
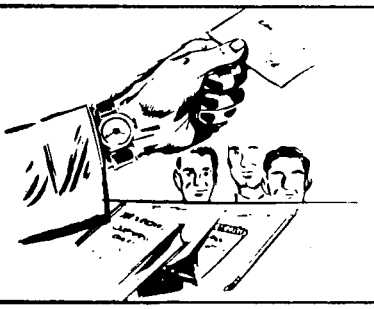


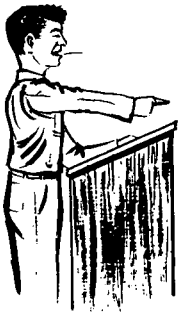
Figure 36. Discouraging guessing.

1. ASK THE QUESTION.



2. PAUSE.

3. CALL ON THE STUDENT.



4. RECOGNIZE AND EVALUATE THE STUDENT'S ANSWER.

Figure 37. How to ask questions.

CHAPTER 7

TRAINING AIDS

33. Value of Training Aids

Training aids are essential to effective instruction (fig. 38). In the hands of good instructors they are powerful tools. As do skilled craftsmen, instructors must know how to make the best use of the tools of their profession. They must be expert in the selection, procurement, construction, and use of training aids. Good instructors use training aids because they recognize their real value. The use of training aids helps the instructor to—

a. Appeal to the Senses.

(1) Learning begins with stimulation of the senses. The more senses involved in the learning process, the more likely it is that learning will take place. Words, whether written or spoken, fade away and are often inadequate to convey delicate meanings, understandings, and appreciations to the minds of students. By using training aids, instructors are able to reach the minds of men through more than one sense channel.

(2) More people see alike than hear or read alike. For example, consider a situation in which members of a class on the caliber .50 machinegun read a description of how it functions, or the instructor explains its functioning without the use of training aids. In both instances, the description itself may be accurate, but few members of the class will receive the same mental picture. Yet the same group, given an opportunity to see the functioning along with the instructor's explanation, will get mental images that will be quite similar and will correspond closely to the actual facts the instructor wants to get across. Because of its appeal to students through more than one sense channel, visual instruction is much more effective than words alone.

b. Interest the Student. Training aids add interest and vitalize the instruction. They focus the students' attention upon the lesson being presented. When properly used, they add variety to the presentation. In many training situations use of the actual object, a model, or a training film adds realism to the subject, providing the student motivation that helps maintain his state of readiness for learning.

c. Develop Understanding. The most important reason for using training aids is to make it easier for students to learn. Good aids simplify, add emphasis, and help to clarify difficult points of subject matter. Through their use, students' impressions become more intense, resulting in a clearer understanding of things taught. This is true not only with slow learners but also with students of high levels of intelligence. Training aids help provide uniformity in teaching and frequently assist in the preservation of continuity of thought. This is particularly true in training situations where students are required to remember a certain procedure or to learn such principles as those of fire and maneuver.

d. Save Time. Training aids help students to learn faster. It would be impossible to teach most Army subjects in the time available without the use of aids.

34. Selection of Training Aids

a. Carefully examine the lesson objectives to determine where training aids are needed to aid student learning. Do not fit the instruction to the training aid; fit the training aid to the instruction. Use of too many training

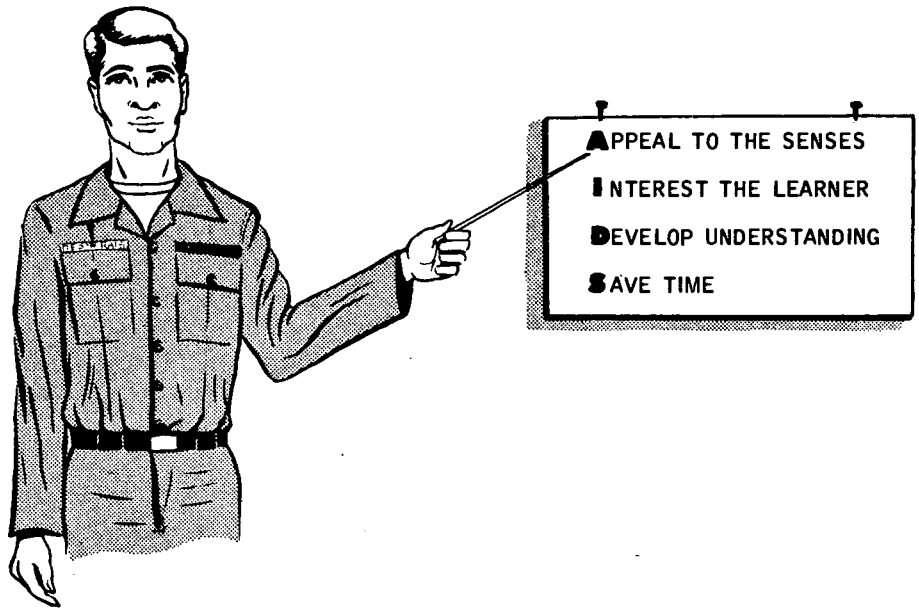


Figure 38. Training aids.

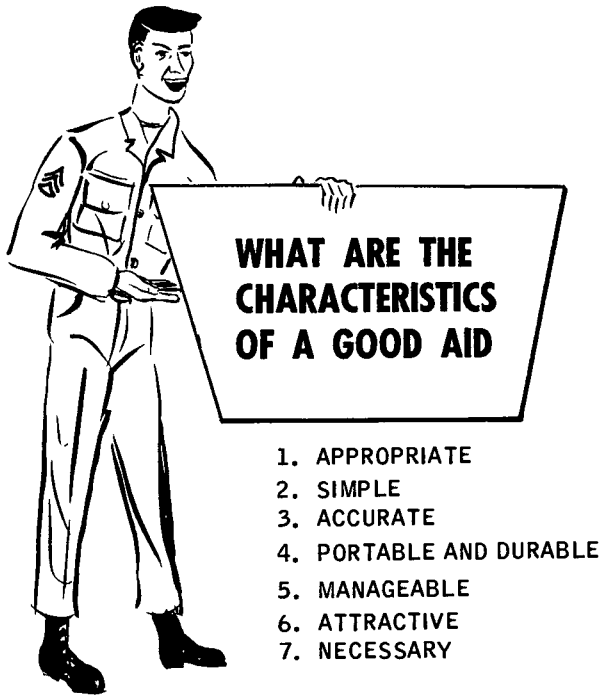


Figure 39. Characteristics of a good training aid.

aids will create confusion and hinder student learning. Remember, there are many types of training aids and each has certain advantages and limitations.

b. By using a variety of training aids you increase student learning and interest. However, do not interrupt the flow of ideas by using more aids than are necessary to assist in supporting the point.

c. Instructors should constantly examine the subjects they teach with a view to improving training aids and developing new ones for more effective student learning. Publications containing training aids information are listed in appendix I.

35. Characteristics of A Good Training Aid (fig. 39)

For an aid to be effective, it must have certain characteristics—

a. Appropriate. Any training aid should be relevant to the subject matter and to the background of the class being taught. It should reflect good taste and judgment on the level of intelligence of grown men. In planning for the use of an aid, the instructor should consider the size of the class, the place where the aid will be used, and whether the aid can be seen from the rear of the class. Lettering should be a minimum of 1 inch for every 32 feet of viewing distance.

b. Simple. Training aids should be easy to understand. They should be geared to the average training level of the class. Unduly compli-

cated aids may cause attention to be focused on the aid rather than the subject. Eliminate all unnecessary information and details.

c. Accurate. Be sure that all facts and figures are correct and based on current doctrine.

d. Portable and Durable. Training aids should be light in weight or constructed for takedown into easily assembled components, to insure portability. Aids should be constructed with durable materials that will withstand use out of doors and rough handling.

e. Manageable. An aid should be easy to operate and manipulate. Intricate special devices are of value in certain types of training, but usually the most effective aid is simple, neat, and practical. A good training aid should be designed to illustrate the lesson being taught without breaking its continuity. The aid should be so constructed that it can be presented to the class conveniently without distracting attention.

f. Attractive. The aid should attract the attention of the student. Neat, clear labels and correct spacing will lend eye appeal and make important points stand out. Too many words will clutter the aid. Color, used carefully, helps to emphasize main points; too much color is distracting.

g. Necessary. Each training aid should illustrate essential material and contribute to the successful accomplishment of the learning objectives. Training aids should never be used merely for "eyewash," to fill in time, or to entertain students. The use of too many aids tends to decrease their value to the presentation. The expense and effort of construction should be justified by the value of using the aid. In many instances the actual item of equipment is better than an aid. For purposes of economy, standard aids or locally produced charts should be used whenever they will accomplish the learning objective, in preference to fabricating elaborate models or cutaways.

36. Techniques in Use of Training Aids

a. Prepare For the Use of the Aid. Know your aids thoroughly and be prepared to answer any questions concerning them (fig. 40). Rehearse the lesson several times using the aid as it is to be used in the actual presentation. Make thorough advance preparation for using the aid. For example, when using Army graphic training aid portfolios or throwover charts, tab with paper clips or similar devices those pages that are to be used in the presentation so that you can quickly recognize the right charts. Another technique is to write lightly on each page the title of the next page to be used. Either technique will help smooth out the transition from one point to another.

b. Explain the Aid to the Class. Elaborate

Figure 40. Preparation for the use of the training aid.

EXPLAIN THE AID

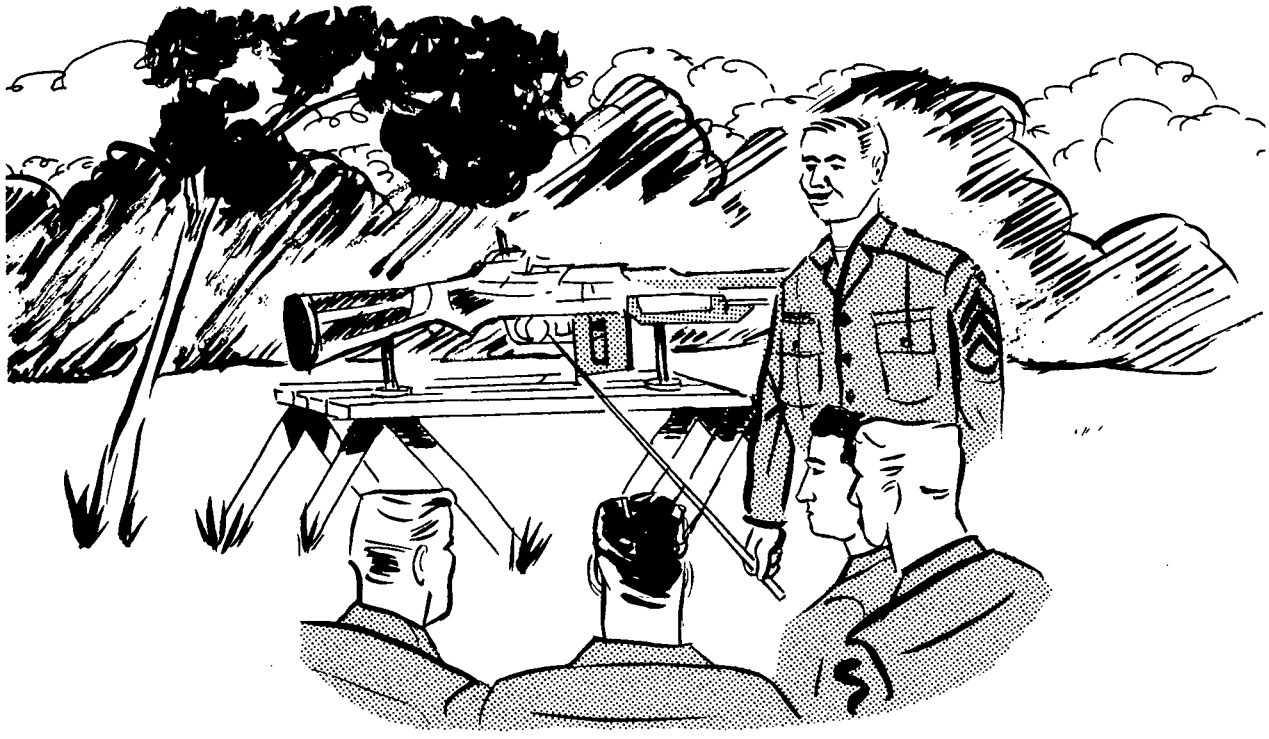


Figure 41. Explanation of the training aid.

aids are often used to illustrate highly complicated and technical subjects. When first showing such an aid briefly explain its purpose or function (fig. 41). Otherwise, students will attempt to find their own explanation of the aid and miss part of your presentation.

c. Keep the Aid Covered When Not in Use. Large charts can be covered by tacking or stapling sheets of wrapping paper over them. If a chart contains lines of printing, covering strips of paper can be cut to the size of each line, and later removed one at a time. Machinery, weapons, and similar aids can be covered with target cloth or some like material. Sheets of plain paper can be inserted into an Army graphic training aid portfolio to keep the pages covered until the instructor desires to use them. These practices will prevent the aids from distracting students' attention when not being used (fig. 42).

d. Show Aid So All Can See. Display the aid so that all students can see it (fig. 43). If the aid is a chart or graphic portfolio, view it from the rear of the room to make sure that it is legible. Change the seating arrangement to enable students to see better. The finest aid is of little value if all students cannot see it.

e. Talk to the Class, Not to the Aid. Some instructors become so involved with their training aids that they forget their students (fig. 44). Even while disassembling a piece of equipment, the instructor should maintain eye contact with his class. When explaining a chart or chalkboard drawing, stand, if possible, along side the aid; this will help eliminate any tendency to talk to the aid rather than the class.

f. Use a Pointer. A pointer is useful in focusing the students' attention on a particular part of the training aid (fig. 45). Hold it steadily on the part of the aid that you want the class to observe. Hold the pointer in the hand nearest the aid to enable you to maintain

KEEP THE AID COVERED WHEN NOT IN USE

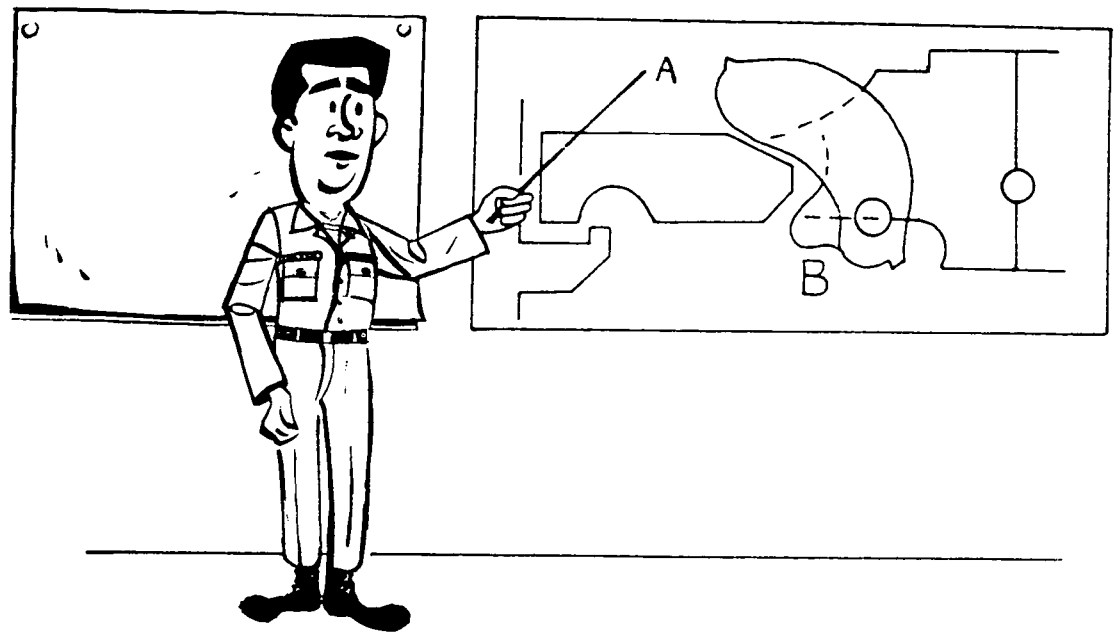


Figure 42. Keeping the training aid covered when not in use.

better eye contact with the class. Holding the pointer across the body tends to cause you to talk to the aid rather than to the students. Put the pointer away when it is not needed; it is easy to acquire distracting mannerisms with a pointer that is not being used.

g. Use Assistants to Best Advantage. If you use assistant instructors, make sure that they are well-rehearsed, so that they will know exactly what they are to do and when (fig. 46). If an assistant is to show projected aids for you, have a prearranged signal so that he will know when to change slides or turn off the projector.

h. Display Aids Smoothly. When using several aids, number the aids in the order in which they are to be used. If heavy equipment is to be used during the class, make sure that it can be moved in quietly without undue disturbance (fig. 47).

37. Types of Training Aids

There are many types of training aids, and each has certain advantages and limitations, depending upon the mission of the lesson and the nature of the subject matter. Too many ideas presented at one time or too many details on any one training aid will tend to confuse and hamper student learning. Many times a particular aid is constructed to be used as a memory guide and does not accomplish the desired results. Decide what type aid will best assist student learning. Training aids should be distinguished from training equipment and training facilities. For the purpose of this manual, the items listed below, when used for training purposes, are classified as training aids.

a. Actual Equipment. The actual equipment is the most realistic training device. However, the instructor must consider the size of the student body when using actual equipment. During instruction on the disassembly and assembly of a weapon, students should be arranged so that all can see. The actual equipment is not always the best aid. For example, when

SHOW AID SO ALL CAN SEE

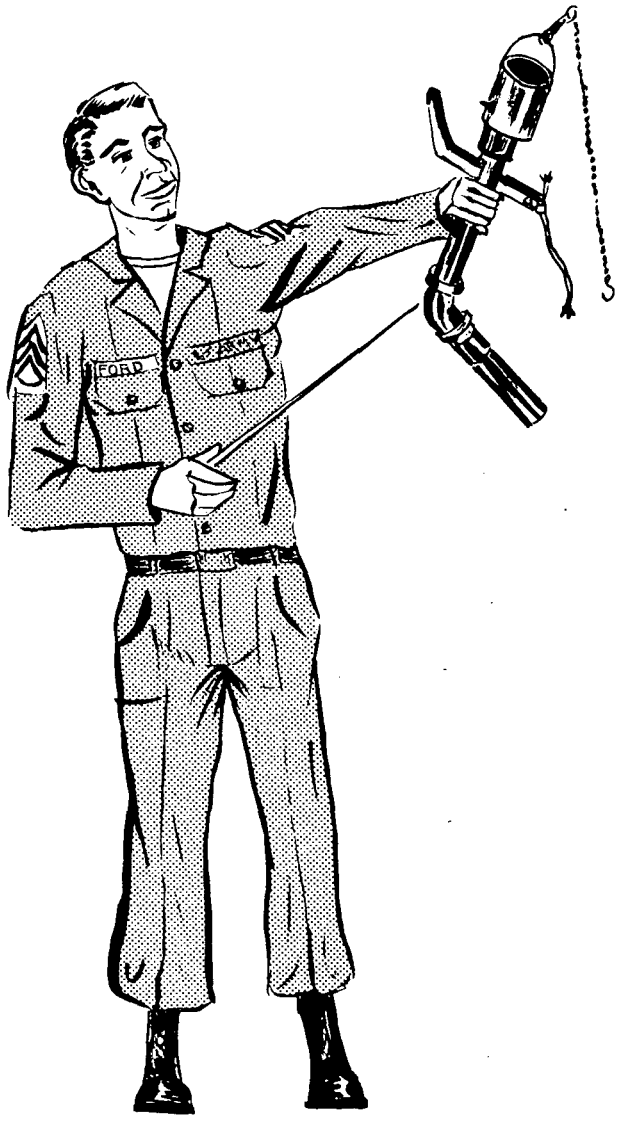


Figure 43. Showing the training aid so that all can see.

showing how to adjust a carburetor, time a vehicle engine, or remove spark plugs, use of the actual equipment would make it difficult for students to see. During such instruction the actual equipment should be used in conjunction with other types of aids, or by suspending a mirror over the engine compartment so that all students can see what the instructor is doing.

b. Models. Models are frequently used in conjunction with or in place of actual equipment. Models are recognizable three-dimensional representations of the real item (fig. 48). They are usually built to scale. An example of using the model effectively is the use of miniature tanks on a terrain board or sand table.

c. Mockups. Mockups are imitations of the real thing. They may, but do not have to be similar in appearance. Some elements may be eliminated to focus attention on others.

d. Graphic Materials.

(1) Graphic training include charts, diagrams, graphs, sketches, cartoons, maps, and wall boards. Graphic materials should be used in connection with the device being explained.

(2) Color adds to the effectiveness of graphic training aids. When color is used the instructor should explain its purpose. For example, the color red could be used to emphasize the electrical system of a vehicle engine, the color green to identify the fuel system, and the color yellow to identify the hydraulic system. Color should be used primarily for emphasis.

e. Displays.

(1) The display may include a wide variety of devices. Walls, floors, ceilings, hallways, barracks, orderly rooms, day rooms, outdoor training areas, and motor parks are frequently used by the instructor to display material that becomes a functional part of learning. Displays help create an atmosphere and environment for learning.

(2) To be effective the display must be carefully visualized and planned. The content of the display and the arrangement must be designed to support learning. The cleverness of the display is the result of careful planning and hard work.

f. Venetian Blind. The Venetian blind is a very effective training aid when used to outline the lesson objectives or supporting material. The lettering on Venetian blind strips should be neat, attractive, and orderly. Capital letters, large enough for all to see and read, should be used. The items should be exposed one at a

TALK TO CLASS, NOT TO AID

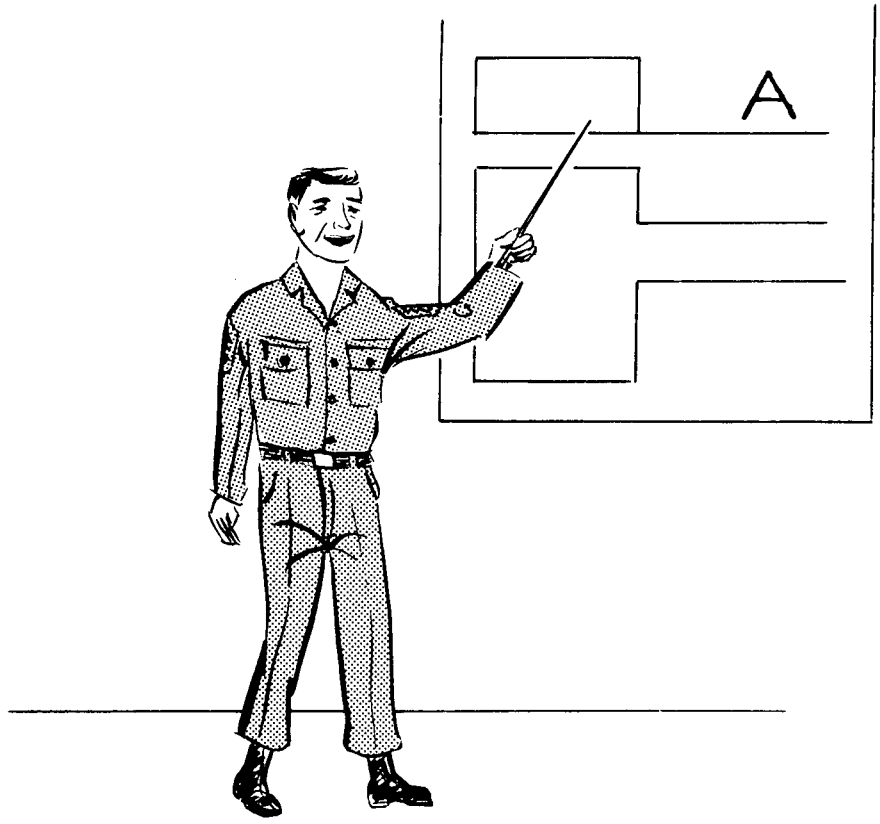


Figure 44. Talking to the class, not to the training aid.

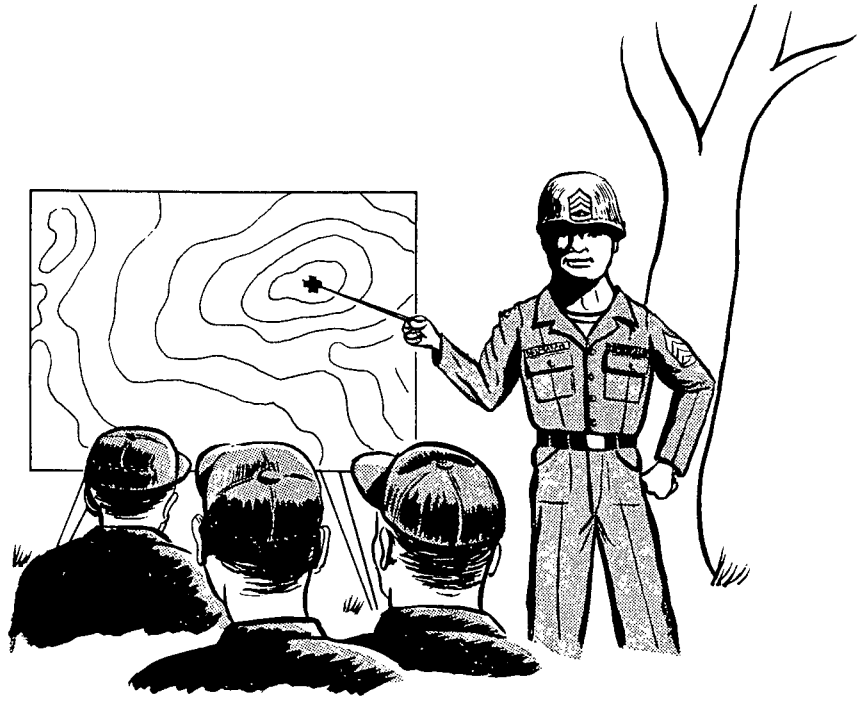


Figure 45. Using a pointer.

USE ASSISTANTS TO BEST ADVANTAGE

Figure 46. Using assistants to best advantage.

time, and each discussed thoroughly before the next item is exposed. Venetian blind strips should be summarized in the order they were taught; in other words, start from the top and summarize from the top. This provides a mental drill for the student. The instructor should not try to question from the unexposed portion of the Venetian blind, as he would be asking the student to guess what would be exposed next.

g. The Chalkboard.

(1) *Description.*

(*a*) The chalkboard is a flexible and useful training aid. It is often misused, because of the lack of understanding of the technique of use and the potential of the chalkboard.

(*b*) The chalkboard can serve the instructor in many ways. He can place topics, questions, sketches, diagrams, teaching points, supporting material for teaching points, problems, and solutions on the chalkboard. By use of the overhead projector or the opaque projector, transparencies, pictures, graphs, newspaper clippings, and magazine articles can be shown on the chalkboard and traced in chalk to present needed visualization.

(*c*) The templet can be used for drawing on the chalkboard when drawings need to be accurate, exact, or will be used repeatedly.

(*d*) Pencil marking or tracing placed on the chalkboard in advance can be traced with chalk to provide a clearer and more professional picture to the student.

(*e*) Many chalkboards are designed to be used as magnetic boards, thus providing a means for using a combination of materials on the chalkboard.

(*f*) Fluorescent chalk used in conjunc-

DISPLAY AIDS SMOOTHLY

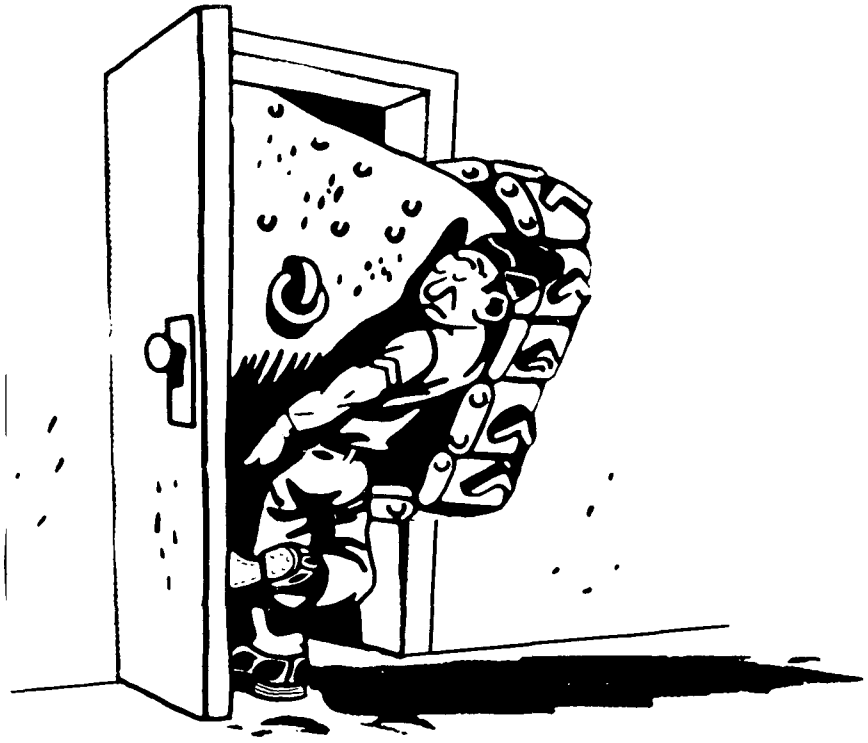


Figure 47. Displaying aids smoothly.

tion with black-light creates special effects that will enhance student interest. For example, nuclear fireballs can be dramatically reproduced on the chalkboard.

(*g*) The chalkboard is an excellent medium to promote class participation. Students feel that they contribute to the class when their answers, suggestions, or comments are placed before the class on the chalkboard.

(2) *Using the chalkboard* (fig. 49).

(*a*) Obtain everything needed for chalkboard work before the class meets—chalk, ruler, eraser, etc.

(*b*) Check for glare. Be sure that every student will be able to see the work. Check the lighting; sometimes it will be necessary to lower a shade or turn off certain lights. If the chalkboard causes a glare, use wrapping paper as a board and draw with colored chalk (purple or black). Green chalkboards do much to overcome glare and eye fatigue; these boards can be constructed by painting a hard smooth wood, such as plywood, with a flat green oil paint. Yellow chalk stands out more clearly than any other on these boards. More colors of chalk can be used on green chalkboards than on black chalkboards.

(*c*) Keep the chalkboard clean. A dirty chalkboard gives the impression that the instructor is not prepared.

(*d*) Plan your work in advance. Show layouts in the lesson plan. Before the class begins, use a pencil to sketch the work on the chalkboard—the class cannot see the markings. You can follow the penciled sketch when writing or drawing with chalk.

(*e*) Keep material simple and brief. Concise statements are most effec-

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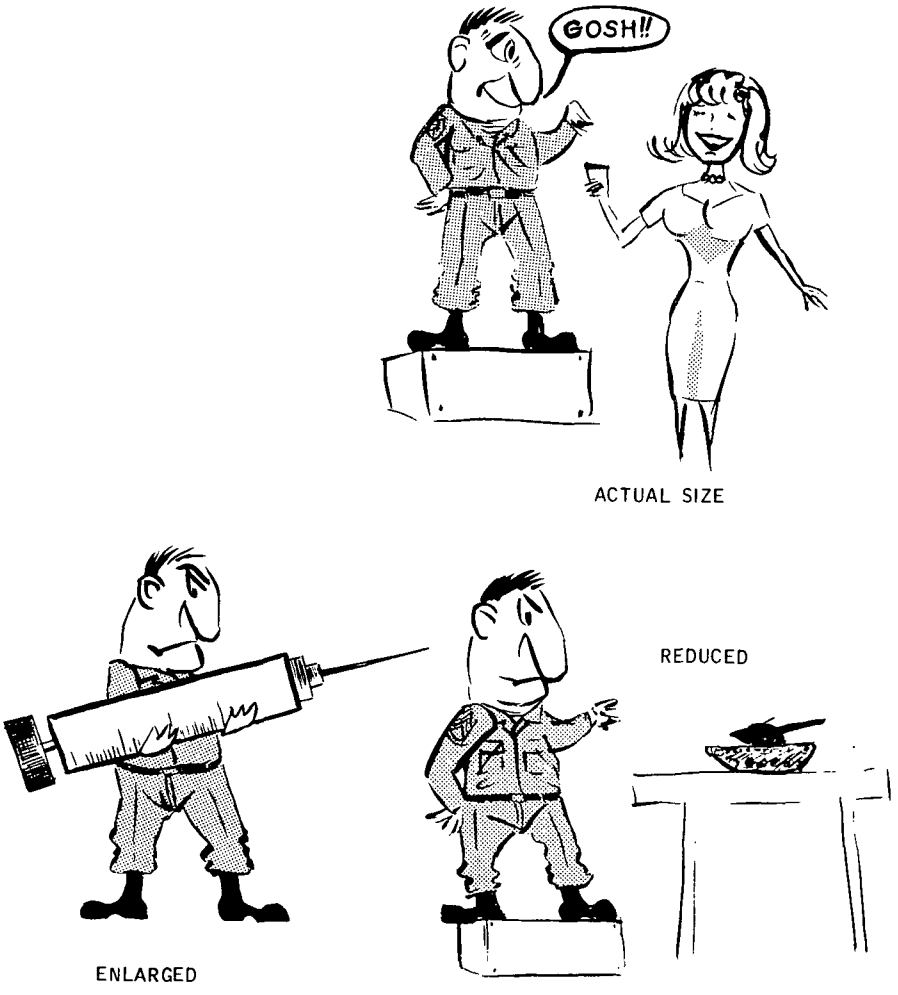


MODELS

Figure 48. Models.

tive. One word, with oral explanation by the instructor, will often serve to clinch the point.

(*f*) Print and draw legibly, and large enough so that printing and drawings are visible throughout the classroom. Do not allow printing to decrease in size gradually.

(*g*) Use color for emphasis and variety. Yellow and green are sometimes effective for underlining material. However, some colors do not show up clearly; try them in advance. It is worth the extra effort.

(*h*) Do not crowd the work. A few well-spaced points are more effective than too many points crowded onto the chalkboard.

(*i*) Erase unrelated material. Having other work on the board distracts attention from the point you are making. Use an eraser or cloth, not your fingers.

(*j*) Prepare complicated illustrations beforehand and cover them with paper. Strip them when needed. This saves time and makes the presentation smoother.

h. Blanket and Magnetic Boards. These display devices are especially useful in teaching such subjects as organization, formations, and tactics where visualization requires a progres-

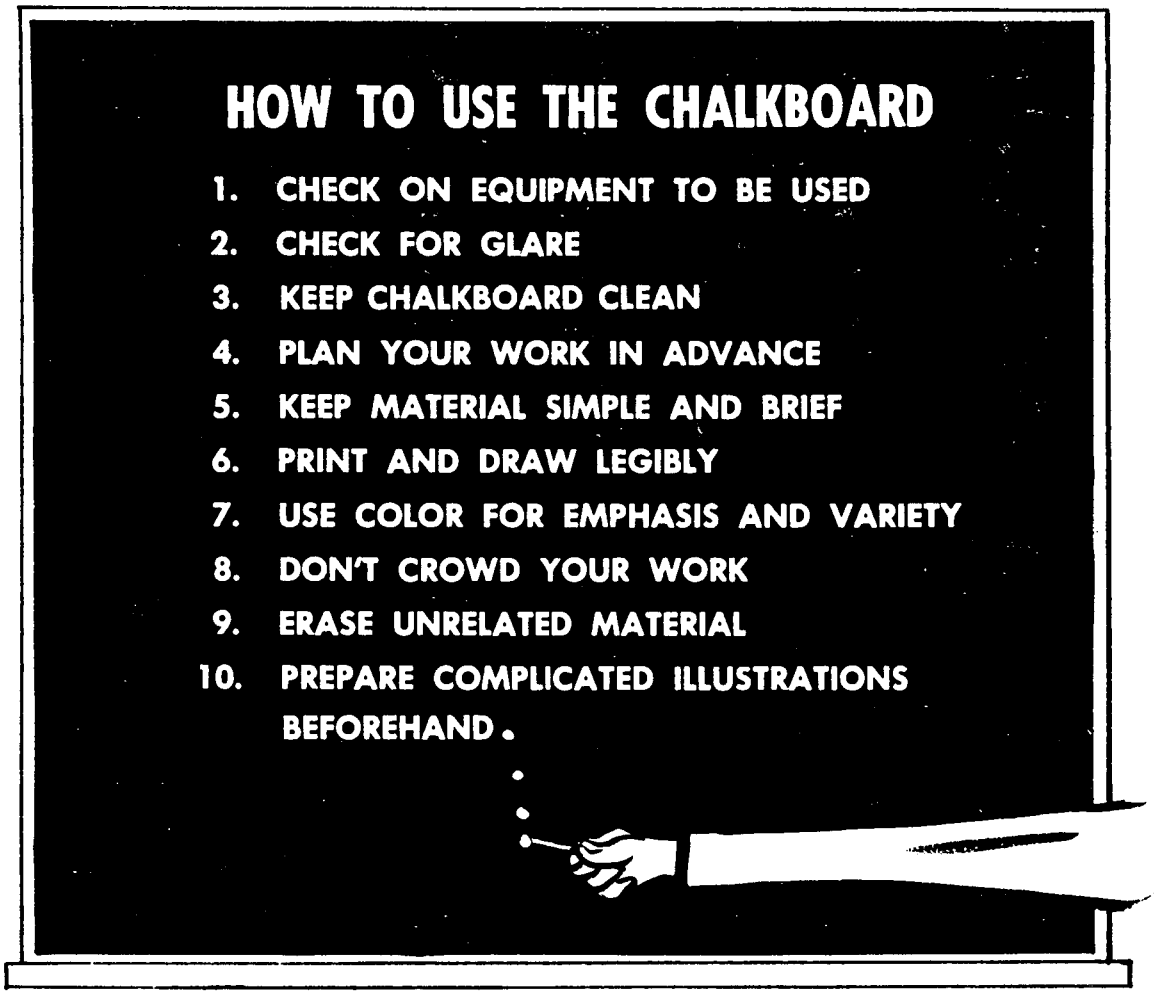


Figure 49. The chalkboard.

sive build-up or movement of symbols or cut-out silhouettes. The blanket board can be made by stretching an Army blanket over a frame and by backing appropriate cardboard cut outs with coarse sandpaper. When these cut outs are slapped against the blanket, they adhere to it. The same effect can be achieved with cut outs backed with pressurized adhesive tape and "slapped on" a chalkboard or any other smooth flat surface, and with cut outs backed with small magnets and "slapped on" a metal chalkboard.

i. Training Films. The training film (fig. 50) is effective in illustrating and demonstrating concepts and activities difficult to explain in the classroom in any other manner. Films present standard instruction to successive and widespread audiences. They are effective in arousing emotions and changing attitudes. They teach faster and more fully than the lecture and can reach even those students who have little education. For maximum training value, the instructor should follow certain procedures in showing the film.

(1) Carefully preview and study the film in advance. No training film is perfect. Select the key points to be emphasized, items that may be omitted or touched upon lightly, and portions that are obsolete or need explanation. Plan in advance your introduction and followup activities. Instructor's film references are available through film libraries for most training films and will assist you in planning your presentation. These film references contain such information as the running

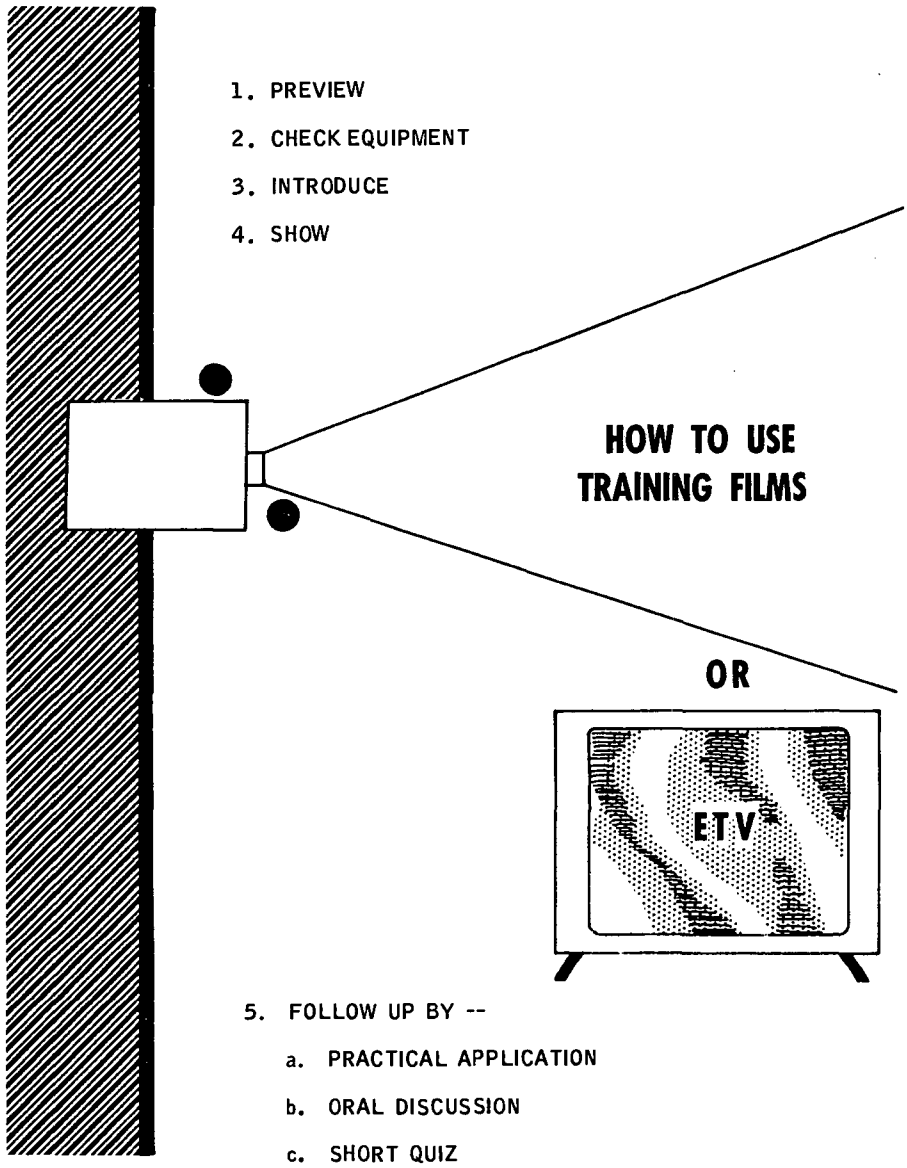


Figure 50. Training films.

time of the film, a short synopsis, suggested introductory remarks, and a suggested quiz as a followup of the film.

(2) Make a final check of the film and equipment prior to class. Show a short portion of the film to insure that you have the proper film and that all equipment is in order.

(3) Following this preparation, prepare the class for observing the film. Tell the students what the film is about and why it is shown, its battle importance, the key points to observe, and the relation of the film to earlier training, experience, and duties. Such procedures make the difference between merely showing training films and using them effectively as aids to instruction.

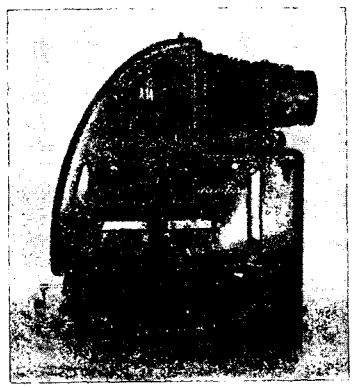
(4) Stop the film to explain a difficult point or emphasize a key point.

(5) Carefully plan your followup activities. Include an oral discussion to emphasize key points, or an oral or written quiz. In some cases, instructors will use demonstrations to emphasize procedures and techniques shown in the film. When practicable, the showing of the film should be followed by applicatory exercises; then, if time permits, it is advisable to follow up applicatory exercises with a second showing of the film as part of the critique. Experience has shown that learning and retention are appreciably increased by a second showing, and, having taken part in the exercise, the student will gather more information the second time he sees the film.

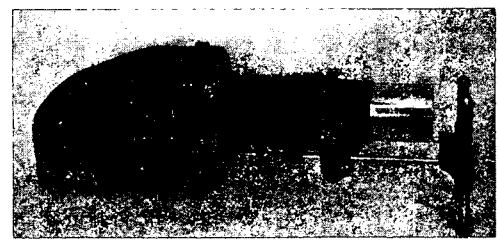
j. Film Strips. A film strip consists of a length of standard motion picture film containing still pictures of a specific subject. Showing the film strip requires more activity on the part of the instructor. It is best to have an assistant operate the projector so that the instructor is free to explain and to use a pointer to direct student attention to specific features of each picture. The picture sequence can be stopped at any time for discussion and clarification of points not understood.

k. The Overhead Projector.

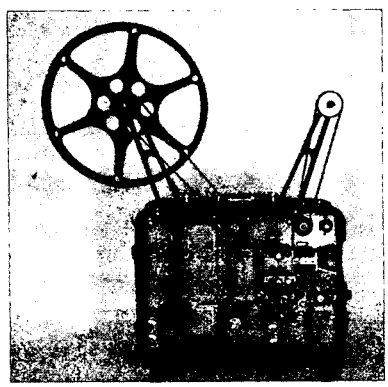
(1) The overhead projector (fig. 51), which projects large transparencies onto a screen or flat wall surface, is widely used by the Army instructor and is available through audio-visual communication centers. It can be used in lighted and ventilated rooms, permitting students to take notes. The instructor can face the student body while operating this projector, thus maintaining contact. A wide variety of techniques may be used to prepare materials for use on the overhead projector. The instructor can point out



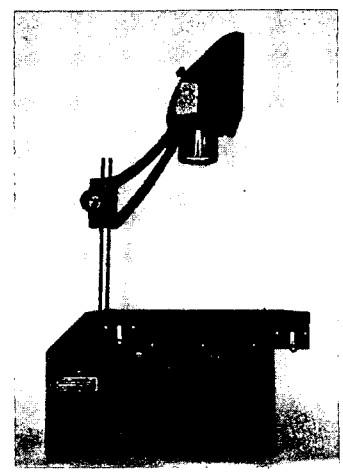
OPAQUE PROJECTOR



SLIDE PROJECTOR



MOTION PICTURE PROJECTOR



OVERHEAD PROJECTOR

Figure 51. Projectors.

features appearing on the screen by pointing to the materials on the projector itself.

(2) Negative transparencies are easily constructed, appear brighter on the screen, are easier on the students' eyes, can be colored by the instructor with acetate and India inks, and are relatively inexpensive.

(3) By use of the acetate roller attachment and grease pencils, the instructor can design his own situations.

(4) A wide variety of transparencies are available through service schools, training aid centers, and audio-visual communication centers.

(5) With the polarizing spinner attachment to the overhead projector and specially treated acetate transparencies, the illusion of motion can be achieved. This is especially valuable demonstrating the flow of electricity, rotation of cylinders, flow of oil in engine blocks, rotation of gears, and many other motions.

l. The Opaque Projector.

(1) The opaque projector (fig. 51) is used to project on a wall or screen illustrative material from textbooks, field manuals, magazines, newspapers, technical material, and other printed material. All features that are highlighted in color or special print will appear on the screen in the same manner.

(2) This projector is effective in assisting the instructor in fabricating various training aids. For example, the outline of actual equipment can be drawn on a piece of cardboard, chalkboard, or wrapping paper by merely placing the illustrated or printed material in position at the bottom of the projector, turning on the projector light, and tracing the outline.

(3) Material can be projected in actual size by moving the projector rearward until the desired size is obtained. This technique is also effective for enlarging maps.

(4) A disadvantage of using the opaque projector is that the room has to be completely darkened, thus students are unable to take notes, and the instructor has difficulty observing class or individual reactions.

m. The 35-mm Projector (fig. 51). 35-mm slides are effective and inexpensive to use. The instructor can use 35-mm slides from private collections, order 35-mm slides from commercial agencies, or take the pictures himself. 35-mm color slides can be shown in conjunction with transparencies or actual equipment to add emphasis to instruction.

n. Sand Tables. The sand table is an effective aid in depicting tactical situations, formations, control measures, and historical combat examples. By using sponges dipped in green paint to portray vegetation, and blue water color for lakes and rivers, by bending welding rods into correct symbols, by adding miniature tanks and cannons, and by using ribbons to portray control measures, a realistic situation can be developed at little cost. By wetting and remolding the sand, a variety of problems can be projected, thus reducing repetition.

o. Flourescent Paint and Chalk. Special effects may be produced by using flourescent material in conjunction with black-light. This light causes the flourescent material to glow. For charts, Venetian blind strips, chalkboard problems, and displays, this is an effective method of emphasizing and vitalizing subject material.

38. Fabrication of Training Aids

There are many simple devices that the instructor can use to produce his own aids when time is limited, new ideas are developed on the spur of the moment, or training aids are not available. Articles available for construction of aids are—

a. Felt-tip ink pens for printing Venetian blind strips, drawings, and charts.

b. Lettering guides for printing.

c. Grease pencils and artist pens for draw-

ings, printing, charts, and use on acetate transparencies.

d. Salvaged materials. For example, worn tentage can be used to teach canvas inspection, and ordnance salvage can be used to show ruptured or bent cartridges.

e. Tape and phono recordings: By using recordings, an instructor can add drama, interest, and variety to his instruction. Recording equipment is available from Army audio-visual communication centers. DA Pam 108–1 contains a listing of prepared tapes and phono recordings.

f. Colored cardboard and paper, colored chalks, paints, and inks and pencils are all available to add color to any chart or display.

CHAPTER 8

THE DEMONSTRATION

39. Importance of the Demonstration

The objective of virtually all military instruction is to train the soldier to do. Because of this emphasis on doing, Army instructors must *show* as well as tell. They must provide demonstration in the presentation stage to give the students a pattern for doing and to set standards of performance (fig. 52).

a. The effectiveness of the demonstration lies in its appeal to several senses. Generally, its appeal is to the sense of sight, which is the most valuable of the senses for stimulating learning. The demonstration also stimulates a high degree of student interest.

b. Whether or not these advantages of the demonstration are realized depends upon the instructor's planning and presentation. For Army instructors to use the demonstration method effectively, they must understand—

(1) For what purposes the demonstration can be used.

(2) The forms that the demonstration may take.

(3) The techniques that should be followed in planning and conducting a demonstration.

40. Purpose of the Demonstration

The demonstration is not a separate teaching method, but one to be used in combination with

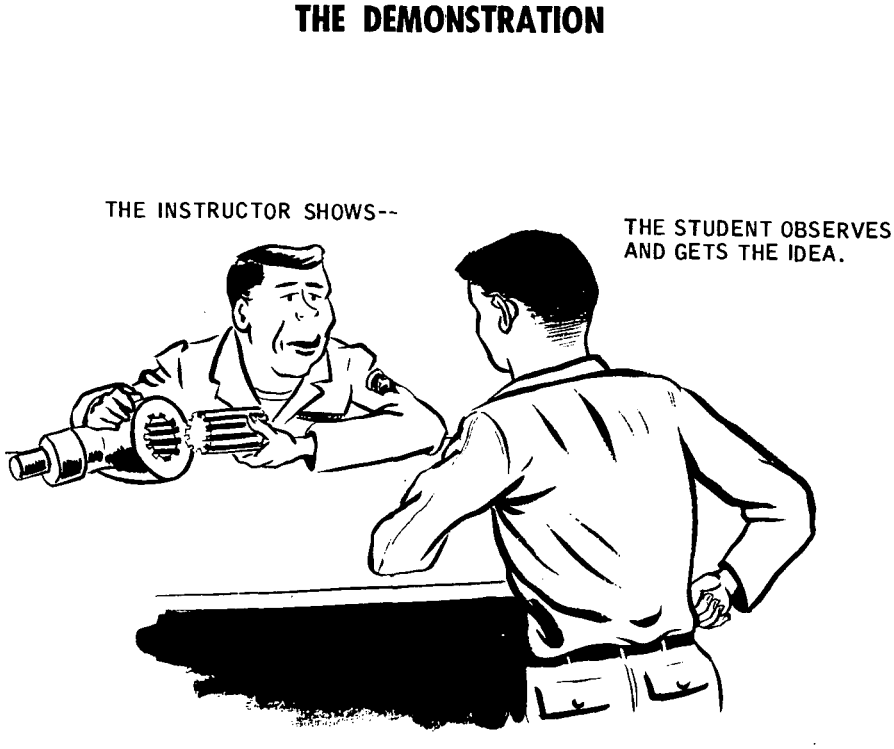


Figure 52. The demonstration.

others. It is usually preceded and accompanied by an explanation employing either the lecture or the conference method, or both. When the demonstration is used to teach skills or techniques, it should be followed by practical work. Although the demonstration is most commonly considered an introductory method of teaching skills and techniques, it can also be used for other purposes. The demonstration is effective in teaching—

a. How To Do Something. Skills are physical or mental acts performed with dexterity. They are acquired and improved by accurate, repeated practice. In training to develop skills, the demonstration serves to establish for the student a visual image of how it should be done (fig. 53). A demonstration that sets out to show the right way of doing a thing must be perfect in every necessary detail. Each step must be demonstrated slowly, so that the students will grasp it thoroughly. Such military skills as the disassembly of weapons consist of a series of complicated movements and must be divided into individual steps or subtasks. Each step must be demonstrated separately and then performed by the students before going on to the next. It may be necessary to repeat each step several times to insure student understanding. Instructors must remember that even the best students remember only a few images at a time; therefore, the number of steps demonstrated at one time might be limited.

Figure 53. Demonstration of how something is done.

b. Why it Works. An understanding of certain basic principles and theories is essential to the successful performance of the work involved in most technical fields. The demonstration can be used to develop this understanding (fig. 54).

c. How it Works. For example, in teaching the machinegun, the instructor may demonstrate functioning by using an enlarged cutaway model, a training film, or closed circuit TV presentation that reveals the movements of the component parts (fig. 55).

d. The Way it is Executed. Here the demonstration is used to teach how to apply skill and knowledge to solutions of factual problems (fig. 56). The sand table or chalkboard may be used, or actual tactical manuevers may be conducted in the field. In this way standards and procedures are established. Showing what the whole activity looks like when skillfully performed creates interest and an appreciation of ultimate standards.

e. How Men Work Together. This type demonstration often takes the form of a skit or prepared exhibit. The operation of a message center, staff procedures, and other such activities can be taught by means of demonstration. Procedures taught in this manner are realistic and specific in showing each man what he should do in his job (fig. 57).

f. Appreciations. A smooth, efficient demonstration will produce within the students an

Figure 54. Demonstration of theory and principle.

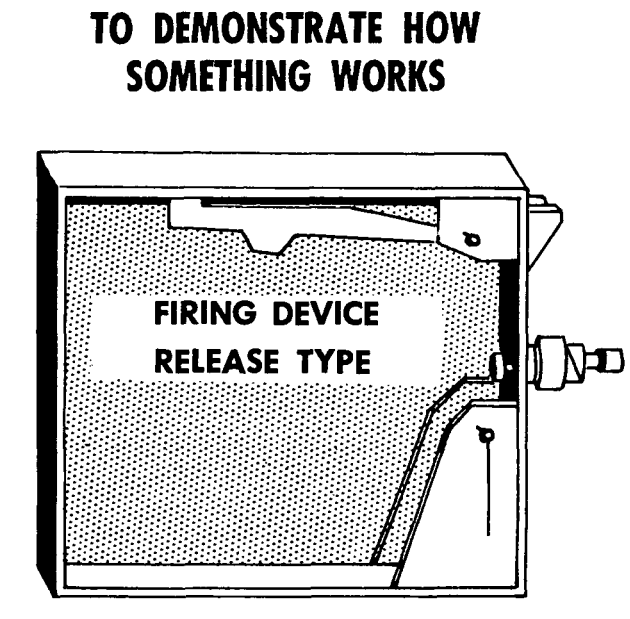


Figure 55. Demonstration of how something works.

appreciation of the skill or technique being demonstrated (fig. 58).

41. Forms of the Demonstration

There are five general forms of the demonstration (fig. 59).

a. Procedural Demonstrations. This is the form of demonstration used to show and explain operation and functioning of equipment. It is usually conducted in the classroom and is widely used throughout basic and specialist training.

b. Displays. The displayed materials should be arranged so that each item can be seen by all students at the same time. For large classes, use duplicate displays or divide the class into sections, the sections rotating from one exhibit to another.

c. Field Demonstrations. This form of demonstration is used widely in combat training. Complicated demonstrations can be shown one part at a time; later, the complete performance can be shown. One phase must be properly assimilated before the next phase claims the students' attention.

d. Motion Pictures. Training films or television presentations are ready-made demon-

Figure 56. Demonstration of tactical movements.

strations. Here the student has the opportunity to see internal workings of equipment, or troops in combat—things that could otherwise only be imagined.

e. Skits. Instructors or assistants may act out operations or procedures. This form of demonstration has proved an effective means of demonstrating staff procedures, phases of first aid, military courtesy, and similar subjects. Skits assist in the development of student appreciations and attitudes. Skits may be designed to show the *wrong* way; however, the instructor must insure that the *right* way is obvious, or show the correct way later. Skits must be carefully planned and smoothly presented; this requires repeated rehearsals.

42. Planning and Conducting a Demonstration

The physical setup for a demonstration requires special attention. It is necessary to arrange for use of equipment, tools, and related materials. If students are to perform the operation following the demonstration, arrangements must be made for conducting the practical work. Observe the following points:

a. Plan the Details of the Demonstration Carefully. Careful planning of the following is essential for an effective demonstration:

(1) Arrange all tools and equipment to eliminate any loss of time. If they are to be moved in during the demonstration, arrange them so that they can be moved quickly and quietly.

(2) Make sure that all students can see and hear. Consider the size of the class, the equipment to be used, and the length of the demonstration. If equipment noise makes it impossible

TO DEMONSTRATE
HOW MEN WORK TOGETHER

Figure 57. Demonstration of procedures.

for the students to hear, do not talk until the noise has subsided.

(3) Have lesson plan available to insure that the accepted technique of performing the operation is followed. This, in turn, will promote the development of exact habits and techniques in the students.

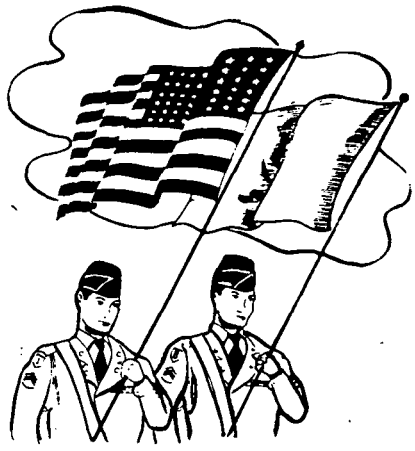
(4) Keep a specific purpose in mind. Demonstrate one thing at a time. Students should be able to recognize distinct breaks between the phases or steps of the activity being demonstrated. If it is necessary for students to learn more than one way of performing an operation, a separate and distinct demonstration should be given for each method to be taught.

b. Be Alert to Needs of the Class.

(1) Be sure students can see. Position yourself to one side, or behind the piece of equipment, so as not to obstruct the view. Repeat a performance as often as necessary to insure that all students have seen it completed.

(2) During a demonstration, you obviously want the student to watch the demonstration and also listen to the explanation. If you are demonstrating an item of equipment, speak to the stu-

TO DEVELOP APPRECIATION



1. MUST APPEAL TO THE UNTRAINED
2. MUST BE SKILLFULLY PRESENTED

Figure 58. Demonstration to develop appreciations.

dents, not to the equipment. If you are explaining while an assistant instructor demonstrates the equipment, direct the students' attention to the demonstrator. It is not uncommon for students to watch an instructor and fail to realize that an assistant instructor is demonstrating the steps of the operation.

(3) Check frequently to make sure that all students understand. At the conclusion of each major step in an operation, ask questions to verify student understanding.

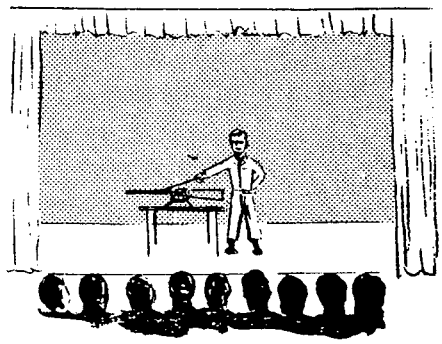
(4) Encourage students to ask questions at frequent intervals, but only between major steps of the operation. Students generally should not be allowed to interrupt the demonstration of a step.

(5) When equipment is being used in a demonstration, have available additional training aids that may be helpful. For example, a large chart or model is valuable to show how to make fine adjustments on a small item. Cutaway models may be used to show the adjustment of parts concealed by a covering or housing. In demonstrations consisting of several steps or phases, list each step, as it is performed, on a chart or chalkboard. This helps the students remember the steps in proper sequence.

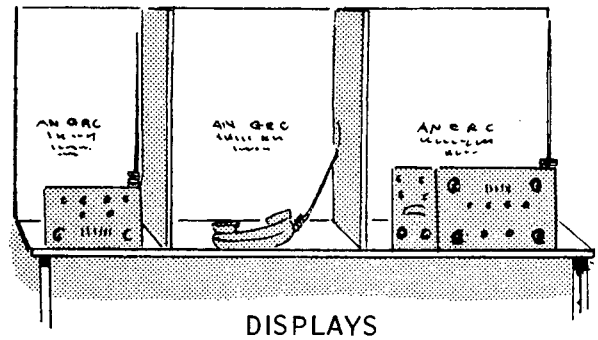
(6) Use a summary at the completion of a demonstration. This summary should include an enumeration of all steps in the order in which they were demonstrated. Brief summaries should also be used after each individual step.

c. Coordinate the Explanation and Demonstration. Show how and explain how at the same time. Immediately before each step, tell exactly what you are going to do next. During the step, explain what is being done, and indicate why the step must be performed in a particular manner. Time explanations so that only short pauses occur between remarks. Eliminate awkward gaps. The interest and attention of the class are diverted when a delay occurs, for example, in bringing in an item of equipment. Effective use of assistants will help in this regard. Rehearse the demonstration to check procedures and to insure that every instrument or piece of equipment will function properly. Students lose confidence in instructors who experience difficulty; too, blunders are distracting. If the demonstration contains a particularly difficult step, acquaint the students with this fact before beginning the operation, requesting their close attention; then, if something goes wrong with the demonstration, you can capitalize on it.

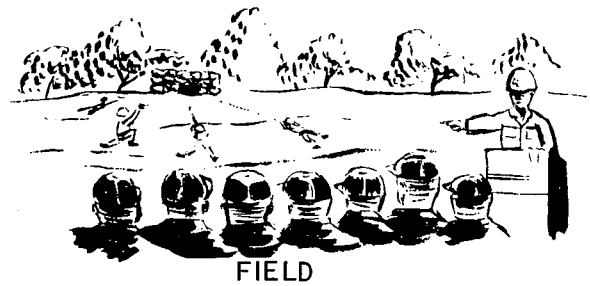
d. Emphasize Safety Precautions. General safety precautions, rules, and regulations should be taught early in the training program. These should be reiterated and specific precautions should be pointed out during demonstrations.



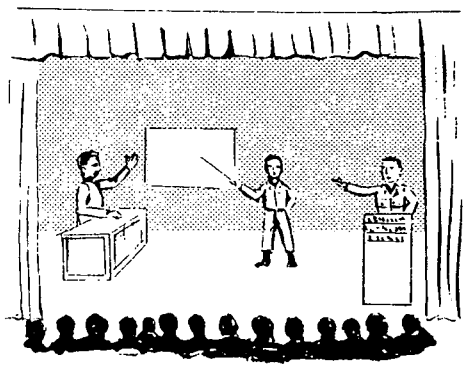
PROCEDURAL
DEMONSTRATIONS



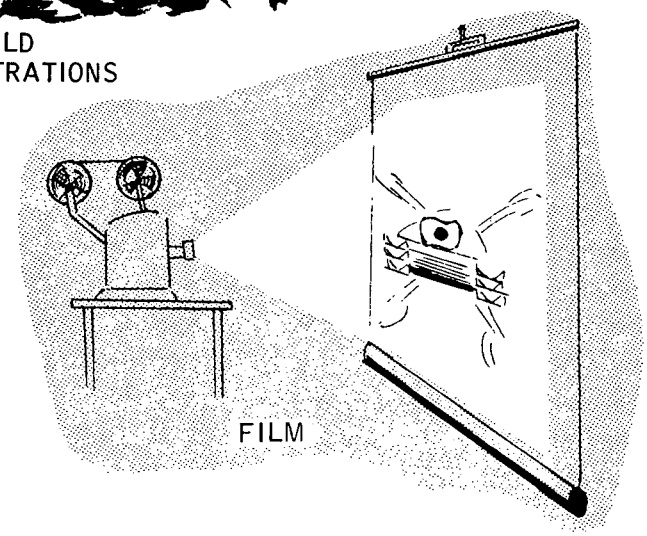
DISPLAYS



FIELD
DEMONSTRATIONS



SKITS



FILM

Figure 59. Forms of the demonstration.

CHAPTER 9

APPLICATION

43. Importance of Application

a. Practically all military training emphasizes *doing*. In most training programs at least 65 percent of the instruction will be applicatory (fig. 60). Army instructors must understand and be able to use the various methods of applicatory training.

b. An instructor must first understand how a man learns to do something, in other words, the basic steps of learning that are involved in acquiring a skill. There are basic methods that are used in applicatory training, and the military instructor must understand what they are, how each works, and when to use the appropriate method.

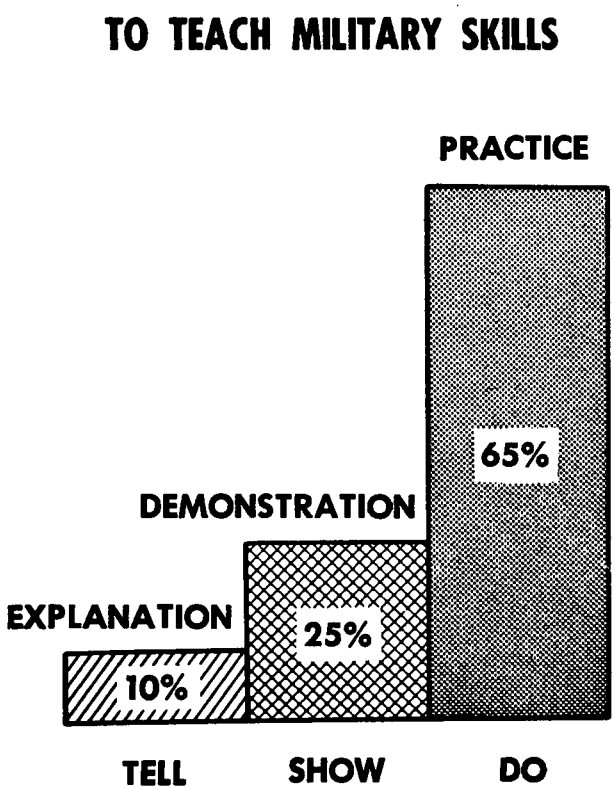


Figure 60. Teaching military skills.

c. Application of military knowledge cannot be left to chance. The instructor must understand the general considerations for planning and conducting practical work. It is this type of learning that pays off in the training of a soldier who can do the job.

44. Opportunities for Application

Opportunities for application can be found in most Army instruction. For example, through application—

a. Soldiers can learn to inspect and use tools, weapons, and equipment, and to perform close and extended order drill.

b. Personnel can be taught movement under enemy observation or fire, scouting techniques, terrain sketching, and use of the compass.

c. Supply clerks can fill out requisitions, reports of survey, shipping forms, and bills of lading.

d. Administrative clerks can be given problems relating to morning reports and service records.

e. Men can learn procedures to be used when a gun stoppage occurs, the effect of wind on sight adjustments, and the construction of strip maps and circuit diagrams.

f. Men can work problems involving the mil relation, practice initial fire commands, and participate in extensive map exercises.

45. Application in the Teaching Process

a. Active participation by the students throughout the lesson is highly desirable. Instead of relying consistently upon separate practical work periods that follow explanations and demonstrations, the instructor may consider an integrated explanation, demonstration,

and application to each step in teaching a skill or procedure. The nature of the skill and the actual situation will dictate the appropriate technique and the sequence of applicatory methods. (See para 47 for a discussion of methods of application.)

b. Instructors must realize the importance of classroom "pencil-and-paper" exercises in addition to the conventional practical work periods. The adapability of these exercises for many military subjects is often overlooked.

46. Learning Skills and Techniques

In the application stage, soldiers develop physical or mental skills and techniques, or learn how to solve problems.

a. Learning a Skill. Three basic steps are involved in acquiring a skill (fig. 61).

(1) Building a concept of the skill—learning of what the skill consists. This is usually accomplished by:
   (*a*) Demonstration.
   (*b*) Explanation.
   (c) Directing students to other information, such as study assignments, instructional sheets, and similar references.

(2) Developing the skill.
   (*a*) The student imitates the demonstration.
   (*b*) His activities are directed.
   (*c*) The instructor evaluates progress and encourages the student to evaluate his own progress.

(3) Practicing for accuracy, speed, and making the act or procedure automatic.

b. Problem Solving. The primary objective in developing problem solving techniques is to teach how to solve problems rather than how to arrive at approved solutions. The student should use a thought process similar to that used in the estimate of the situation. Briefly, this process is—

(1) Recognize the problem.
(2) Assemble data bearing on the problem.
(3) Determine possible solutions.
(4) Evaluate the possible solutions.
(5) Accept the best solution as the course of action.

47. Basic Methods Used in the Application

There are several methods of employing application. The best method to use depends on the state of training and the skill being learned.

a. Controlled Practice Method.

(1) In controlled practice (fig. 62) all men in a class do the same thing, at the same rate, and at the same time, under the supervision of instructors. The steps in this method are—
   (*a*) Explain and demonstrate a step in the procedure while students observe.
   (*b*) Lead the students through an imitation of the demonstrated step. Make on-the-spot corrections.

(2) This procedure is applied to each step until the operation is covered completely. Initial application in most skills and operations, such as the disassembly of weapons, should be taught by the controlled practice method.

(3) Controlled practice affords maximum control and observation of student activities, facilitating on-the-spot correction of errors in the imitation step. Clear directions are essential; for example, at the beginning of a lesson on the disassembly of a weapon, the instructor should tell the class that—
   (*a*) He will explain and demonstrate step by step the process of disassembly.
   (*b*) Students are to give careful attention to the explanation and demonstration.
   (*c*) Students are not to perform the step until after the explanation and demonstration and then only when the entire class is told to start.
   (*d*) Students are to perform only the step demonstrated and are at no time to get ahead of the instruction.

(4) Controlled practice is especially suited to the first two steps in learning a skill, gaining the concept and imitat-

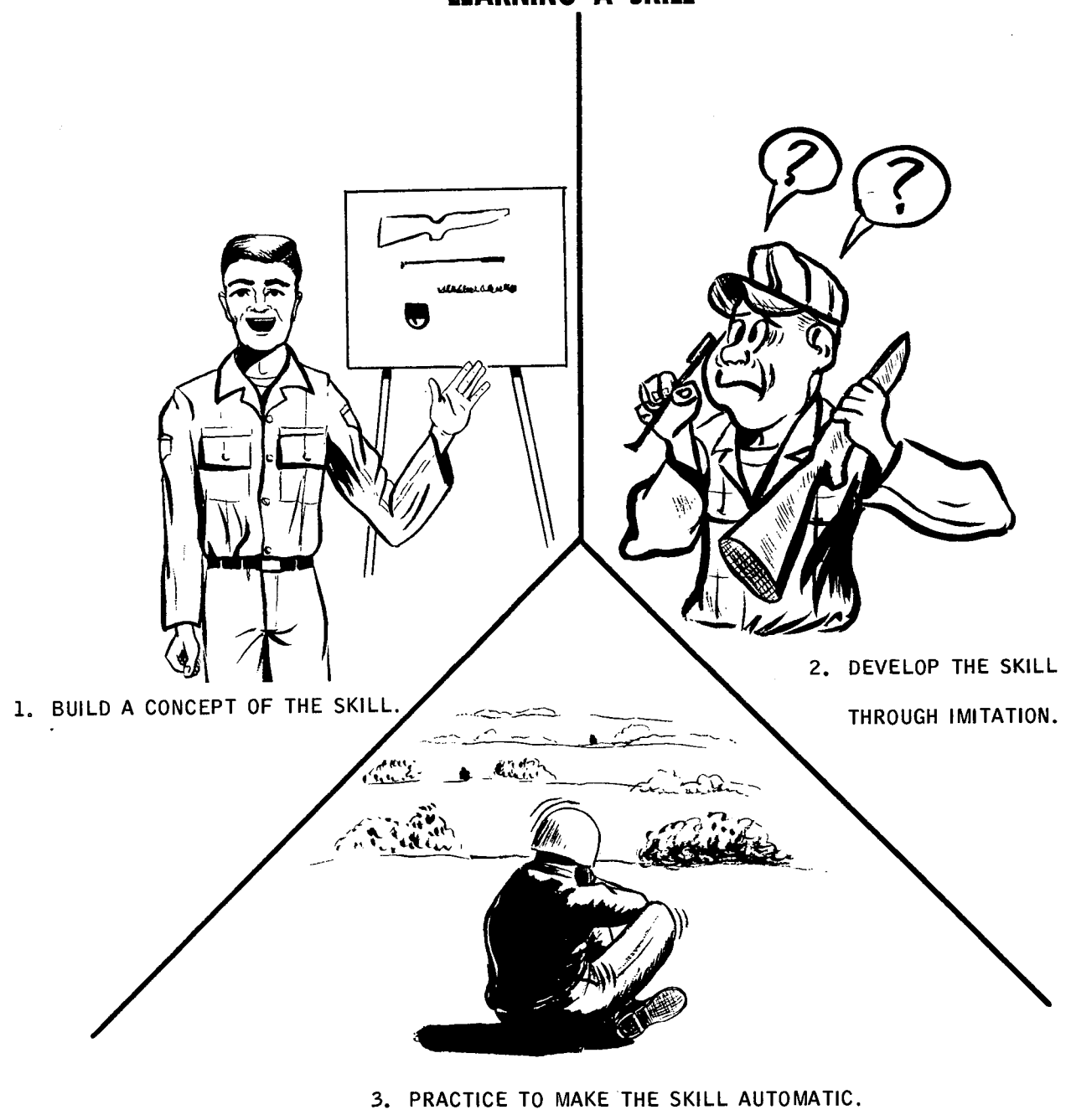


Figure 61. Steps in learning a skill.

ing the movement pattern. The last step—making the skill automatic—must be carried on by a method that does not limit the student—independent practice.

b. Independent Practice Method. The student works at his own rate of speed without control but with supervision to perform an operation as a whole (fig. 63). Through independent practice he can establish the skill so that it becomes automatic.

c. Coach-and-Pupil Method. This method (fig. 64) is used for teaching students who have acquired the fundamentals of a skill. Students are paired off and act alternately as coach and pupil under direction and supervision of the

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1. EXPLANATION AND DEMONSTRATION.
2. IMITATION AND ON-THE-SPOT CORRECTION.

Figure 62. Controlled practice method.

1. WORK AT OWN SPEED.
2. PRACTICE TO PERFECT AND MAKE AUTOMATIC.
3. INSTRUCTOR SUPERVISES AND CORRECTS ERRORS.

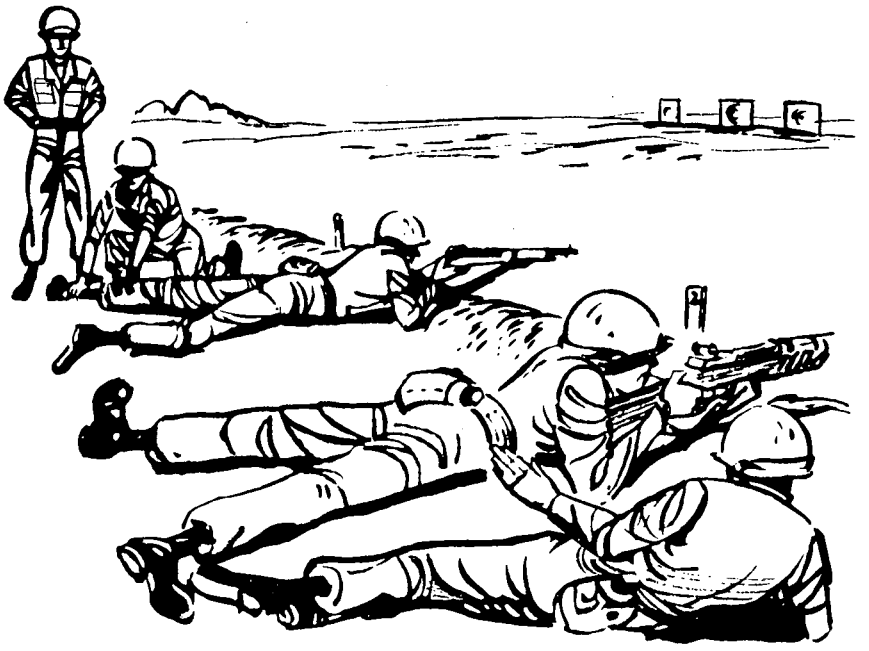
Figure 63. Independent practice method.

instructor and his assistants. This method causes students to think as well as do; it develops initiative and self-reliance in performing military skills. It lends itself to the teaching of such subjects as bayonet practice, unarmed defense, first aid, and marksmanship.

d. Team Practice. In the application stage the student should be trained first as an individual and then as part of a team such as a tank crew, a rifle squad, or the crew of a crew-served weapon. Team practice exercises (fig. 65), in which students serve as team members, normally are conducted in two phases: first, a walk-through-by-the-numbers practice in which techniques are emphasized; second, opportunities to apply these techniques in a realistic situation.

(1) *First phase.* In the walk-through-by-the-numbers phase, only team fundamentals should be stressed. The introduction of simulated battle conditions too early tends to obscure the learning of fundamentals. Instructors make on-the-spot corrections.

(2) *Tactical phase.* As teams master the fundamentals, the applicatory exercises should be expanded in scope to include all phases of combat operations. A variety of individual subjects should be fitted together into a single training period; conditions and requirements should be varied so that team members develop judgment and facility in applying skills and techniques to solutions of new and varied tactical problems.



1. STUDENT UNDERSTANDS FUNDAMENTALS.
2. PUPILS PERFORM THE SKILL.
3. COACHES CORRECT ERRORS.
4. INSTRUCTOR SUPERVISES.

Figure 64. Coach-and-pupil method.

48. General Considerations for Applicatory Training

Knowledge of the general considerations in planning and conducting all types of application enable the instructor to anticipate many problems and plan a more effective application stage (fig. 66).

a. Students Must Be Motivated to Learn. Learning will result in the application stage if understanding of the materials taught is developed by effective instructional techniques in the presentation stage, and if students are motivated to put these materials into practice. Motivation, in the application stage, can be accomplished by—

(1) *Setting definite objectives.* Be sure that students know what they are to do and why it is important. Be sure that the exercise emphasizes a few simple principles, rather than several complex situations that may confuse the students. State the objective in terms of student behavior rather than subject matter; for example, "today you will learn how to locate your position on a map" will motivate student performance more than "during this period you will learn all about grid coordinates."

(2) *Evaluating progress made.* Knowledge of one's progress is a very effeeffective incentive. At appropriate intervals, inform the student of the quality of his performance. If it is satisfactory, the feeling of accomplishment spurs him to further effort; if it is unsatisfactory, he becomes conscious of the need to do better and will usually strive to improve his record. Judicious praise stimulates the learner, but commendation should not be used to the extent that it becomes ineffective.

Figure 65. Team practice method.

(3) *Using competition.* In application there are many opportunities for the use of competition. Students may compete against their past records, with each other—individually and in groups, and with standards set by instructors. Competition, properly conducted, will motivate students to wholehearted effort.

(4) *Varying procedures.* One of the best ways to maintain student interest during a long period of practical work is to vary the procedures. As an example, in teaching battle drill have students occupy different roles of platoon leader, squad leader, fire team leader, etc.

(5) *Making application realistic.* Strive for realism whenever the activity is such that realism is important. This motivation technique is best used in team performance activities. Some individual types of application, such as use of the compass, preparing individual field fortifications, and tactical training of the individual soldier, make wide use of realism to motivate learning.

b. Insure That Practice Does Make Perfect. Soldiers will do in combat about the same things they do in training; their performance must be perfected in the practical exercises of the training program. In order to set up applicatory exercises that will enable students to approach perfection, the instructor must—

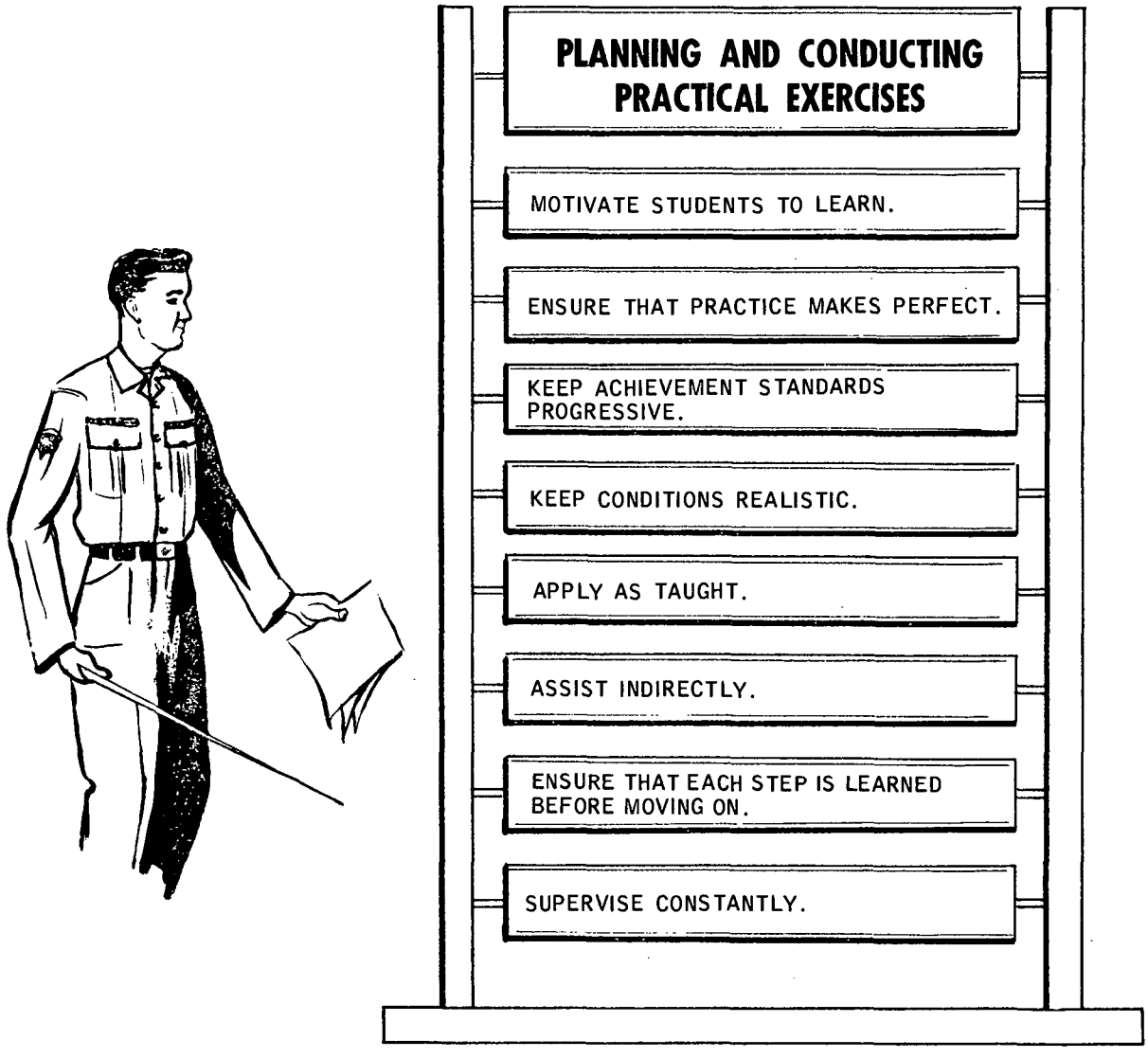


Figure 66. Planning and conducting practical exercises.

(1) *Make a correct start.* The most common procedure for giving the learner a correct start is to demonstrate the act to be performed, and then let him practice it. The controlled practice is especially effective in making a correct start.

(2) *Provide practice or drill exercises.* Exercises should provide for repetition. Single out a specific action for isolated practice—for example, the on-guard position in bayonet drill. When a series of specific actions is needed in the performance of an act, exercises for each action should be provided; then these actions should be practiced together in an exercise that closely approximates a real situation. The number of exercises should vary with the difficulty of the response desired.

(3) *Employ problem-solving techniques.* These are especially valuable in team performance exercises and in situations where students have developed some skill through practice. The use of problems will motivate the student and make the instruction more realistic.

c. Keep Achievement Standards Progressive. In initial applicatory exercises, the student should perform each step thoroughly and accurately under close supervision. In succeeding exercises, standards should be raised progressively—better and faster work should be required, and less assistance should be given. Mere repetition of an activity has little value unless higher standards are set. Soldiers should be made aware of the progressive nature of their practical work; otherwise they may feel that the exercise has been designed merely to keep them busy.

d. Keep Conditions Realistic. Keep conditions of the applicatory exercise as nearly as possible like those that would be encountered in battle or other actual use. In the initial exercises, however, it is often more important to provide ideal conditions than to insist on realism, so that students can learn to perform correctly; realistic conditions can be introduced in succeeding exercises.

e. Procedures and Skills Should Be Applied as Taught. Perfection is achieved through practice only if the student practices the right movements and procedures. The instructor must make sure that students practice skills or techniques as they have been taught.

f. Indirect Assistance Is Best. The initiative and resourcefulness so necessary for success in battle can be developed in the application stage only if instructors train men to depend on their own abilities in the solution of problems. Instructors must prevent the formation of faulty habits, but, at the same time, they must encourage soldiers to use their own resourcefulness. After the initial applicatory exercises, most assistance should be indirect.

g. Each Step Must Be Learned Before Moving to the Next. Do not introduce too many operations, procedures, principles, or problems at any one time. Introduce a few learning activities, provide for adequate practice, review and critique the material taught and practiced, and examine the students' work; then, if they are proficient, proceed to the next step.

h. Constant Supervision Is Imperative. The fact that students are busy is not a guarantee that learning is taking place. The instructor must insure that he can give affirmative answers to these questions:

(1) Do the students know the what, how, and why of the activity?
(2) Does the activity contribute to the realization of the objective?
(3) Are the students performing according to instructions?
(4) Is maximum use being made of equipment, materials, and personnel?
(5) Are safety measures being observed?
(6) Is ample time provided for completion of the performance?
(7) Are the students constantly improving?

49. The Problem Exercise

a. General. The problem exercise employs the problem-solving process, described in paragraph 46*b*, and is used when solutions are based upon the application of principles, techniques, or procedures to the problem situation. Successive situations in a problem exercise may vary from a few minutes to several hours. It may be a simple situation presented orally and followed by questions, or it may be a written exercise. The problem exercise not only provides for learning by doing, but it also places the student in realistic situations facing the problems he will face later in job assignments. By its very nature, a problem stimulates interest and concentration, which are so necessary for learning. Most persons enjoy the challenge of a problem or puzzle in anticipation of success in solving it. It provides valuable student practice in acting and reacting correctly when the need arises, in much the same manner as a rifleman is trained to react automatically under conditions of strain and urgency.

b. Preparing the Exercise. In preparing a problem exercise, follow the basic steps for lesson outlining. Prepare your introduction as for a conference unit of instruction, with special emphasis upon methods to be used—what is to follow, and whether individual or group solutions are desired. Your review should include a critique of student performance. The development or body of the exercise contains the teaching points and the means by which they are applied—situations, requirements, solutions, and discussions of solutions. In plan-

ning for a conference unit of instruction, you prepare thought-provoking questions and consider the likely student answers. In planning a problem exercise, you prepare requirements and situations and consider the likely student solutions you will receive.

(1) *Situation-requirement.* The problem exercise consists of two parts. The first part, or *situation,* details the specific facts of the general or special military situation; the second part, the *requirement,* directs the student to perform certain actions to solve the problem.

(2) *Preparing requirements.* Prepare your requirement first, since it should be directly related to your lesson objectives. A good requirement causes application of a teaching point; it is specific and its solution requires careful thought and analysis. You can gain added realism by wording requirements in the second person and by using the present or future tense.

(3) *Preparing situations.* Prepare situations to set the stage for your problems. Since you have already prepared your requirement, you must first isolate the factors necessary to solve the requirement. For example, what is the present tactical situation, the organization's mission, and the outlook for the future based upon enemy information? Will terrain and weather affect the problem? How many rounds of each type of ammunition remain in each unit? . . . in the supply and maintenance area? What is the available supply rate? In isolating necessary information, solve the problem yourself to insure that you have included all information necessary for the solution. Check your solution with your fellow instructors to insure that all factors have been considered. Make note of the specific reference data needed, if appropriate, and decide whether to refer students to specific reference tables. After you have determined the information necessary to solve the problem, state the situation clearly, concisely, and as realistically as possible. Insure that the situation actually poses a problem, based upon your knowledge of student background. In the situation, avoid statements that make the solution obvious or restrict the student to only one possible solution. If the requirement does not provide a challenge to the student, it is too elementary; revise it.

(4) *Good problems.* A good problem is challenging in itself. Do not include unnecessary information to lead the student astray or to force him to waste time on matters not related to the lesson objective.

(5) *Solutions.* Provision for discussion of a solution is a critical stage in your preparation, for here is the climax of student learning. You must give careful consideration to *all* reasonable solutions. Prepare analyses of the most likely student solutions. In your analyses, consider the effectiveness with which appropriate principles are applied. Explain why the preferred solution was selected. When situations and requirements are presented in written handout form, the solution and the discussion thereof are included as the first portion of the handout containing the subsequent situation and requirement.

c. Conducting a Problem Exercise. Here are some suggestions for conducting a problem exercise—

(1) Present the situation and the requirement. A variety of techniques are available in presenting problems to students. The printed handout is the most commonly used technique; in fact, it may be used too often. For simple problem exercises, an oral presentation of the problem can keep

the exercise fast moving and more interesting. You can also obtain more interest by using skits, films, recordings, slides, map and terrain models, and actual equipment, either by themselves or in conjunction with printed handouts or oral presentation. Films are currently available for presentation of problems in leadership. Oral presentation of the situation forces the student to make brief notes and trains him to listen critically.

(2) Have students solve the requirement. Circulate among students as they work on the problem, and help those who require assistance. Observe student solutions and select several representative solutions for the discussion that will follow.

(3) Discuss student solutions. Have a student present his solution. Be sure that the entire class can hear him. Using conference techniques, develop a discussion of several solutions in turn. If possible, select students to present important variations from the preferred solution, followed by a student solution that approximates the preferred solution. Develop from the student the reasons why he chose his particular solution. To encourage forward thinking, give credit for all sound solutions, or the portions thereof that represent sound application of principles. Evaluate solutions by these criteria: Will it do the job? Can it be be done this way with the means available? Are the consequences acceptable? In simple problems, with brief solutions not requiring the use of visual aids, students may present their solutions orally "in place." For more lengthy solutions, especially in map or terrain exercises, students will present their solutions more effectively before the class. Appropriate aids should be provided students for these presentations. The technique of having students present their solutions by acting out roles has been used effectively in leadership instruction.

CHAPTER 10

PROGRAMED INSTRUCTION

50. General

a. An ideal teaching situation is one in which there is one qualified instructor for each student. In such a situation, the instructor can concentrate entirely on developing the knowledge and skill of his student; he can guide him step by step through the lesson, ask questions each step of the way, confirm the student's answers immediately, and allow the student to learn at his own pace. Most importantly, the instructor can control the learning process to insure that the student performs the desired tasks correctly. Of course, a one-to-one ratio of instructors to students is seldom possible, particularly when many students must be taught with a limited schedule. *Programed instruction* permits a student to learn a job by himself, at his own pace, and with little or no supervision by an instructor. This method simulates the one-to-one ratio and for many learning situations it is more effective than conventional methods.

b. The purpose of this chapter is make the Army instructor aware of the basic characteristics and types of programs, the general procedure for preparing programs, and considerations in the application and administration of programed instruction. Instructors can become proficient programers by additional study, research, training, and experience.

51. Basic Characteristics

Programed learning is a method of instruction that usually takes the form of a special type textbook called a *programed text* or *self-tutor text*. The material in the text consists of a series of carefully planned and sequenced items, or steps, called *frames*, each of which teaches an increment of information and requires the student to respond to a question or problem involving that increment of information. Not only must the student read the information, but he must also *actively participate* by responding to each frame. The program guides him to respond by constructing and writing his own answers, by choosing answers to questions, by labelling parts of a diagram, or even by assembling a device or an electrical circuit. Immediately after each response, the program confirms the response as being correct or incorrect. Although the program gives sufficient help in each series of frames to insure that the student responds correctly, it is designed to gradually withdraw the help and put the student on his own. Unlike conventional methods of instruction, the student learns at his own pace; he is neither held back nor forced to speed up to keep in step with his classmates. Listed below are the most important characteristics of programed learning.

a. Step by Step learning.

b. Active student participation.

c. Immediate knowledge of results.

d. Low error rate.

e. Self-pacing.

52. Types of Programs

Programs are generally classified under two main types, depending upon how the student responds to the frames and the sequence of the frames.

a. Linear Type. In this type of program, the student reads an increment of information and is then directed to make a response. He may have to respond by writing a single word or a complete sentence, by labelling parts of a diagram, by setting switches on a device, or by measuring some value with a testing device.

Immediately following his response, he checks his answer against the one given either just below the item or on the back of the page. After checking his answer, the student goes on to the next frame and follows this fixed sequence throughout the complete program. Figures 67 and 68 show sequences from linear type programs. Figure 67 is a series of frames taken from a program that teaches the use of a multimeter (a device for measuring electrical quantities). Notice that the first frame (25) presents a bit of information followed by a fill-in type response. Notice that succeeding items gradually develop the student's learning by giving him more examples of the concept and by making him respond to the most relevant points of the lesson. Figure 68 is another example of a linear sequence, which teaches a student how to read a schematic diagram.

b. Branching Type. In this type of program, each item usually contains larger bits of information than those in the linear type. The term branching applies because the sequence of frames varies according to the responses of the student (fig. 69). Multiple choice questions are used not only to test whether the student has learned the information, but also to diagnose any misconceptions indicated when the student fails to answer correctly. Notice that next to each multiple choice answer is a page number that directs the student to the next page of information he is to read. A correct answer usually earns the student a compliment for alertness, and he is then given additional information. A wrong answer leads him to remedial information; after this he is usually directed to return to the original page to select another answer.

53. Planning and Writing the Program

Use programed learning when you are convinced that it can do a better instructional job than conventional methods. Determining which method is most effective requires a careful evaluation of numerous factors, such as student population, number of qualified instructors available for the particular lesson, objectives of the lesson, subject matter, time and, certainly, the comparative costs of the various methods of instruction. After you critically examine these factors and decide that programed learning is the most efficient method, you must plan the lesson, write the program, and, finally, try out the program.

a. Planning the Program. This requires a careful and critical analysis of the job to be taught. You cannot write a single frame until you have completed this analysis, which includes defining the job or skill, determining competence required after instruction, constructing a criterion test, listing job aids; identifying the student, analyzing the components of the job or skill, and stating the specific objectives.

b. Writing the Program. Here is where you teach. This may actually require less work than that required to analyze the task to be taught to the student. In this step, you construct sequences or frames that teach and guide the student to perform the desired job or skill.

c. Conducting Student Trials. Here you are trying to find out how well the program teaches. This phase measures the effectiveness of the program and indicates what specific revisions are necessary to make the program a better "teacher."

54. Steps in Planning the Program

a. Defining Job or Skill. Think of what the student is doing when he is on the job. Describe his activity or operation. This is the objective the program will meet—terminal behavior. The program will have met its objective if the students are able to perform the job you have described. However, it is not sufficient merely to state the program objective in such general terms. Further analysis will be required, as outlined in *f* below.

b. Determining Competence Required. Think of the degree of accuracy or speed required. Consider any time limit. This is required as a guide to writing frames later on. The programer will need to know how extensively and intensively the program will cover a topic. It is a question of knowing what scope and emphasis will pertain to each part of the program. The decision made here will have a far-reaching effect on the way the program is written.

c. Constructing a Criterion Test. Here you want test items to cover all essential aspects of

the job. The test should be such that successful completion indicates acceptable job competence. After a student completes his training, he should be able to pass this test. Test items should be a test of each stated objective.

d. Listing Job Aids. List tools, books, and diagrams normally used. Consider if the student must be able to perform without them.

e. Identifying the Student. Here you determine the prerequisites for the course. Describe what the student should know in order to take the program. Do this in terms of what previous training he should have had, what tests he must pass, what aptitude or achievement scores he must have attained—in short, what identifiable or measurable qualities he must have. Of course, this implies that you have some control over which students should take the program. But even if you do not, it is still important that you have in mind (but preferably on paper) what kind of student you are writing for. Such knowledge will govern, among other things, your approach to the student, your style, your vocabulary, and your degree of repetition.

f. Analyzing the Components of Job or Skill. Look on this as a diligent search for the implied abilities and operations required in doing the job. If the job is soldering electronic equipment, some implications are that the student must be able to tin a soldering iron, hold it properly, and distinguish between a poorly soldered joint and a well-soldered joint. Be sure to include negative aspects such as "poorly soldered." These implications can be called sub-objectives or *implied objectives.* If you can set them down in logical order at this time, do so, by reviewing in your mind the job as it is actually performed. What you are striving for is a breakdown of the job components that will give you one objective for each achievement unit (i.e., from 5 to 10 frames). At this stage you have what amounts to a sentence outline. For a useful format, use complete sentences and specific statements. For example:

(1) Student calculates $I = E/R$ when given values of E and R (*not* "Student knows Ohm's law").

(2) Student selects the proper flux for soldering printed circuits (*not* "Student knows about flux").

(3) Student identifies all operating controls on Radio Set _____ (*not* "Student knows control of Radio Set _____").

(4) Student states that the resonant frequency of a tank circuit depends on the values of L and C (*not* "Student knows the theory of resonant circuits").

(5) Student calculates standard deviation from raw scores (*not* "Student understands standard deviation").

(6) Student measures road distance on map by use of graphic scale (*not* "Student knows how to use graphic scale").

Note. You are still describing the activity (or behavior). You are not specifying *how* the student will learn.

g. Insuring That the Job Components Are Arranged In Some Logical Sequence. Note which activities must precede others on the job. (The program normally would follow this sequence.) This is the stage at which the outline of the program is taking shape. At this time, you also scrutinize the components to see if any can be further subdivided. The more thorough you are at this stage, the easier the actual programing will be, because you will have a detailed scheme of all objectives you wish to reach.

55. Structure of the Program

a. The structures of linear and branching programs differ not only in the size of each step but also in the sequence of steps. Most linear programs require that the student read each frame in the program. Thus, the student follows a single "in-line" instructional path throughout the program. Figure 70 is a sequence diagram that illustrates the instructional path. Because the student is directed through a single path, the program is called a *linear* program. Branching type programs differ in form from the linear type in that they provide the student with two or more paths or branches for each frame; the branch the student takes depends upon the answer he chooses. If he selects the wrong answer, he is directed to a branch that gives him remedial help (fig. 70). A right answer choice will direct him to the main branch of the program. Thus, a branching type program is sometimes called a multiple choice pro-

gram; technically, it is also called an *intrinsic* program, because the student's action determines the path he takes.

b. Each type of program, linear and branching, consists of several series of frames called *criterion units* or *achievement units.* Each unit teaches one of the implied objectives of the program. An average achievement unit in a linear program usually consists of about 5 to 10 frames. Branching programs usually have fewer frames in an achievement unit, but the frames are larger.

c. Each achievement unit (fig. 71) consists of a series of "teaching" frames that develop the student's ability to "master" the skill described in the objective and a final frame that tests the student's ability to perform the skill; the teaching frames are called *lead-up* frames and the final frame is called a *criterion* frame or a *prover* frame.

56. Steps in Writing the Program

a. First, Write Criterion Frames. Write one to correspond to each implied objective. Write this frame so that a successful response will prove or demonstrate that the student has mastered the skill or knowledge you want. These are the "pay-off" or "prover" frames; they may closely resemble the items you wrote as criterion test items. This is the first step in writing the actual program.

b. Next, Write Teaching Frames. This is where you start teaching. Here you write the lead-up frames for each criterion frame. The teaching frames plus the criterion frame constitute an achievement unit—the basic component of a program. You are in a sense backing away from the criterion frame to a point where you feel you can make a beginning. That point is where you made contact with what the student already knows or can do and begin edging him toward the first goal. In the teaching frames you are causing the student to learn in a way that will carry him step by step to the objective you have already determined.

(1) At this stage the student is learning terms and definitions, applying them, discriminating, solving problems, drawing conclusions, making inferences. As these activities accumulate, they form a pattern and become more complex.

(2) These frames must not be haphazardly constructed. They must follow some logical line, and that line should be evident to the student. Ideally, upon reaching the prover frame, the student should be able to retrace the steps by which he came. This is the stage at which the programer's skill will be most taxed, but the degree of difficulty will depend on how well the programer has analyzed the program objective.

(3) Start with the minimum number of teaching frames. Let the actual tests of the program tell you when you have enough; otherwise you have no way of knowing when you have overprogramed.

57. Trying the Program

a. Try out your program after you have completed about 100 frames of a linear program and about 25 frames of a branching program. It is even better to try out one achievement unit at a time. The student taking the program should be encouraged to point out any difficulties as he encounters them. You should take notes on each difficulty so that you will be able to revise intelligently. You will probably be able to make some revisions after even one trial, but often three or more trials will be needed before you can revise efficiently. Of course, each revised version of the program should also be tried out. For the instructor, this may be the most monotonous part of programing, but do not minimize the necessity of this phase; the student trial and revision phase is one of the most important of the entire programing process.

b. Formal field testing and evaluation, using the criterion test, must follow the completion of the program. Revision then, if necessary, must precede overall implementation of the program.

58. Application of Programed Learning

Programed learning can be used to teach almost any subject. The method can teach verbal information such as the theory of electricity and it can even teach the operation and use of de-

vices such as the multimeter, slide rule, or micrometer. Because the programed method is a self-instructional technique, an instructor can issue a program for use in the classroom or for use away from class as a self-study assignment.

a. Use in the Classroom. Many instructors legitimately complain that they do not have enough time to complete their duties as efficiently as they would like. Lack of time for preparation of equipment for demonstrations and practical exercises and for preparation of tests and lesson plans is often a problem. By scheduling programed learning sequences within the lesson plan, along with conventional conferences and demonstrations, the instructor can gain useful time while students use the program. Using programed instruction, the role of the instructor can be shifted from one of "information giver" to that of counselor or leader.

b. Use Away From Class. Obviously, a student away from class does not have an instructor available to help him to review subjects already taught or to prepare for subjects that will be taught. A programed text used for these applications can serve as a private tutor to review or introduce the essential lessons of the course. Programed texts can also be used efficiently as remedial assignments for students who need extra help. They can also be used to accelerate graduation of highly qualified students.

59. Administering Programs in Class

Administering a programed text in a class is as important as administering any other class assignment; the programed phase of the lesson will fail if not administered properly. Here are a few rules to help you to administer programs successfully:

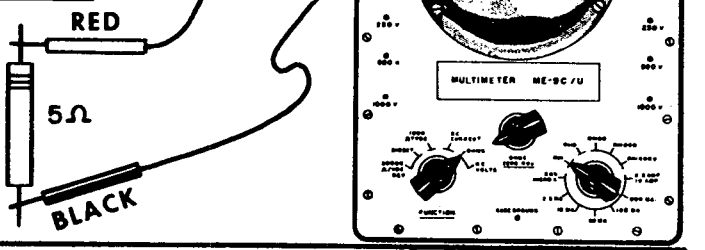
a. Select the Appropriate Program. Programed texts usually are written from a set of specific duty-oriented *objectives* that state exactly what the student will be able to do after he completes the text. Careful study of these objective statements will help you to determine whether the program parallels the desired lesson. The criterion for the instructor is that the program must teach the desired subject as effectively or better than other methods.

b. Know the Contents of the Program. Analyzing the objectives is not enough. You must also carefully read the program to prepare yourself for questions that students may ask about certain subject areas within the program. Knowing the depth of subject matter and how the program treats it will help you to guide the student in the proper use of the program.

c. Tell the Students How to Use the Program. This applies particularly to students who have never used programs. Because the programed format is usually unlike the conventional text format, you must demonstrate how to read and respond to the sequence of frames to prevent confusion and loss of motivation. Do not underestimate the importance of telling the student how to make use of introductions, reviews, summaries, self-tests, and any other information contained in the program.

d. Provide Enrichment Activities for Students Who Complete Programs Early. Because the programed activity is self-paced, some students finish sooner than others. For those who do complete the program early, you should provide enrichment activities that enable them to apply and reinforce what they have learned in the program. The activity may be a demonstration, a practical exercise, a television presentation, or additional programed material on advanced work. Do not provide activities, such as detail work, that imply a penalty for finishing the program early.

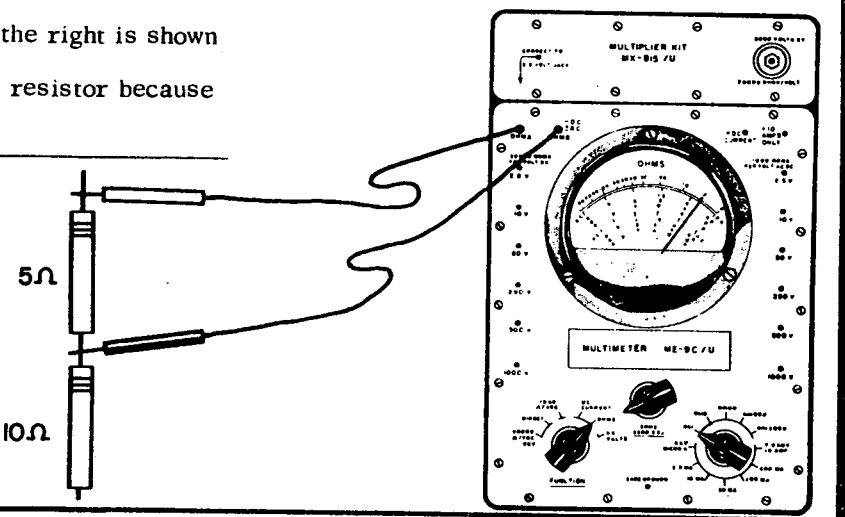
25. To measure resistance you must place the black probe on one end of the resistor and the red probe on the other end. We thus connect the meter across the resistor. In this illustration, the meter is connected _____ a _____ ohm resistor.



25. across;

5

26. The TS-352/U on the right is shown measuring the (5) (10)-ohm resistor because the meter is connected _____ that resistor.

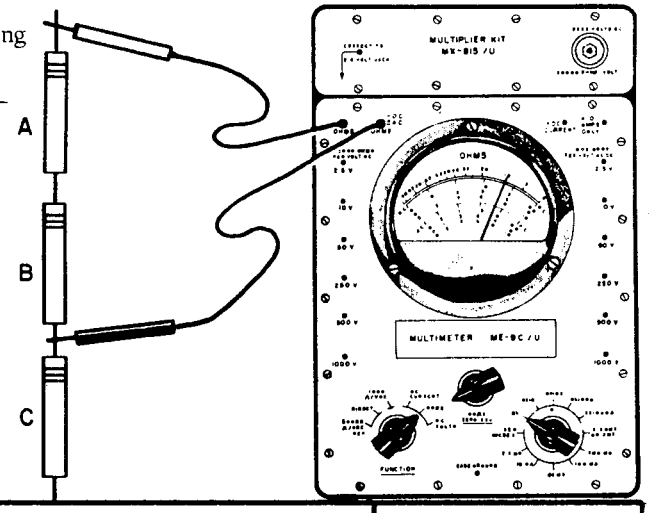


26. 5;

across

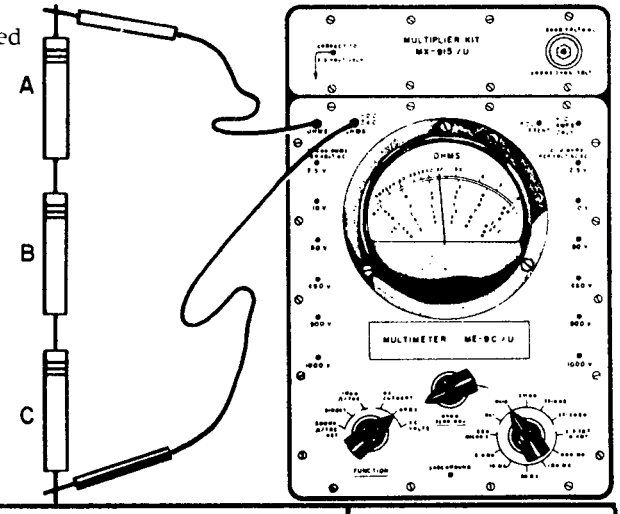
Figure 67. Sample of a linear program.

27. The TS-352/U is shown measuring the total resistance of resistors (A and B) (A, B, and C).



27. A and B

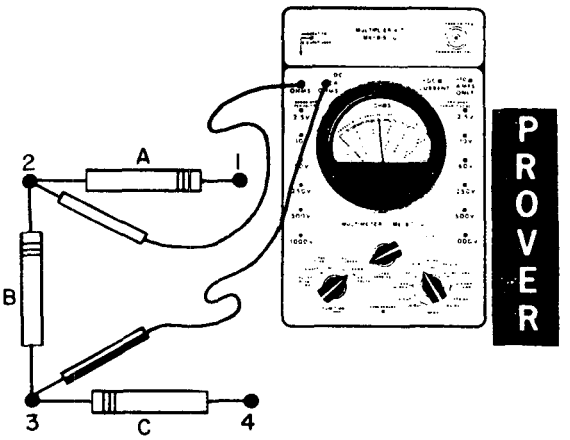
28. Which resistors are being measured in this figure? (A only) (A and B) (B and C) (A, B, and C).



28. A, B, and C

Figure 67—Continued.

*29. The TS-352/U is shown measuring the resistance of resistor (A) (B) (C). To measure resistors A and B together, you would have to connect the probes across terminal numbers _____ and _____ and to measure resistors A, B, and C together, connect probes across terminal numbers _____ and _____.



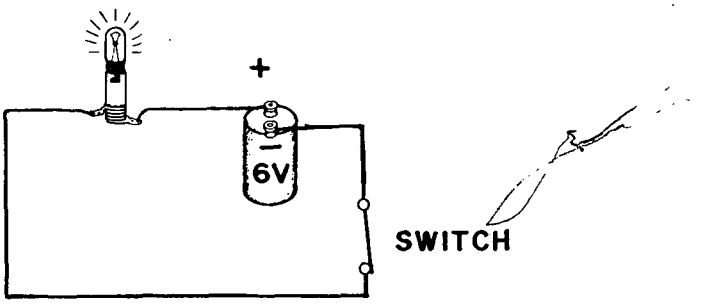
*29. B;

1 and 3;

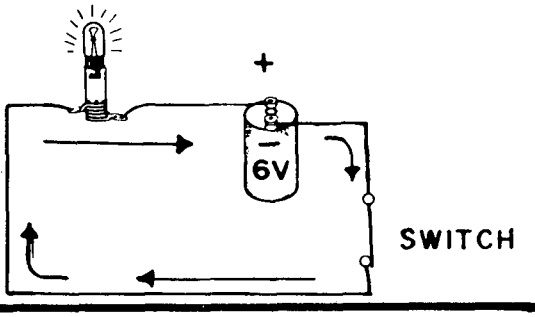
1 and 4

Figure 67—Continued.

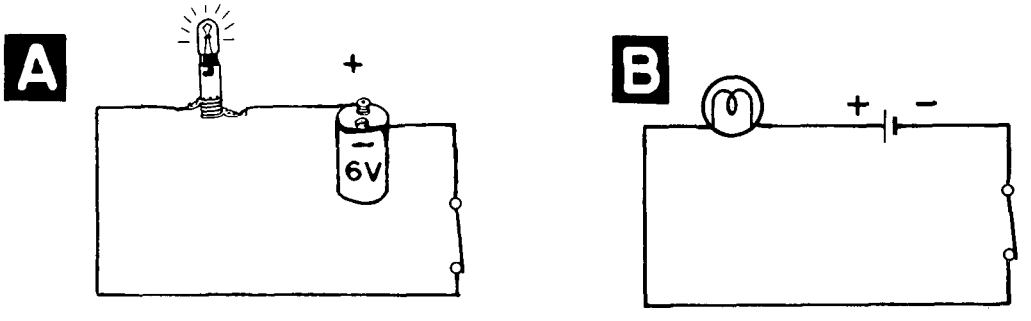
110. You know that this arrangement of battery, wires, switch, and lamp makes up a _____. Draw arrows to indicate direction of current flow.



110. circuit



111. Here's the same circuit again. In part A, we use pictures, but in part B we use symbols to represent (stand for) the actual parts of a _____.

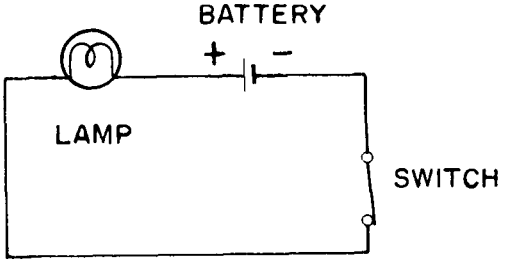


111. circuit

Figure 68. Sample of a linear program.

475-774 O - 72 - 6

112. The symbolic diagram of a circuit is called a SCHEMATIC. Symbols are used to represent the actual parts of the circuit below. Hence, this is called a _____ diagram.



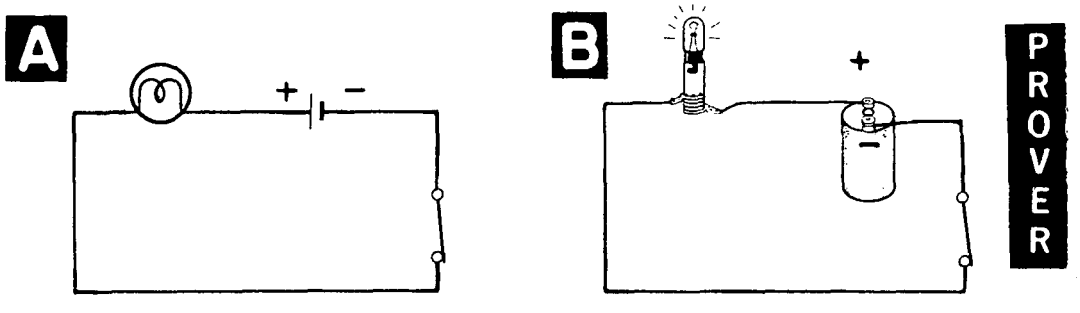
112. schematic

---

113. When symbols are used to represent actual parts of a circuit, the diagram is called a _____.

113. schematic

*114. Which diagram is a schematic? _____



114. A

Figure 68—Continued.

METHODS OF INSTRUCTION

1

INTRODUCTION

What is the BEST method of instruction? Asking this question is like asking a mother of ten children-- "Which one do you love the most?" She would find it impossible to select one from among the ten. Similarly, it would be impossible to say that one instructional method is better than all others. Each teaching situation must be carefully examined to select an instructional method which will best achieve the objectives of that lesson. If one method will do a better job than all others, then it is the best method to use for THAT particular lesson.

In this publication we will concern ourselves with the various methods of instruction. Specifically, you will learn the definition, advantages, and limitations of the lecture, conference, demonstration, practice, case, and incident process methods of instruction; and receive a general description of automated instruction, including use of teaching machines, programed texts, and Trainer-Tester.

Please turn to page 4.

Figure 69. Sample of a branching program.

You are NOT following instructions!

This publication is not put together like an ordinary book or pamphlet. Although the pages are numbered in sequence--that is: 1, 2, 3, etc. --the information will make sense only if you follow the instructions that are listed on each page.

Now, please turn to page 4.

Figure 69—Continued.

3
(Cont from page 4)

YOUR ANSWER: No. The lecture method would not be suitable for teaching a mechanical skill such as the disassembly of the M14 rifle.

You hit the nail right on the head! The lecture method is characterized by minimum student participation and strict control by the instructor of both the organization of material and the pace of the lesson. It would not be suitable for teaching mechanical skills, since the student must actively participate in a lesson in order to practice or learn the specific skill being taught.

However, despite the apparent disadvantages to the students, the lecture method does have several points in its favor. An instructor can present his material to a large audience, and can cover a large amount of material in a relatively short time by controlling the pace and organization of the lesson.

Based on this information, what type of lesson would be best suited to the lecture method?

	Page
Course orientation or introductory type	6
Detailed, factual, or discussion-type academic	5
Disassembly of an item of equipment	7

3

Figure 69—Continued.

(Cont from page 1)

THE LECTURE METHOD

The lecture method of instruction has been defined as "teaching by telling," wherein the instructor has strict control of both the lesson organization and its pace.

In other words, the student assumes a rather passive role in that he does not overtly participate in the lesson. His function is to listen to the instruction and to absorb the subject matter. In this method, the student has little opportunity to ask questions and receive further clarification of teaching points, or to physically participate in the lesson.

In light of the above, would the lecture method be suitable for teaching a mechanical skill such as the disassembly of the M14 rifle?

	Page
Yes	8
No	3

Figure 69—Continued.

5
(Cont from page 3)

YOUR ANSWER: Detailed, factual, or discussion type academic lessons are best suited to the lecture method.

Although there may be exceptions to the rule, we will have to disagree with you. With most academic lessons it is important for the student to participate in the lesson in order to better understand the material presented. In the lecture method, this participation is not required. The pace of the lesson may be too fast for the student to readily grasp each teaching point. Finally, there is no requirement for the instructor to question the students in order to determine if they are comprehending the material.

The lecture method can be used to good advantage for large groups, or where the instructor must cover a lot of material in a short period of time. This makes it particularly suited to the orientation and introductory type lessons. Another method should be used to present the more detailed academic type lessons.

Turn back to page 3 and reread the information there; then try again.

5

Figure 69—Continued.

6
(Cont from page 3)

YOUR ANSWER: Course orientations or introductory type lessons are best suited to the lecture method.

You're right! Orientations and introductory type lessons require little, if any, overt participation on the part of the students. In orientations, particularly, the students receive administrative instructions, information concerning scheduling, textbooks, etc. Introductory lessons usually prepare them for the more detailed academic lessons or practical work to follow.

With most academic lessons, it is important that the student be encouraged to participate in class discussions. It is also important that the size of the audience be limited, in order to permit the instructor to estimate student comprehension and observe student reaction to the instructional material. This is not possible, of course, with the lecture method. As you shall soon discover, there are other methods of instruction designed with these factors in mind.

So far, you have seen that the lecture method is primarily teaching by telling; that it is especially appropriate for lessons in which a lot of information has to be presented in a limited amount of time, and that little or no overt student participation is required when it is used.

Based on what you now know, which of the following would you consider to be a limitation of the lecture method?

	Page
The lecture method is suitable for use with large groups of students only	24
Students have no control over the pace and organization of a lecture	14
The instructor has few means of determining whether students are learning when he employs the lecture method	16

Figure 69—Continued.

7
(Cont from page 3)

YOUR ANSWER: Disassembly of an item of equipment lessons are best suited to the lecture method.

To disassemble an item of equipment requires mechanical skill, and we just stated on page 3 that the lecture method is not suited to teaching that type of skill.

Turn back to page 3 and reread the information there; then try again.

7

Figure 69—Continued.

8
(Cont from page 4)

YOUR ANSWER: Yes. The lecture method would be suitable for teaching a mechanical skill such as the disassembly of the M14 rifle.

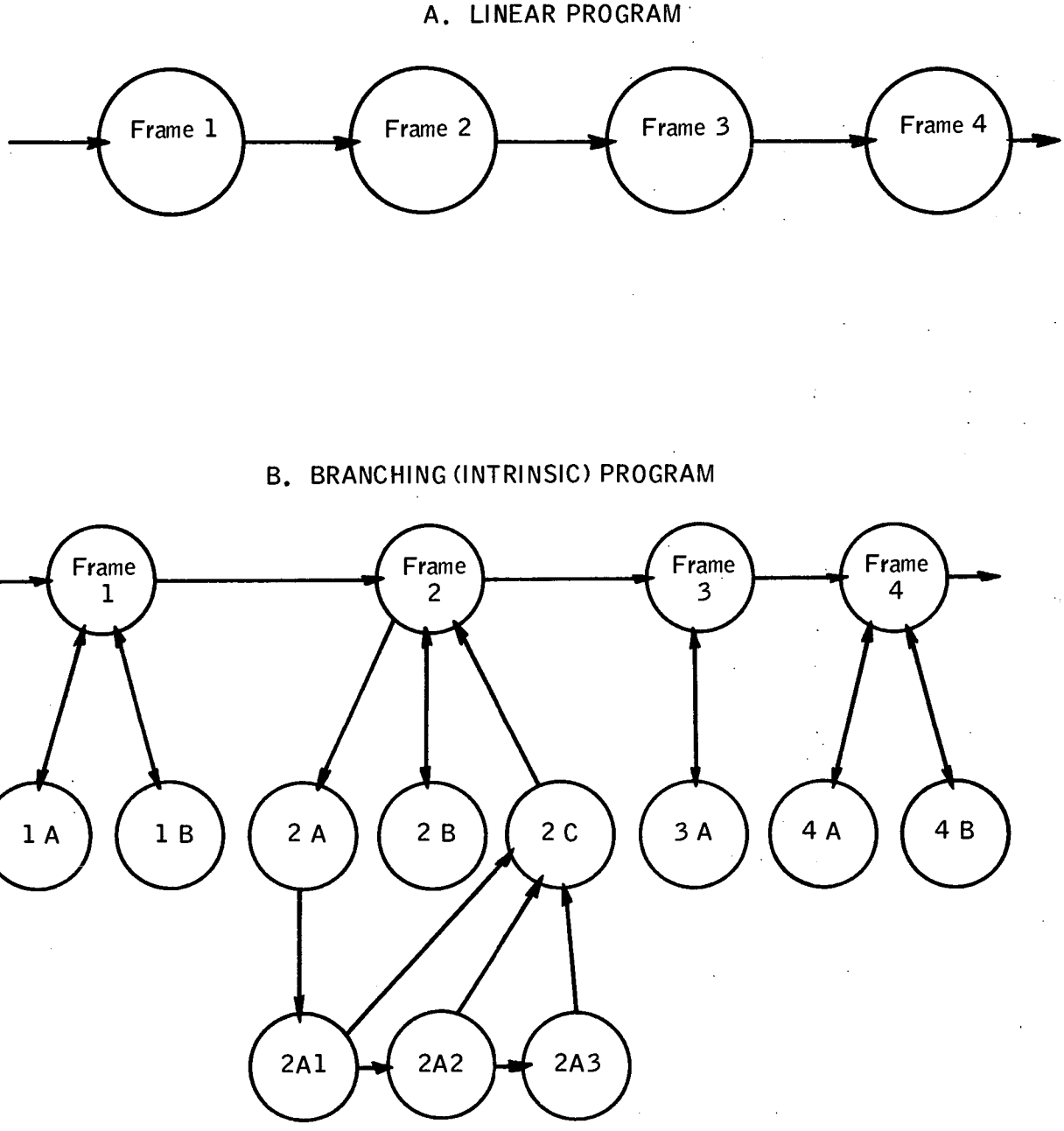
I'm afraid that you missed this one! In teaching mechanical skills it is necessary for the student to actively participate in the lesson, and actually do work in the desired mechanical skill. For example, a mechanic could not learn to disassemble a motor by listening to a lecture; he would have to physically participate in the motor disassembly in order to learn the proper procedures.

In the lecture method, remember, we said that the student assumes a passive role and that the instructor controls the organization and pace of the lesson. There is little opportunity for the student to actively participate in the lesson.

Now, please return to page 4 and select the other answer.

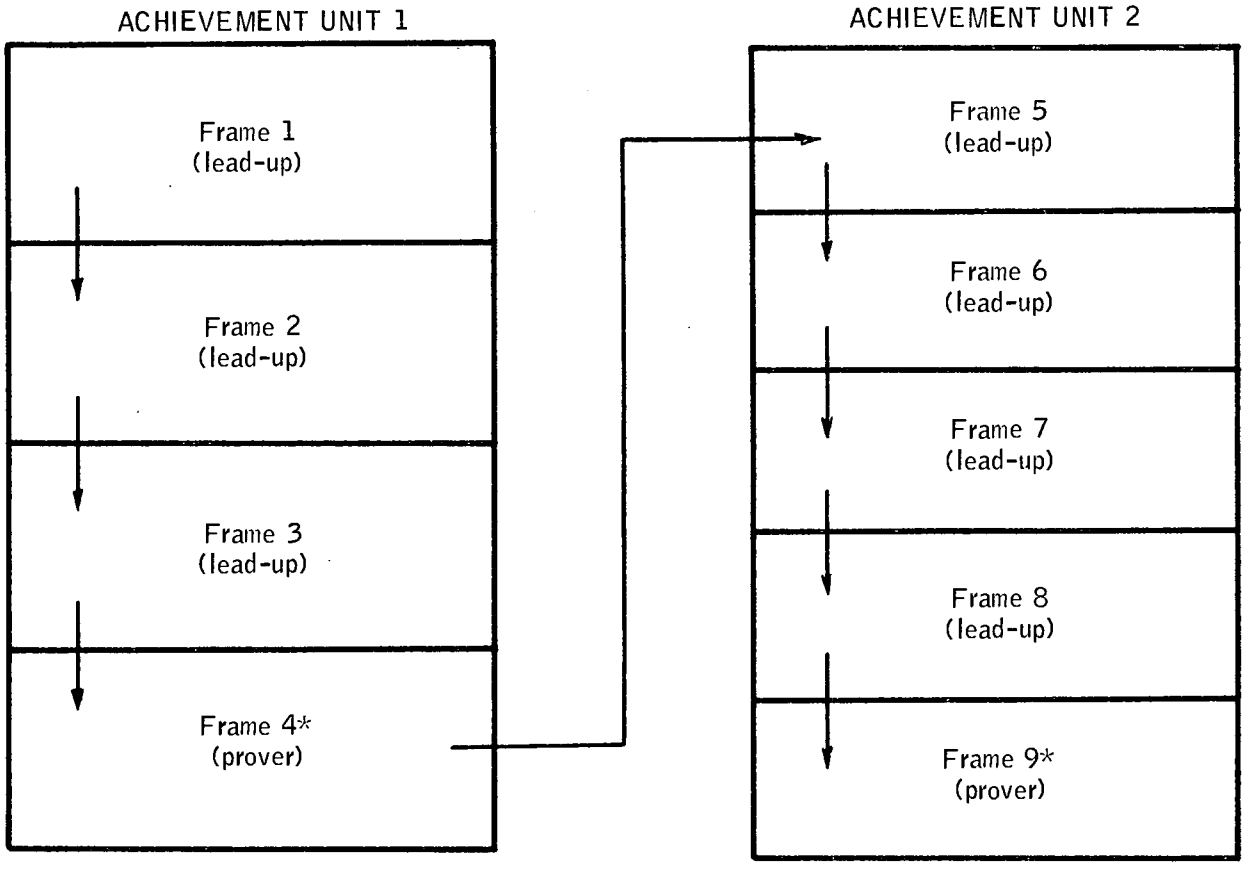
8

Figure 69—Continued.



SEQUENCE OF LINEAR AND BRANCHING PROGRAMS

Figure 70. Sequence of linear and branching programs.



STRUCTURE OF AN ACHIEVEMENT UNIT

Figure 71. Structure of an achievement unit.

CHAPTER 11

PREPARATION FOR INSTRUCTION

60. General

The instructor has a dual task of preparing himself to instruct and of preparing his students to receive his instruction. To accomplish this task the instructor should follow the logical approach outlined below.

61. Determining Lesson Objectives

First the instructor must determine what he has to teach. This should be based upon what he expects his students to be able to do as a result of his instruction. These student learning outcomes are called lesson objectives. Sometimes the lesson objectives, in broad terms, may be given to the instructor when he receives his instructional assignment. On other occasions the instructor may have to determine the lesson objectives. He may refer to appropriate Army training publications to ascertain the principles, procedures, and skills he has to teach. As an example, the instructor assigned to teach tank platoon battle drill would note that the ATP calls for him to teach combat formations, use of hand and arm signals, flag and other visual signals, and crosscountry movements. The instructor can get additional help on what must be taught by consulting the appropriate Army Subject Schedule and the MOS description as found in current directives. For example, the Army Subject Schedule indicates that teaching combat formations should include the purpose, advantages, and limitations of each formation and how each formation is executed. In determining what to teach, the instructor is guided by what the student should be able to do at the end of the instruction. These student behaviors should be so clearly perceived by the instructor that he will be able to express them clearly as lesson objectives. Clearly stated lesson objectives will help the instructor in guiding student learning so that the desired outcomes may be achieved. Criteria for good lesson objectives are that they:

a. Be Attainable. A lesson objective must be attainable within the period of instruction. The lesson objective, *"Be able to use demolitions,"* may be too broad to be realized within a short period of instruction; consequently, it is not attainable. On the other hand, the lesson objective, "Using the demolition card GTA 5–14, be able to determine the amount of charge needed to destroy a timber or steel obstacle," is more limited and can, therefore, be attained by the student within a short period of instruction.

b. Be Expressed in Terms of Specific Behavior that the Student Can Demonstrate and the Instructor Can Observe. A statement of an objective should designate what the student must be able to *do* or *perform* when he masters the objective. Because the instructor cannot look into the student's mind to determine what he knows, he can only determine the degree of the student's knowledge or skill by observing some phase of his action or performance. The student's action or performance may be varied. He may be asked to answer questions orally or in writing, or to perform a certain skill, or to solve certain kinds of problems. No matter what method is used, the instructor can only determine the state of the student's ability through observations of his performance. Thus, the most important criterion of a lesson objective is that it *identifies the kind of performance* acceptable as evidence that the student has attained the lesson objective. Contrast the following statements of objectives in terms of demonstratable learning outcomes: "To understand the operation of the AN/VRC–12 radio" and "To be able to identify by name each of the controls located on the front of the AN/VRC–12 radio." The first statement does not

tell the instructor what the student will be doing when he is showing that he has reached the objective. The second statement clearly indicates what the student will be doing when demonstrating his attainment of the objective —identify by name. It further tells the student the kind of response that will be expected of him when his mastery of the objective is tested. The way to write an objective that meets this criterion is to write a statement describing one of the instructor's training missions and then modify it until it answers the question, "What must the student do to demonstrate that he has reached the desired lesson objective?

c. State Conditions of Performance. For the student to know more precisely what he is expected to do, the instructor will sometimes have to further define the conditions of performance. For example, instead of simply stating "to be able to solve problems of range in tank gunnery" the instructor could improve his statement of lesson objective by wording it—"Given the width of the target and the mil angle, be able mentally to solve for range, using the mil relation." By answering the following questions about identifying important aspects of the learning outcomes he wishes to develop, the instructor can ensure that the conditions of performance are stated accurately:

(1) What will the student be given?
(2) What will the student be denied?
(3) What are the conditions under which the student is to demonstrate his attainment of the lesson objective?
(4) Are there any skills that the instructor is *not* trying to develop? Does the objective exclude such skills?

d. State Standards Acceptable. As a further means of specifying lesson objectives, the instructor can incorporate the standards or levels of performance considered acceptable. For example, the following statement of lesson objective guides the student in ascertaining the level of proficiency he must attain—"Given illustrations of 20 hand and arm signals, the student must be able to identify and write the meaning of at least 18 signals." In using the four criteria stated above to define the lesson objectives, the instructor should also consider such things as state of training, time available, equipment, facilities, training aids, and training conditions, in further limiting the lesson objectives.

62. Determining Subject Matter To Be Taught

a. Analysis of the Subject.

(1) After determining the lesson objectives, the instructor decides what skills or knowledge the student must learn for successful performance of the lesson objective. This breaking down of the lesson objective into major instructional steps is called analysis of the subject. For example, an analysis of the lesson objective, "Given the width of the target and the mil angle, be able mentally to solve for range, using the mil relation," results in a break down into the following instructional steps: explain and show what the mil relation is; explain and demonstrate how to divide the mil angle into the width of the target; explain and demonstrate how to convert the R factor into range; have the students solve problems for range first by paper and pencil and then by mental computation.

(2) After breaking down the lesson objectives into instructional steps, the instructor should support each instructional step with the necessary subpoints in the form of facts, principles, and procedures for the student to be able *to accomplish each step.* The instructor gets these facts, principles, and procedures from studying the recognized reference material on the subject. He must have well-referenced, up-to-date information. The importance of the instructor's study of his subject as an important phase of his preparatory efforts cannot be over-emphasized. He should not depend solely on field experience to carry him through.

(3) In addition to supporting each main point or instructional step with the necessary subject matter, the instructor should plan to use other means of

TYPE	CHARACTERISTICS	USE
1. EXAMPLES		
a. Specific instance (short example).	a. Since each specific instance must be brief, several instances, clear, accurate, and to the point should be used in support of each idea developed.	a. Excellent for proof. Adds weight to argument. Adds strength to ideas.
b. Illustration (long example).		b. Stimulates interest and holds attention.
(1) Factual.	(1) Must be something that has already happened, described in detail. Must be clearly related to the point at hand.	(1) Gives clarity to ideas. Can be used for proof. Described in detail, it carries conviction.
(2) Imaginary or hypothetical.	(2) Must be realistic, vivid, and consistent with known facts. Should be something that could happen and most probably will unless certain steps are taken.	(2) Value is doubtful when used for proof. Should be used for making abstract ideas more concrete, and for explaining complicated tasks.

Figure 72. Ways of supporting points.

support, such as short examples, illustrations, and comparisons, to add interest to the subject.

b. Specific Ways of Supporting Points. The usual ways of supporting main points by factual information, principles, and procedures are well known to the instructor and need not be dwelled on further. However, the use of examples, testimony, comparisons, statistics, and restatement gives the instructor an opportunity

TYPE	CHARACTERISTICS	USE
2. TESTIMONY	2. Select an authority in the particular field. Establish the individual as an authority if he is not well-known by stating his qualifications. Make sure that his statement is first-hand knowledge, that he is not prejudiced, and that the audience respects his opinion.	2. Helps to convince. Adds interest. May be used in cumulative form to good advantage.
3. COMPARISONS		
a. Literal or precise.	a. Items being compared must be alike in characteristics important to the comparison.	a. Relating known to unknown. Pointing out similarities.
b. Figurative (analogies, similes, metaphors, fables).	b. Avoid triteness. Comparison must be clearly related to the ideas. Analogies should have more than one point of comparison and should be easily grasped.	b. Adds richness and color, thereby holding attention. Clarifies ideas. Does not constitute proof. Beware of carrying beyond reason.

Figure 72—Continued.

TYPE	CHARACTERISTICS	USE
4. STATISTICS	4. Use round numbers (about 4,000 instead of 4,129). If a number must be remembered, write it on the chalkboard. Figures should be compared one to another and related to previous experiences.	4. Used to show the proportion of instances of a certain kind. Used judiciously, they are impressive and convincing. Use with other types for added emphasis. Beware of using too many figures; by themselves they are unimpressive, especially large ones such as "4 billion."
5. RESTATEMENT	5. Consists of saying the same thing, but saying it in a different way.	5. Restating ideas in more familiar and realistic terms increases the impression the student will retain. Use for clarification of facts and ideas presented.

Figure 72—Continued.

to make his instruction more interesting, meaningful, and realistic. To derive full benefit from the use of these vitalizing ways of supporting points, the instructor should be aware of their characteristics and uses as outlined in figure 72.

63. Determining How the Lesson Will Be Taught

a. Organization. So far in his preparatory efforts the instructor has concerned himself

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largely with subject development—what to teach. Now he has to consider two other important factors—how to organize the subject matter (the sequence of main points and subpoints) and what methods and techniques to use to best enable the student to attain the lesson objectives. Some common sequences are—

(1) *Chronological.* With learning that involves procedures or steps, the instructor should arrange them in the time order in which they will logically occur. For example, if he were teaching "March Orders," he would present his instruction in the sequence in which a movement takes place, i.e.,

0800—Cross starting point
0820—Arrive check point Alfa
0845—Arrive check point Bravo
0900—Arrive release point.

(2) *Procedural.* Often, the reference material that an instructor studies will already be written in a sequence suitable for teaching. For example, "The four life saving steps," "The five-paragraph field order," etc.

(3) *Whole-part-whole.* This is the developmental order that psychologists claim is best to learn new material. Give the big picture, then details, then restate or summarize with the overview or big picture. For example, in presenting instruction on "The Mission of a Rifle Company" the instructor could state the rifle company's mission (the whole) then the responsibilities or mission of the platoons, squads, fire teams, etc. (the parts), then his summary would lead back up to the rifle company's mission (the whole).

(4) *Simple to complex.* Start with the most basic points and build slowly step by step into the most difficult requirements. For example, in teaching "Grid Coordinates" to new soldiers, the instructor could start by showing an enlargement of one grid square (simple) then show how that one grid square is divided into tenths (more complex) and finally, a map containing many grid squares (most complex).

(5) *Orderly in space.* When explaining the nomenclature and composition of equipment or complex aids, proceed from left to right or vice-versa, top to bottom or vice-versa, outside to inside, etc., whichever appears to be the most logical.

b. Methods and Techniques. The instructor should plan to use methods and techniques that are best designed to help the student attain the lesson objectives. For example, to help the student attain the lesson objective of being able to adjust the head space on the machinegun, caliber .50, the instructor should plan for ample practical work—controlled practice and independent practice (see para 47). In addition to insuring that his methods are in consonance with the learning outcomes, the instructor should apply the following guiding principles in devising his instructional plan:

(1) *Present material in small, cohesive segments.* To facilitate learning, the instructor should break down the instruction into learnable steps. Too often the instructor who fails to make this breakdown creates confusion in his students' minds because they cannot readily absorb the mass of material he presents.

(2) *Require maximum student participation in each segment.* To insure full student learning of each segment, the instructor should plan to ask questions, have students solve problems, or do practical work after having learned a segment or closely related segments.

(3) *Present material in logical sequence.* Students will learn better if each segment is presented so that the entire instruction makes sense to them. The instructor should make the student aware of the relationship between the segments of the instruction by use of well planned transitions (see para 15*b*).

(4) *Design work to insure successful response.* A student's successful response to a question or successful completion of a step in the perform-

ance of a skill motivates him to continue learning. Furthermore, successful response, particularly in skill learning, helps eliminate wasteful trial-and-error learning.

(5) *Correct errors on the spot.* The instructor should plan to supervise practical work carefully. Long periods of practical work in which evaluation of student performance is scheduled as a formal critique at the end are generally ineffective.

(6) *Select methods that give the instructor maximum control of student learning.* During a long, uninterrupted lecture, demonstration, or training film, the instructor does not know how the student is responding to his instruction. He does not know whether the student is learning or paying attention. Such methods generally are less effective than those that require the student to participate in the instruction. Good instruction generally requires a combination of methods applied repeatedly throughout a period of instruction.

64. Preparing A Lesson Plan

a. Content. The lesson plan is the blueprint of the instructor's planned activities. It includes a checklist of administrative matters, in the form of a heading; an indication of instructor and student activities, and an outline of the the main points of subject matter, properly supported by subpoints and illustrative material (see fig. 73).

b. Purpose. An instructor makes a lesson plan to serve as a check of his preparatory efforts to insure that the lesson is complete. By reviewing the lesson plan, the instructor fixes in his mind the sequence of the main points and subpoints, the time he will devote to each point, the methods he will use, the questions he will ask, and the places where he will use training aids. Because the instructors may use the lesson plan, it must be sufficiently detailed, clear, and complete.

c. Use.

(1) *As a basis for making notes.* The instructor does not read the lesson plan to the class. Instead, he uses the plan to make a few brief notes that he can readily consult during the presentation of his unit of instruction. He should keep the lesson plan handy during class in the event he has to consult it for some detail.

(2) *As a guide.* Except for the instructor's manuscript, the typical lesson plan merely outlines subject and techniques; it does not include everything that the instructor says and does during class. To make the instruction meaningful, the instructor must include in the lesson plan examples, illustrations, and practical applications.

d. Types. Lesson plans are written in outline form; outlines may be topical, sentence, or paragraph. The instructor's manuscript, which contains everything that is to be said and done during a period of instruction, is a variation of the lesson plan.

(1) *Topical plan.* In the topical plan, a common type, the main points and subpoints are indicated by brief phrases or single words.

Example:

(1) Characteristics of a good message.
  (a) Accuracy.
  (b) Brevity.
  (c) Clarity.
(2) Text of the message.

(2) *Sentence plan.* In the sentence plan either the main points or subpoints or both are indicated by complete sentences.

Example:

(1) Characteristics of a good message.
  (a) Information contained in a message should be factual, not hearsay.
  (b) Messages should be written as briefly as possible, consistent with clarity.
  (c) Messages should be so written as to be clearly understandable to the addressee.
(2) The text of the message.

(3) *Paragraph plan.* In the paragraph plan the main points are indicated by topics or sentences and the subpoints by paragraphs.

The type of lesson plan the instructor should make depends on his desires and those of his organization. No matter what type plan is made, it should be clear, sufficiently detailed, and usable.

e. Format.

(1) The organization of a lesson is reflected in the major divisions of the lesson plan. The major divisions are the major instructional activities through which the lesson objectives are to be attained. The major divisions should be in the exact sequence in which the lesson is to be taught. For example, if the instructor plans first to introduce the lesson, then to explain the main ideas, and last to summarize these ideas, he should outline his lesson plan as follows: (See fig. 74.)

1. INTRODUCTION
2. EXPLANATION
3. REVIEW

When the instructor desires to follow his explanation with a practical exercise that he will critique as the exercise progresses, and then give a test he should outline the major instructional activities (major divisions of the lesson plan) as follows: (See fig. 73).

1. INTRODUCTION
2. EXPLANATION AND/OR DEMONSTRATION
3. APPLICATION
4. EXAMINATION
5. REVIEW

When major instructional activities are so closely interwoven that it would accomplish no purpose to separate them into distinct major divisions. For example, in initially teaching the disassembly and assembly of a weapon, the instructor plans to (1) introduce the subject, then to (2) explain and demonstrate the disassembly of a part and immediately have the students disassemble the part, then (3) to allow the students to disassemble the entire weapon at their own speed under close supervision of the instructor and his assistants, and (4) finally to summarize the lesson. He would outline the lesson as follows:

1. INTRODUCTION
2. EXPLANATION, DEMONSTRATION, AND PRACTICAL WORK
3. APPLICATION
4. REVIEW

(2) The determination of the major divisions of a lesson plan is flexible. Because instructors have to teach many different lessons, using various instructional activities, it is difficult to try to cast all lesson plans into a predetermined format. Instead, the instructor should plan how he is going to teach each lesson and then make the major divisions of his lesson plan reflect that sequence.

(3) After the determination of the major divisions of a lesson, he should develop each major division to reflect in detail:

(*a*) *Outline of subject matter.* Indicate the main subject points and subpoints.

(*b*) *Methods of instruction and time.*

1. INTRODUCTION (Conference—3 minutes)
2. EXPLANATION, DEMONSTRATION, AND PRACTICAL WORK (Controlled Practice—47 minutes)
3. APPLICATION (Independent Practice—45 minutes)
4. REVIEW (Conference—5 minutes)

(*c*) *Instructional procedures.* The instructor should indicate where he intends to use instructional procedures by the use of such terms as NOTE, EXAMPLE, SUMMARIZE, CAUTION, TRANSITION. (See fig. 73.)

(*d*) *Oral questions and answers.* The instructor should insert the ques-

LESSON PLAN

(HEADING)

INSTRUCTIONAL UNIT: (What is the subject to be presented?)

TYPE: (Which methods will be used? Lecture, conference, demonstration, evaluation, practical exercise.)

TIME ALLOTTED: (How much time?)

CLASSES PRESENTED TO: (Who will receive the instruction?)

TOOLS, EQUIPMENT, AND MATERIALS: (What items will the instructor need to supply to the students?)

PERSONNEL: (What instructors are needed?)

TRAINING AIDS: (What training aids will be required? Detailed description of aids may be put into an annex to the lesson plan.)

REFERENCES: (Where is the subject matter found?)

STUDY ASSIGNMENTS: (What should the student study before the class?)

STUDENT UNIFORM AND EQUIPMENT: (How should the student dress, and what should he bring?)

TROOP REQUIREMENTS: (What demonstration troops, if any, will be needed?)

TRANSPORTATION REQUIREMENTS: (What form of transportation, if any, will be needed to take students to training site?)

Note. Place all information regarding preparation necessary for the conduct of the lesson in the heading of the lesson plan. Do not omit elements of the heading; if they do not apply, write None. The heading serves as a checklist for the preparation stage.

Figure 73. Sample lesson plan format.

tions and, when appropriate, answers at the places in the plan where he expects to ask the questions. (See fig. 73.)

f. Outlining.

(1) *What to designate.* Designate the following: major divisions or major instructional activities, main points of subject matter and supporting points of subject matter.

(2) *How to designate.*

(*a*) For the sake of uniformity use only Arabic numerals and lower case letters. See figures 73 and 74 for sample outline forms showing designation of topics.

(*b*) Do not use any number or letter designation preceding instructional procedures. (See fig. 73.)

Examples:

WRONG

(1) Fundamental logistical considerations.

(a) Supply is a function of command.

(BODY)

1. INTRODUCTION (Indicate method and time required.)

Note. If some special technique is used to gain the attention of the class, such as a demonstration or skit, put it into the lesson plan as a NOTE.

a. Objective. List the specific things the students are to learn.

b. Reasons. Tell why the students are to learn the subject. Stress its importance.

c. Review. Indicate the tie-in with previous instruction.

d. Procedure. Indicate the instructional activities that will occur during the lesson.

Note. The objective and reasons should be included in all lessons. The review and procedure may be used when appropriate. These elements of the introduction may be outlined in any order that seems best for the presentation.

2. EXPLANATION AND/OR DEMONSTRATION (Indicate method and time required.)

a. All main subject matter points of the explanation and/or demonstration should be designated a, b, c, etc.

b. Supporting points for the main subject matter points in subparagraph 2a above are indicated by (1), (2), (3), etc. If these supporting points need further support the instructor should indicate such support by (a), (b), (c), etc.

c. When notes, training aids, questions, and other instructional procedures supplementary to the lesson are used, they are put into the plan as follows:

Note. Show slide 7.

Figure 73—Continued.

(b) Impetus of supply from rear to front.
(c) Need for advanced flexible planning.
(d) Adequate reserves in all echelons.
(e) Summarize considerations.

RIGHT

(1) Fundamental logistical considerations.

(a) Supply is a function of command.
(b) Impetus of supply from rear to front.
(c) Need for advanced flexible planning.
(d) Adequate reserves in all echelons.

Summarize: Fundamental considerations.

QUESTION: What are the advantages of the platoon line combat formation?

ILLUSTRATION: Draw circuit diagram on chalkboard.

CAUTION: Do not give the injured man alcohol.

EXAMPLE: Combat story of a poorly planned patrol action.

SUMMARIZE: First three points covered.

d. When a demonstration is used, outline the steps of the procedure in proper order. Include questions to check understanding, notes on use of equipment, and safety precautions.

3. APPLICATION (Indicate method and time required.)

a. Directions to Students.

(1) Purpose.

(2) Tools and equipment to be used.

(3) Procedure for the conduct of the practical work.

(4) Safety precautions to be observed.

b. Directions to Instructors.

(1) How to introduce the practical work.

(2) How to conduct the practical work.

(3) Checks to be made on the presence and working conditions of tools and equipment.

(4) Supervision of students and assistant instructors.

(5) Duties of the assistant instructors.

(6) How to summarize the practical work.

c. Practical Work.

(1) Description of the practical work.

(2) List of problems and answers.

Figure 73—Continued.

(*c*) Since a topic is not divided unless there are at least 2 parts, an outline should have at least 2 headings in each order. If there is a (1), there must be a (2); if there is an (a), there must be a (b).

65. Rehearsing the Lesson

A rehearsal of each new lesson provides the final check on the instructor's plan (fig. 75).

a. Rehearsals should be complete in every regard and follow the order of presentation. Instructors should use the indicated training aids, ask questions where called for in the lesson plan, conduct the scheduled demonstrations, and if practical work or examination is used, check it during the rehearsal. The physical setup should as closely duplicate the actual situation as possible.

b. Assistant instructors must be present and rehearse their duties as they would perform them during the actual lesson.

(3) Practical exercise situations and requirements are normally included as an annex to the lesson plan.

4. EXAMINATION (Indicate method and time required.)

a. Written Tests. Include complete test with directions in an annex to the lesson plan.

b. Oral Tests. Include questions to be asked.

c. Observation of Student Work.

(1) List specific points to check.

(2) Indicate how to rate or score the students.

5. REVIEW (Indicate method and time required.)

a. Clarification of Points of Difficulty. Ask students if they have any questions.

b. Summary of the Lesson.

(1) List the main points.

(2) List the key ideas of the main points.

c. Closing Statement. Outline in detail or write out.

ANNEXES: (If annexes are used to supplement the lesson plan list them on the last page of the lesson plan, following the closing statement.)

Figure 73—Continued.

c. An audience consisting of one or more persons, who can give the instructor valuable constructive criticism, should be present. Points of criticism include clarity and organization of the material; effectiveness in use of training aids; proper delivery and manner; effectiveness of questions, demonstrations, and practical work; and overall timing of the lesson.

d. If time does not permit a complete rehearsal, the instructor must at least talk through the mainpoints of the lesson and fix in mind his approach to the instruction.

66. Making A Final Check

Prior to the class, the instructor and his assistants must insure that everything is ready (fig. 76). The instructor should check to see that—

a. The necessary equipment is on hand.

Note. A lesson that does not use all of the instructional activities indicated in figure 73 will number only those instructional activities used and omit the others. A lesson requiring the use of only oral instructional activities is outlined in the following sample:

1. INTRODUCTION (Lecture--3 minutes.)
   a. Objectives.
      (1)
      (2)
      (3)
   b. Reasons.
      (1)
      (2)
2. EXPLANATION (Conference--25 minutes.)
   a. First Main Subject Matter Point.
      Note. Use slide 1.
      (1)
      (2) Supporting points for a above.
      (3)
      (4)
   b. Second Main Subject Matter Point.
      (1) Supporting point for b above.
      (2) Another supporting point for b above.

   QUESTION: Write out question.

      (3) Another supporting point for b above.
      Note. Use slide 2.

Figure 74. Sample lesson plan format.

b. The seating, heating, ventilation, and lighting are properly arranged or adjusted.

c. All instructional materials for students' use are on hand and ready for distribution.

d. All assistants are present and understand their duties.

e. All training aids are on hand and are properly arranged for use.

f. Lesson plan and notes for use during the lesson are on hand.

g. He is properly dressed and groomed.

c. Third Main Subject Matter Point.

(1) Supporting point for c above.

Note. Use chalkboard.

(2) Another supporting point for c above.

(a) Subordinate point for (2) above.

(b) Another subordinate point for (2) above.

1. Item to support (b) above.

2. Another item to support (b) above.

Note. Use slide 3.

3. REVIEW (Conference--2 minutes.)

a. Student Questions.

b. Recap of Main points.

(1) First main subject matter point.

(2) Second main subject matter point.

(3) Third main subject matter point.

c. Closing Statement. Outline in detail or write out.

Figure 74—Continued.

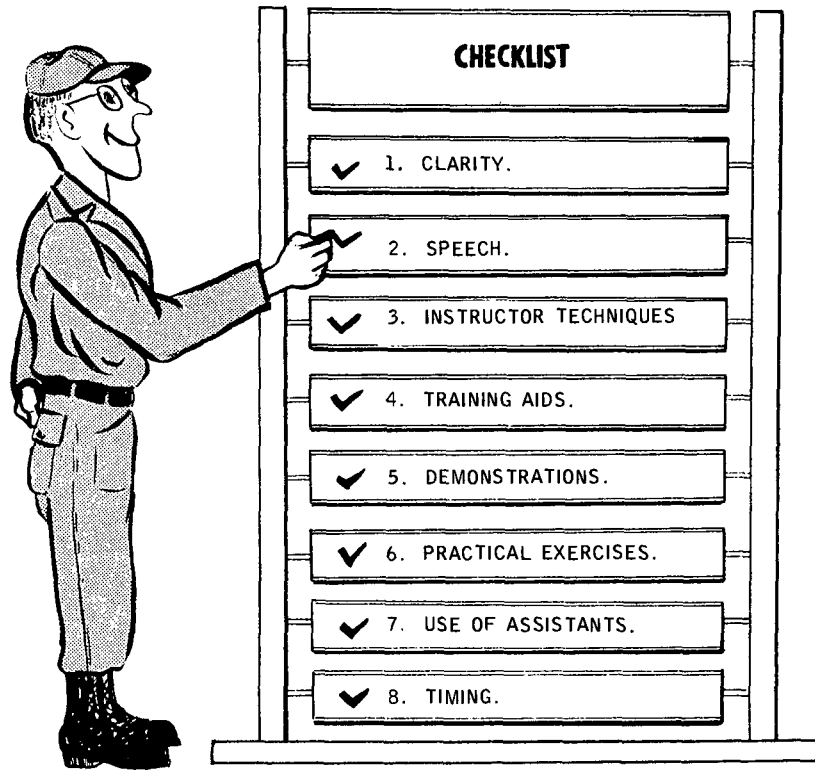

Figure 75. Rehearsal checklist.

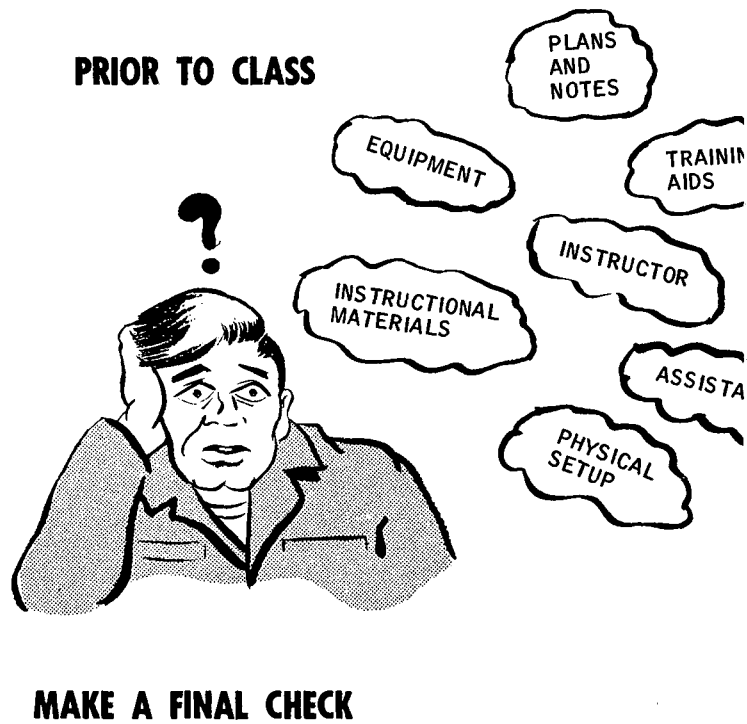

Figure 76. Making a final check.

CHAPTER 12

EVALUATION

67. General

"How am I doing?" The instructor as well as the student needs an answer to this question. And the question needs to be asked and answered repeatedly. Evaluation is an essential phase of the instructional process and includes a variety of devices and methods that the instructor uses to keep himself and his students informed of their progress. Some of these devices and methods of evaluation were described in earlier chapters of this manual, such as oral questions — to check student understanding during the presentation phases of instruction, and on-the-spot correction of errors during the application phase. This form of evaluation, informal and immediate, is an integral part of the teaching process; for maximum learning, it must not be separated from ongoing instruction. This chapter deals with another form of evaluation—achievement testing. The primary purpose of this form of evaluation is to measure student retention of the knowledge, skills, abilities, and attitudes required for job proficiency.

68. Purpose of Tests

The use of tests in Army training accomplishes four major purposes (fig. 77):

a. Tests Aid in Improving Instruction by—

(1) *Discovering gaps in learning.* Properly constructed tests reveal gaps and misunderstandings in student learning. If frequent tests are given, such weaknesses can be discovered and instructors can correct them by reteaching their material.

(2) *Emphasizing main points.* A test is actually a valuable teaching device in that students tend to remember longer and more vividly those points that are covered in an examination. Tests encourage students, as well as instructors, to review the materials that have been presented and to organize various phases of instruction into a meaningful set of skills, techniques, and knowledge.

(3) *Evaluating instructional methods.* Tests measure not only student performance but also instructor performance. By studying the results of tests, instructors can determine the relative effectiveness of their various methods and techniques.

b. Tests Provide an Incentive for Learning. Students learn better when made to feel responsible for learning. For example, they are more likely to pay close attention to a training film if they know that a test will be given when the picture is over. Generally, instructors who give frequent tests will find that their students will be more alert and learn more. There is a danger, however, in overemphasizing tests and test results as the basic motivation for learning. Student interest in test scores is a superficial one that can easily lead to efforts to study for the test rather than learn the subject matter for its value in the future. The instructor should give rigid tests and give them frequently, designed to require the student to apply what he has been taught.

c. Tests Provide a Basis for Assigning Grades. Another purpose of testing is to determine which students have attained the minimum standard of performance and which have not. In many cases it is desirable to indicate the extent to which students exceed or fall below the standards required. Students learn different amounts; the grade recorded for each student should be an accurate index of what

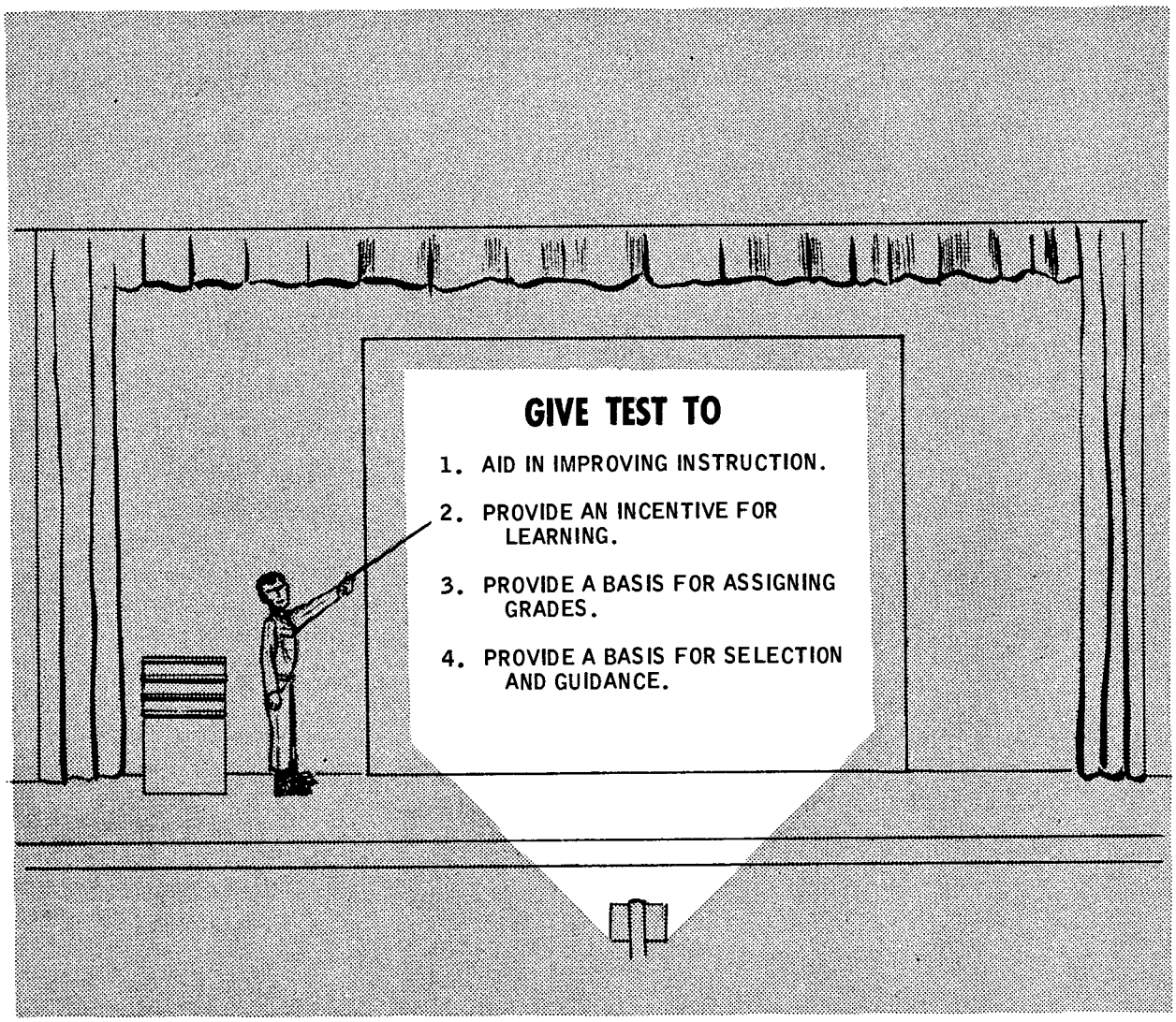

Figure 77. Reasons for tests.

he has learned. Unless a sound testing program is employed, it is impossible to determine the relative achievement of students.

d. Tests Furnish a Basis for Selection and Guidance. Instructors should be familiar with those Army tests that are especially designed to help in the classification of men and their subsequent selection for various Army assignments. These include area aptitude batteries and MOS evaluation tests. In addition, the results of training achievement tests furnish valuable supplementary information for selection and guidance of personnel. If tests are well-constructed and actually measure student performance, the test results become a valuable basis for determining whether a student should be placed in a new job, whether he should receive advanced training, or whether he should be recommended for promotion to a job requiring greater ability.

69. Forms of Evaluation

Formal evaluation can be classified into three major categories—written tests, performance tests, and observation ratings. Each form has its specific uses, advantages, and limitations. For a well-rounded test program, all techniques should be used.

a. Written Tests. Written tests can measure knowledge, mental skills, and abilities. Short-answer type written tests have the added value of affording a rapid measure of student knowledge over a large area of subject matter. Because written tests can only indirectly measure manipulative skills, in most Army training programs, performance tests should be used. The various types of written tests and their construction are discussed in paragraph 72.

b. Performance Tests. A performance test measures how well students can do or perform a manual task. Students are required to make, service, repair, operate, shape, assemble, or disassemble something, and are checked on their speed, quality of work, and procedures. Performance tests measure manual skills, and ability to apply knowledge in manipulative tasks (see para 73). The advantages of performance tests are—

(1) Provide the most direct means of determining whether men can actually do a physical task and do it well. A student may pass a written test on how to reline brakes, but commit several errors while actually carrying out the task.

(2) Reveal better than any other type of test specific difficulties that students encounter when doing a job.

(3) Provide the only effective way of revealing whether students—

(*a*) Handle tools effectively.

(*b*) Observe all necessary safety precautions.

(*c*) Carry out the operations in the correct order or sequence.

(*d*) Can operate under pressure.

(*e*) Care for tools properly.

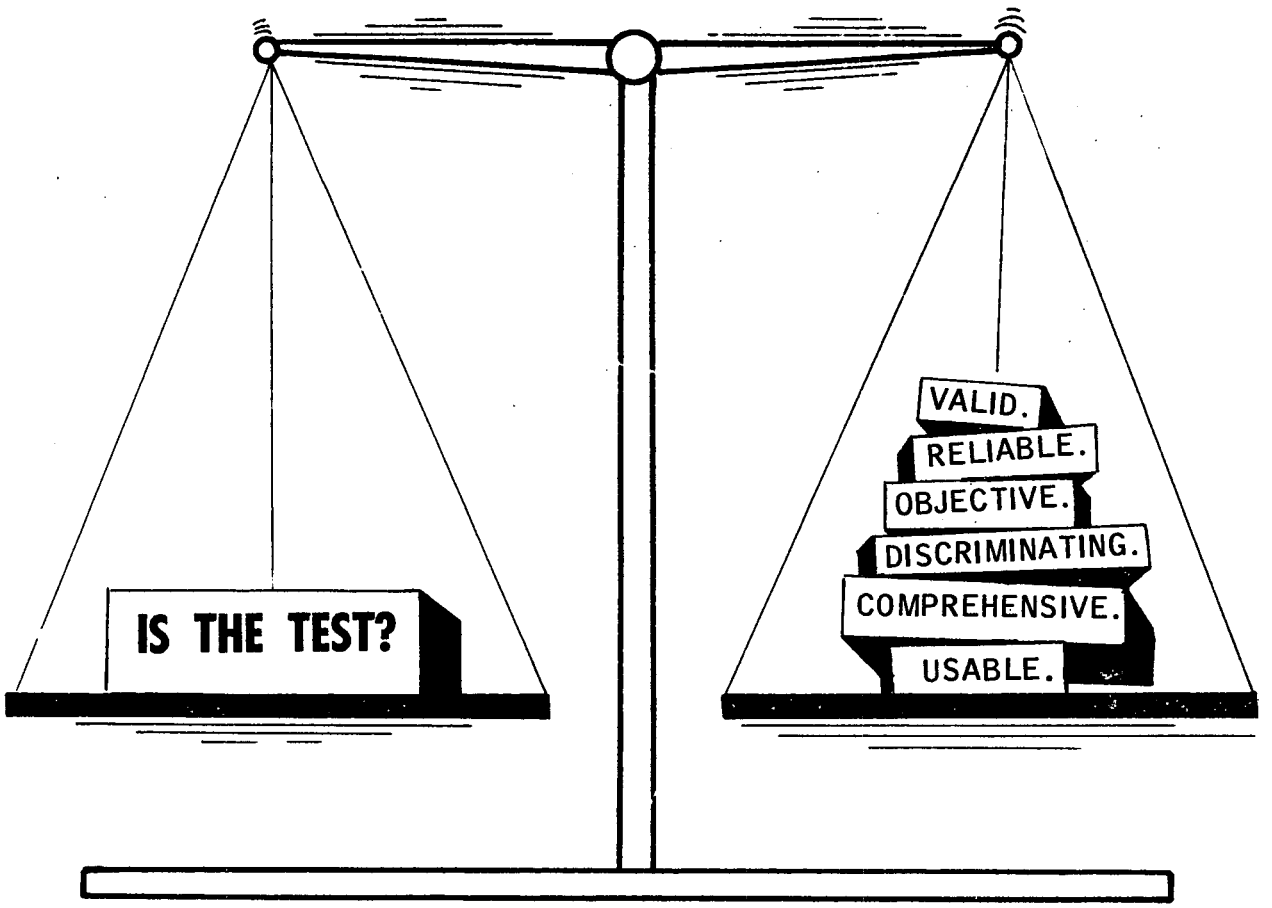

Figure 78. Characteristics of a good test.

c. Observation. If the problem is to evaluate students on leadership, observers must see the students in situations that permit them to demonstrate their leadership ability, such as giving commands, directing activities of a small unit, making and executing decisions. Similarly, to judge a student's ability as an instructor, he must be observed as he handles classes under varying conditions. Observation and observation techniques (see para 74) are of great importance in Army training because many phases of student achievement and behavior cannot be measured by the more formal kinds of tests.

70. Characteristics of A Good Test

There are six important factors that affect the quality of an examination (fig. 78). These factors, while not considered to be separate and distinct, are defined and discussed separately, in order to develop a clear understanding of the characteristics of all forms of evaluation.

a. Validity. The most important characteristic of a good examination is validity; that is, the extent to which a test measures what it is intended to measure. The instructor insures that his test items are valid by following accepted test construction procedures that include—

(1) Use of the lesson objectives as a basis for the test requirements. An examination so constructed will tend to measure what has been taught.

(2) Review of the test items and the complete examination by other instructors.

(3) Selection of the most appropriate form of test and type of test item. Thus, if the instructor desires to measure "ability to do," he must select that form of test that will require the student to demonstrate his "ability to do." If another less desirable form is used, it must be recognized that the validity of the measurement has been reduced.

(4) Presentation of test requirements in a clear and unambiguous manner. If the test material cannot be interpreted accurately by the student, he will not realize what is being covered; hence, he will be unable to respond as anticipated. Such a test cannot be valid.

(5) Elimination, so far as is possible, of those factors that are not directly related to the measurement of the teaching points. A test that requires a very high proficiency of reading ability to measure proficiency in preventive maintenance, for example, may lack validity for the average reader. A test that is not within the capabilities of the students as to time or educational level may fail to measure their actual learning in the course.

b. Reliability. An examination is reliable if the results obtained are consistent; that is, if the test tends to measure student achievement so as to yield comparable results each time it is administered. In order for the test results of one class to be compared with those of other classes, a high degree of reliability must be inherent in the testing procedures. The following factors will influence the reliability of a test:

(1) *Administration.* It is essential that each student have the same time, equipment, instructions, assistance, and examination environment. Test directions should be strictly enforced.

(2) *Scoring.* Objectivity in scoring contributes to reliability. Every effort should be made to obtain uniformity of scoring standards and practices.

(3) *Standards.* The standards of performance that are established for one class should be consistent with those used in other classes. A change in grading policies not based upon facts, uniform standards, and experience factors gained from other classes will affect the reliability of test results.

(4) *Instruction.* The reliability of test results will be affected if the instruction presented to a class tends to overemphasize the teaching points included in the examination. This is often known as "teaching the test" and is undesirable. The instructor should stress the teaching points in

each unit of instruction because of their contribution to the military training requirement; when he does this in a conscientious manner he will be giving sufficient stress to the subject matter that will be included in the test. When the instructor gives students obvious clues as to the test requirements, he not only affects the reliability of the test, but he insults the intelligence of his class.

(5) *Length.* The more responses required of students, the more reliable will be the test or measuring device.

c. Objectivity. A test is objective when instructor opinion, bias, or individual judgment is not a major factor in scoring. Objectivity is a relative term. Some tests, such as written examinations that are machine graded, are highly objective; others, such as essay examinations, written exercises, and observation techniques, are less objective. Sometimes observation is the only effective way of determining proficiency; this is true, for example, in some phases of instructor training. In such cases, the instructor must strive to make his observations as objective as possible.

d. Discrimination. The test should be constructed in such a manner that it will detect or measure small differences in achievement or attainment. This is essential if the test is to be used for ranking students on the basis of individual achievement or for assigning grades. It is not an important consideration if the test is used to measure the level of the entire class or as an instructional quiz where the primary purpose is instruction rather than measurement. As is true with validity, reliability, and objectivity, the discriminating power of a test is increased by concentrating on and improveing each individual test item. After the test has been administered, an item analysis (see para 77) can be made that will show the relative difficulty of each item and the extent to which each discriminates between good and poor students. Often, as in obtaining reliability, it is necessary to increase the length of the test to get clear-cut discrimination. A discriminating test—

(1) Produces a wide range of scores when administered to the students who have significantly different achievements.

(2) Will include items at all levels of difficulty. Some items will be relatively difficult and will be answered correctly only by the best students; others will be relatively easy and will be answered correctly by most students. If all students answer an item correctly, it lacks discrimination.

e. Comprehensiveness. For a test to be comprehensive, it should sample major lesson objectives. It is neither necessary nor practical to test every objective that is taught in a course, but a sufficient number of objectives should be included to provide a valid measure of student achievement in the complete course.

f. Usability. A test should be relatively easy to administer, to score, and to interpret; in other words, it can be produced, administered, and scored at a reasonable cost of time and personnel. Individual test requirements should also be evaluated in terms of their practicability; the time and effort required by the student to respond to the test requirement should be justified in terms of the resulting measurement and learning.

71. Constructing Tests

a. Select Specific Objectives To Be Measured. The best sources of content material are the programs of instruction, lesson plans, and training publications used in the course. From these sources the instructor will select specific lesson objectives, which will provide the basis for his examination (see para 61). The examination must be constructed so that it will measure ability to apply and use the information and skills that have been taught. This requires that the course content be translated into terms of student behavior. A worksheet that lists lesson objectives and main teaching points, and how these are applied is especially helpful in test construction.

b. Develop a Test Outline. The test outline should show, as a minimum, the number of items to be used for each objective. It may also include the tentative plan for the use of various types of test items and performance requirements. As a general rule, the more important the objective, the greater the number

of test items that should be assigned to it. Since the test items usually are grouped by subject matter, the test outline can be used in assembling the final test. The test outline should be regarded as a worksheet subject to modification at any stage in the development of the final test.

c. Construct Test Items. The next step is that of constructing the test items and requirements. In preliminary phrasing of the test items, do not spend much time refining the wording; this can wait until later. Prepare 25 to 50 percent more items than the plan requires; this will permit selection of the best ones. Place each tentative test item on a card; this makes it easy to rearrange or discard items in setting up the final test. Do not be bound by the test outline; if it develops that a topic is better adapted to a type of question different from that shown in the outline, change the outline. Remember that the test will be no better than its individual items.

d. Assemble the Test.

(1) *General form.*

(*a*) The first page of each test should give a full identification and description of the test. This page should also give general instructions for taking the test; listing the texts and equipment, if any, that the students may need; giving the time allowed; and explaining the method of recording answers. These instructions should always be included, regardless of the student's experience with similar tests.

(*b*) Group items by types (multiple choice, true-false, etc.). Within each type, arrange the items so that those concerning related material appear together.

(*c*) Do not include an item that supplies, or is dependent upon, the answer to another.

(*d*) Arrange the items so that it will not be necessary for the students to refer to more than one page in answering any given item.

(*e*) Arrange the items so that the correct responses will form a random pattern.

(2) *Directions.*

(*a*) Directions for each type of question must be complete and concise, stating clearly what students are required to do, how the response or answer is to be indicated, and where the response is to be placed. If a separate answer sheet is to be used, the directions must so indicate.

(*b*) Examples should be included as part of the directions, showing at least one example of an item answered correctly. They may be used to teach certain points, as well as to direct student attention to the proper method of indicating responses.

(3) *Items.*

(*a*) Use as many items as possible that require the student to apply learning rather than merely to recall or recognize facts.

(*b*) Leave sufficient space for all responses where answers are to be indicated on the test.

(*c*) Include items at all levels of difficulty; this will tend to insure a significant range of test scores.

(*d*) Insure that each item is realistic and practical; each should deal with an important and useful aspect of the lesson. A good procedure is to determine first what information is desired, then write the desired response, and finally construct the test item from the response.

(*e*) Underline words that are critical to the meaning of the item.

(*f*) Avoid "catch" questions.

(*g*) Word questions in such a way that knowledge of the subject is required for the correct answer. Keep wording as simple as possible.

(4) *Answer sheets.* The use of an answer sheet eliminates the necessity for turning pages when marking the test, decreases the probability of errors in scoring, and makes possible the use of a templet for rapid scoring. Also,

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its use allows the student to retain the test booklet during the critique that should follow the examination; if this is to be done, the student should indicate his answers on the answer sheet and also mark his test booklet. Use of answer sheets for objective-type questions is efficient, but such sheets are not practical for essay-type questions requiring long answers. Instructor-made answer sheets should be similar to those used for machine grading, especially if the students are likely to use machine-graded answer sheets in other tests.

e. Review the Test.

(1) Ideally, an examination should be tried out on a cross section of the students who are to take it; however, this is seldom feasible. The next best plan is to give the test to a group of instructors and assistant instructors who are not directly concerned with the instruction covered by the test. This group should take the test just as the students do. A comparison of the time required by an instructor group to complete an examination with the time required by the students will help in determining time requirements for future examinations. Such tryouts also help to locate errors in questions or answers, "catch" questions, and ambiguous wording.

(2) A review board of instructors, or other personnel competent to pass judgment, should evaluate every test. Members of the review board should actually take the test, check the time required, and compare results; then the instructor should give out approved solutions and critique the test.

f. Prepare the Materials for the Test. These include copies of the test, solution sheets, scoring keys, and other such materials. The work in this step is mechanical and may be handled by clerk-typists, but it must be closely supervised by the instructor. The effectiveness of the test can be affected seriously by such things as lack of sufficient copies or a missing page in the examination booklet.

g. Revise the Test. If the test is to be administered to other classes, student responses should be studied carefully and every effort made to revise and improve the examination. One effective way to accomplish this is to place each item on an individual card that is classified according to course objectives, and to show on the card an analysis of past student performance on that item. Revisions of the item can be made on the card and performance analyses can be accumulated from class to class.

72. Preparing Written Test Items

a. Multiple-Choice Items. A multiple-choice item consists of two parts—a stem, which asks a question, states a problem, or takes the form of an incomplete statement; and several alternatives, which are possible answers to the question or problem posed, or grammatically correct completions of the stem. One alternative must be either the clearly best answer or the only correct answer. The other alternatives should be fairly plausible.

(1) *Examples.*

DIRECTIONS: Each of the incomplete statements or questions listed below is followed by several possible answers. From these, select the best answer for each test item, and mark the appropriate space on your answer sheet as shown in the example below. Points for each test item: 2.

EXAMPLES

X. In which general direction should a soldier go to follow a magnetic azimuth of 220°?

A. Northwest.
B. West.
C. South.
D. Southwest.

Note. The answer should be shown on the answer sheet in this manner.

A B C D

X. // // // ■

(2) *Characteristics of the multiple-choice test item.*

(*a*) The multiple-choice item can be designed to measure the student's ability to form judgments and make application of things learned.

(*b*) It can be used to measure what a

student can recognize, which represents a much wider field than what a student can recall.

(*c*) It can effectively present problems involving reasoning and judgment based on knowledge applied to situations, rather than memory for facts.

(*d*) It can be varied to suit many kinds of subject matter and to measure various types of achievement, such as command of fundamentals, application of principles, and formation of judgments.

(*e*) Its scoring is objective.

(3) *Points to be observed in constructing multiple-choice test items.*

(*a*) The stem of the item should contain a central problem. It should not be merely an incomplete statement that fails to present a problem.

1. Poor—no central problem.

X. When an absentee is dropped from the rolls of his unit
- A. his clothing will be secured and credited on his form 32.
- B. all persons notified of absence will be sent DD AGO Form No. 46.
- C. pay and allowances will cease.
- D. money left behind will be deposited with a disbursing officer.

2. Better—central problem presented.

X. An absentee who has been dropped from the rolls of his unit has left $30.00. With whom will the money be deposited?
- A. First sergeant.
- B. Company commander.
- C. Personnel officer.
- D. Disbursing officer.

(*b*) The stem should be sufficiently clear that an informed student could give a correct answer from the stem if it were written as a completion item with no choices given.

1. Poor—the stem does not clearly indicate what is desired.

X. The slippage and accuracy test on the azimuth indicator
- A. is performed by the tank crew.
- B. is performed by ordnance.
- C. is made by standard shop instruments.
- D. cannot be performed when the instrument is assembled.

2. Improved—stem asks specifically who performs the test.

X. The slippage and accuracy test on the azimuth indicator is performed by
- A. the tank crew.
- B. the turret mechanic.
- C. the tracked vehicle mechanic.
- D. ordnance shop personnel.

(*c*) The item should be realistic and practical. It should not be academic and artificial.

1. Poor—academic definition, textbookish. Soldier does not use knowledge in this manner.

X. A third-degree burn is defined as one in which the
- A. skin has been blistered.
- B. skin has been destroyed to a considerable depth but not completely destroyed.
- C. skin has been destroyed or charred.
- D. muscle tissue has been severely injured.

2. Better—practical problem. This item asks the soldier something he will *do*. He *uses* his knowledge.

X. A soldier is burned by a particle of white phosphorous. In treating his burn, he should first
- A. apply a bandage from a first aid kit.
- B. paint the burned area with iodine.
- C. flush the burn with water.
- D. apply a dressing of sodium bicarbonate.

(*d*) The item should deal with an important and useful aspect of the job. It should not deal with trivial details and useless information.

1. *Poor*—rarely used by the soldier. Not a useful aspect of his job.

X. A map with a scale of 1: 25,000 is a

A. large-scale map.
B. small-scale map.
C. medium-scale map.
D. medium-large scale map.

2. *Better*—a requirement for the soldier to use the map scale.

X. The distance in meters between point A (59801869) and point B (59631960) on your map is

A. 920.
B. 960.
C. 1,000.
D. 1,040.

(*e*) The item should present a problem that requires knowledge of the job or the instruction. Questions that can be answered on the basis of intelligence or general knowledge alone should not be included in this test.

1. *Poor*—requires only ordinary intelligence.

X. What is the main advantage of marching at night?

A. There is less strain on the eyes.
B. Men can go without food longer.
C. The enemy is less able to notice troop movements.
D. Troops can move more quickly.

2. *Better*—specific application of knowledge is required.

X. On night patrol you are caught in the light of a flare dropped from an enemy plane. The best thing for you to do is to

A. run for the nearest cover.
B. drop to the ground.
C. remain motionless where you are.
D. shoot at the plane.

(*f*) Each item should be an independent problem and should not reveal the answer to another item. The following two items, for example, are not independent; one gives the answer to the other.

X. When it is desired to know what test score will divide a group exactly in half, which measure of central tendency should be used?

A. Arithmetic mean.
B. Median.
C. Mode.
D. Geometric mean.

X. The median is a measure of

A. central tendency.
B. skewness.
C. dispersion.
D. kurtosis.

(*g*) The problem should contain only material relevant to its solution (unless selection of what is relevant is part of the problem). The underlined portion of the example below is not essential in the solution of the requirement.

X. You are a tank platoon leader, operating as a part of a company team that is participating in an exploitation in which armor elements are striking at objectives deep in the enemy's rear. You would elect to move your platoon in a line formation if you wanted to

A. have a formation easier to control than the wedge formation.
B. have good fire to the front and flanks.
C. have maximum fire to the front or rear.
D. Provide for a sustained effort.

(*h*) Do not include choices that are trivial, implausible, or obviously wrong. The distracters (wrong answers)

should be plausible answers representing common errors and misconceptions.

1. *Poor*—ridiculous distracters.

X. An important qualification for a truck driver is that he have

A. a knowledge of the history of transportation.
B. friends in the motor pool.
C. a license to drive a truck.
D. a good speaking voice.

2. *Better*—plausible wrong answers.

X. An important qualification for a truck driver is that he have

A. no accidents against his record.
B. no physical deficiencies.
C. a license to drive a truck.
D. 20/20 vision without glasses.

(*i*) The best answer should not be given away by irrelevant details. Avoid clues to the correct answers. The following examples are easily answered by reading alone, because of the clues that are written into each item:

1. Improper use of articles (a, an, the) in stem:

X. On a military map, a trail is shown by a

A. single broken line.
B. two parallel broken lines.
C. dots and dashes.
D. two parallel solid lines.

2. Common elements: This item gives away the correct answer.

X. The multiplier is a term used in

A. multiplication.
B. division.
C. addition.
D. subtraction.

3. Choices should be about the same length. A longer and more complete choice is usually correct.

X. The enemy is shelling your position in preparation for an attack. What should your squad do?

A. Retreat.
B. Attack.
C. Fire rapidly.
D. Take cover in previously prepared positions.

4. Choices should have parallel grammatical construction.

(a) Example of a lack of parallel construction of choices:

X. You are a platoon leader commanding the leading tank platoon, acting as an advance guard. You have just made contact with an enemy force. What is the first thing you should do?

A. Report the enemy situation to your higher headquarters.
B. The situation should be developed.
C. A course of action must be selected that will insure the accomplishment of your assigned mission.
D. Immediately deploy your platoon and inform your commander.

(b) Example of improved item: note that each choice parallels the others:

X. You are a platoon leader commanding the leading tank platoon, acting as an advance guard. You have just made contact with an enemy force. The first thing you should do is to

A. report the enemy situation to your higher headquarters.
B. develop the situation so as to determine enemy strengths, dispositions, etc.
C. choose a course of action that is appropriate and will insure the accom-

plishment of your mission.

D. deploy your platoon immediately and inform your commander.

(*j*) When a negative item is used, the negative word or phrase should be emphasized. Negative items should also be checked to be certain that a double negative has not been used. When a negative is used in the stem, a negative should not appear in the alternatives.

X. Which one of the following is *not* an example of a simple machine?

A. Wedge.
B. Crowbar.
C. Pulley.
D. Try square.

(*k*) Choices that are numerically or logically related in a sequence should be placed in proper order.

X. You are firing the caliber 7.62-mm coaxial machinegun at a ground target. What length bursts should you fire?

A. 5- to 10-round.
B. 10- to 20-round.
C. 20- to 25-round.
D. Continuous.

(*l*) Do not use blank spaces in the stem. Place the choices at the end of the statement. This makes for continuity of reading and is less confusing for the student.

1. Poor.

X. The _____ flag(s) should be displayed when a misfire has just occurred in your tank.

A. red and orange.
B. green and orange.
C. orange.
D. red and green.

2. Better.

X. A misfire has just occurred in your tank. What flag(s) should be displayed?

A. Red and orange.
B. Green and orange.
C. Orange.
D. Red and Green.

(*m*) Place words or phrases that are common to all alternatives in the stem.

Poor—words *underlined* should have been included in the stem.

X. Ground-controlled approach is designed for

A. directing aircraft for landing operations.
B. directing aircraft for climbing to altitude.
C. directing aircraft for taking off.
D. directing aircraft for formation flying.

(*n*) Do not weight items differently within the same section of the test. If more weight is desired for a certain objective, include more items on it.

(*o*) Include at least 4, but not more than 5, alternatives or possible responses.

(*p*) When several items have the same alternatives, consider using a matching type item.

(*q*) Do not use absolute words such as all, none, never, always.

b. True-False Test Items. The true-false test item consists of a simple statement which students must identify as true or false.

(1) *Examples.*

DIRECTIONS: Listed below are a number of statements; some are true and some are false. If any part of a statement is false, the entire statement is false. Make your decision with regard to each statement, and mark the appropriate space on the answer sheet. The first item is answered as an example. Points for each test item: 1.

X. The principal advantage in the use of radio as a means of communication is secrecy.

Note. The answer would be shown on the answer sheet in this manner.

T F

X. // ▰

1. FM radios cannot net with AM radios.

T F

Answer: 1. ▰ //

(2) *Characteristics of the true-false test item.*

(*a*) The true-false item can be used effectively as an instructional test item to promote interest and to introduce points for discussion.

(*b*) It can effectively sample wide ranges of subject matter.

(*c*) It is easily and objectively scored.

(*d*) It can be made a factual question or a thought question that requires reasoning.

(*e*) It is difficult to construct items that are completely true or false without making the correct responses obvious.

(*f*) It is difficult to eliminate guessing.

(3) *Points to be observed in constructing the true-false test item.*

(*a*) Make approximately one-half of the items true and one-half false.

(*b*) Do not make the true statements consistently longer than the false statements, or vice versa.

(*c*) Limit each statement to one main idea or point.

(*d*) Avoid negatives and involved statements.

(*e*) Make application of things learned in as many of the items as possible.

(*f*) Avoid using such words as *all, none, never,* and *always.*

(*g*) Where possible, make the crucial element come near the end of the statement.

c. Matching Test Items. The matching type of test item includes two lists of columns of related topics such as words, phrases, clauses, or symbols. Students are required to match each item in one list with the item in the other list to which it is most closely related.

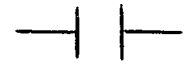
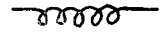
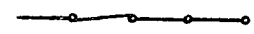
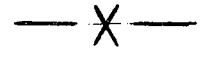
(1) *Examples.*

DIRECTIONS: Column II below lists electrical symbols. Column I lists the names of some of these symbols. Mark in the appropriate space on your answer sheet the letter of the symbol in column II for each item named in column I. Use each symbol only once. Points for each correct answer: 2. The first item would be answered on the answer sheet as shown below, because the symbol for a battery is that of letter H in column II.

Answer Sheet

A B C D E F G H I J K L M N O

X. // // // // // // // ■ // // // // // // // //

COLUMN I		COLUMN II	
	Names		Symbols
X.	Battery	A.	
1.	Inductance	B.	
2.	Resistance	C.	
3.	Antenna	D.	
4.	Fuse	E.	
5.	SP switch	F.	
		G.	
		H.	

* * * * * * *

DIRECTIONS: The forms of tests are listed in column II. Several training objectives are listed in column I. Match each training objective with the form of test that would provide the best evaluation. Each item in column II may be used more than once.

COLUMN I	COLUMN II
____ 1. Pride in being a soldier.	A. Oral
____ 2. Knowledge of military map symbols.	B. Written
____ 3. To spot-check class understanding of a teaching point that you have just explained.	C. Performance
____ 4. Ability to time a a gasoline engine.	D. Observation
____ 5. Ability to recognize US Army insignia of grade.	
____ 6. Ability to solve problems using Ohm's law, E = IR.	
____ 7. Respect for safety regulations.	

(2) *Characteristics of the matching-type test item.*

(*a*) This type of test item is especially valuable for testing student ability to recognize relationships and make associations.

(*b*) The matching exercise may require students to match—

1. Terms or words with their definitions.
2. Characteristics with the mechanical units to which they apply.
3. Short questions with their answers.
4. Symbols with their proper names.
5. Descriptive phrases with other phrases.
6. Causes with effects.
7. Principles with situations in which the principles apply.
8. Parts or mechanical units with their proper names, or parts with the units to which they belong.

(*c*) A large number of responses can be obtained in a small space and with one set of directions.

(*d*) It can be made totally objective.

(*e*) The student can complete it quickly, and it is easy to score.

(*f*) It tends to be highly reliable and discriminating.

(*g*) Since the phrases or clauses must necessarily be short, the matching exercise provides a poor measure of complete understanding and interpretations.

(*h*) It is generally inferior to the multiple-choice item in measuring judgments and applications of things taught.

(*i*) It is likely to contain irrelevant clues to the correct response; the instructor may have difficulty in eliminating such clues.

(3) *Points to be observed in constructing matching items.*

(*a*) Require students to make at least 5 and not more than 12 responses in completing each matching exercise.

(*b*) Include at least three extra items from which responses must be chosen or allow responses to be used more than once. This tends to reduce the possibility of guessing or answering by a process of elimination.

(*c*) Include only homogeneous or related materials in any one exercise.

(*d*) Place the column containing the longer phrases or clauses on the left-hand side of the page. Require students to record their responses at the left of this column. This makes the process of selection easier.

(*e*) Include a least three plausible responses from which each correct response must be selected. If, in order to do this, it is necessary to include three times as many items in one column as in the other, use some other type of test item.

(*f*) In setting up the test make sure that all of a given matching exercise appears on one page.

(*g*) List nothing in either column that is not a part of the subject in question.

(*h*) Make the directions specific. State in the directions the area of instruction to which the things listed apply.

d. Identification Test Items. The identification-type test item is used to measure student ability to recall the proper names of things.

(1) *Example.*

DIRECTIONS: In the numbered blanks to the left of the symbols shown below, write the name of the object represented by each symbol.

1. _____

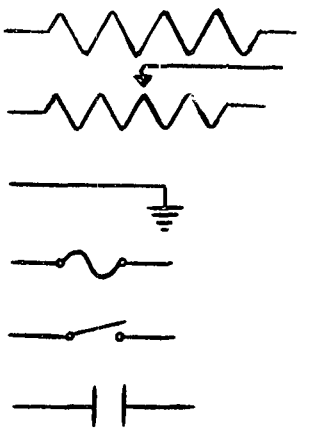
2. _____

3. _____

4. _____

5. _____

6. _____



(2) *Characteristics of identification test items.*

(*a*) The identification item can be substituted for the matching when it is desired to have students recall outright the proper names.

(*b*) It can be made to measure the application of certain knowledges, as in detecting the errors in a drawing.

(3) *Points to be observed in constructing the identification test item.*

(*a*) Make all sketches clear and of sufficient size.

(*b*) Make sure parts to be named are clearly indicated.

(*c*) Wherever practical, display the actual parts of units instead of using sketches.

(*d*) If the actual parts of units are to be displayed, place the identification items at either the beginning or the end of the test.

(*e*) Have a good sample of the item to be identified.

(*f*) Make sure that only one definite answer is possible.

e. Listing or Enumeration Test Items. The listing or enumeration test item requires students to supply a list of terms, rules, or factors that have been taught and emphasized in a given course. Students may or may not be required to list the items in a particular order.

(1) *Example.*

DIRECTIONS: Read each item carefully. Follow in every detail the directions given with each.

In the blank spaces provided, list four aids that are helpful in identifying objects or features on an aerial photograph.

1. Color. _____

2. Shape. _____

3. Shadow. _____

4. Size. _____

(2) *Characteristics of the listing test item.*

(*a*) The listing or enumeration test item can be used to measure degree of recall of highly specific points of information.

(*b*) It allows a degree of freedom of expression.

(*c*) It minimizes the possibility of guessing the correct response.

(*d*) Its use tends to place too much emphasis upon memorizing facts and details.

(*e*) It does not readily measure the individual's ability to use or interpret information.

(*f*) Its scoring tends to become somewhat subjective.

(3) *Points to be observed in constructing listing or enumeration test items.*

(*a*) Design the item so that it will call for specific facts.

(*b*) Each thing to be listed should involve only a few words. Students should not be required to list long, involved statements. Scoring these becomes subjective.

(*c*) Rarely should one question call for more than 6 or 8 items to be listed.

(*d*) Do not use this item if students can choose from a great variety of possible answers to supply responses. That is, do not call for 5 items out of a list of 15 taught in the course; to do so would place all students who listed 5 items in the same category and indicate that each had achieved equally with regard to the 15 points in question. Such a listing item would be very low in discriminating power. Make every effort to design items that will detect differences in achievement.

(*e*) If students are required to list things in a given order, determine, before the test is given, how the responses are to be scored. The nature of the subject matter should be considered in establishing a method of scoring.

f. Completion Test Items. The simple completion item requires students to recall and supply one or more key words that have been omitted from statements. The words, when placed in the appropriate blanks, make the statement complete, meaningful, and true. The statements may be isolated and more or less unrelated, or they may be combined to form short paragraphs that carry a continuous line of thought.

(1) *Example.*

DIRECTIONS: A blank space is found in each of the following incomplete statements; write the word(s) in each blank that will make that particular statement complete and true. The first blank is filled in as an example.

X. The breaker points open and close the primary circuit.

1. The ammeter is connected in _____.

2. The cam angle is the number of degrees through which the cam revolves while the points are _____.

(2) *Characteristics of the completion test item.*

(*a*) The simple completion item can be used to test student ability to recall specific facts; it demands accurate information.

(*b*) It can be used effectively to sample a wide range of subject matter.

(*c*) The paragraph form can be used to test continuous thought within a specific area of subject matter.

(*d*) It has high discriminating value.

(*e*) It is difficult to achieve objectivity.

(*f*) It tends to measure verbal facility and memorization of facts rather than application.

(3) *Points to be observed in constructing simple completion-type test items.*

(*a*) Omit no more than three words in a given sentence. Leaving too many blanks makes it necessary for students to memorize entire statements. A short statement with only one word omitted is preferable.

(*b*) Place the blanks near the end or at least past the center of the sentence. This makes for continuity when reading the statement.

(*c*) Design each statement in such a manner that it will remain incomplete until the correct response is inserted.

(*d*) Omit only key words, not insignificant or trivial ones.

(*e*) Do not copy statements directly from textbooks to make completion items.

(*f*) It is usually poor practice to omit verbs.

(*g*) If possible, construct the item so that there can be only one correct response.

(*h*) If synonyms are to be accepted, include them in the key.

g. Essay Test Items. In the essay test item, students are required to make a comparison, write a description, or explain certain points.

(1) *Examples.* Following are 2 examples of essay questions and comments about each example.

X. How should paint brushes be cared for?

Discussion: This question was easy to write. The instructor undoubtably had some important and definite points in mind when he wrote the question, yet he has left the student to guess at what is wanted. Does this mean caring for the brush in use at the end of a day's work—or when preparing the brush for storage? Suppose the item is worth 10 points. What answer would the instructor accept as being worth 10 points? What answer would be worth 8 points? What answer worth 4 points? Would 2 or 3 instructors agree on the number of points to be given a particular answer?

X. You have finished painting the exterior of your barracks and the brushes are to be prepared for storage until you are ready to use them again.

(1) What is your first step in removing the paint from the brush? 2 points.

(2) How would you remove hardened paint from upper bristles without injuring the brush? 2 points.

(3) What cleaning material would you use to remove the paint completely from the brush? 2 points.

(4) What steps would you follow in using this material? 2 points.

(5) How would you dry the brush? 2 points.

Discussion: Putting the item in the form illustrated requires much more thought on the part of the instructor than writing it in the first form. With the second form, however, the student knows exactly what is wanted. He must supply definite information, and he cannot cover up lack of information by writing a wordy but vague answer. Also, the instructor need not spend time in analyzing a long answer, and the number of credits to be given any answer can be quickly, uniformly, and accurately determined.

(2) *Characteristics of the essay test item.*

(*a*) The essay item can be used effectively to measure student ability to organize and express thoughts.

(*b*) It can be used to measure complete understanding of certain points.

(*c*) Its greatest disadvantage is that its scoring may become subject to the instructor's interest and range of knowledge and other similar factors.

(*d*) Responding to the essay item requires much student time.

(*e*) Scoring the item requires much more time than is required for other types.

(*f*) Only a relatively few points can be covered by essay items. Poor sampling of the subject matter may result.

(*g*) It provides students an opportunity to bluff.

(*h*) Men who know subject matter well, but are not skilled in writing, may be penalized on an essay examination.

(3) *Construction of essay test items.*

(*a*) Call for specific answers. Word the item in such a manner that it provides the student with an outline that he can follow in formulating his response.

(*b*) State the item in a simple, direct manner.

(*c*) Allow one point for each significant idea or fact expected in the response.

(*d*) Design the essay item to require students to compare, explain why, give a reason, describe, or explain how, rather than to name, list, or enumerate.

(4) *Scoring essay test items.* Essay test items are difficult to score.

The following points will help in scoring.

(*a*) Write the answer expected for each item. Include every point that is to be accepted.

(*b*) Score one essay item on all the test papers before proceeding to the next.

(*c*) Give value to an item by allowing one unit of credit for each point covered in the answer.

(*d*) Do not deduct points for grammatical errors, handwriting, or other deficiencies unless these are desired outcomes of the instruction. Score answers on basis of content.

(*e*) Use code numbers instead of names on the student's papers. This is particularly important in cases where instructors are personally acquainted with the students.

h. Situation-Type Tests. Test questions are often very effectively presented through the use of situations and requirements. This is not, strictly speaking, a form of test item, but rather a manner of presenting various types of questions. The situation and requirements may be followed by essay, listing, or any other type of test item. The test, in most cases, is hand-graded, and it is not necessary to group items according to the types used. The instructor uses the type of test item that will best measure the material covered by the requirements.

(1) *Characteristics of the situation-type test.*

(*a*) The situation-type test can be used effectively to measure the students' ability to make application of things learned. It is one of the most valuable tests for this purpose.

(*b*) It can be varied or adapted to various kinds of subject matter.

(*c*) Making this type test objective is sometimes difficult.

(*d*) Although highly valid, it must be carefully constructed and scored.

(2) *Points to be observed in constructing the situation item* (see para 49).

(*a*) Make the item as specific as possible.

(*b*) Construct the item in such a manner that it requires the student to solve a problem.

(*c*) Methods of indicating the responses will vary. Include specific directions for recording the response in directions for each requirement. Do not attempt to write one set of directions to fit all situations.

(*d*) State the problem or describe the situation clearly and concisely. Use sketches wherever possible.

(*e*) Avoid basing the solution of one problem on the response to another.

73. Constructing Performance Tests

a. General. The performance test is considered to be the most valid measure of a student's ability to actually perform certain military tasks; however the instructor must recognize that this type of test is relatively difficult to construct and to administer. Some of the problems that must be solved are—

(1) The performance test requires careful analysis of lesson objectives in its construction, thorough planning, and adequate personnel and equipment support.

(2) Administration of the test requires considerable time. One instructor usually is required to check 1 student at a time; in some cases, however, he may check from 2 to 5.

(3) There is the problem of making profitable use of the time by students who are waiting their turn or who have finished. This can be solved in some cases by use of a county fair arrangement (fig. 81), where a number of stations are used and students rotate through them. Another solution is the use of concurrent training activities for students awaiting their turn.

(4) Instructors and assistants must have a fairly high level of training, and in most tests a relatively large number of administrative personnel are required.

(5) In some cases the formality of the test tends to penalize the student who ex-

periences difficulty when he works under pressure.

b. Construction. The following procedures and suggestions should be followed in the preparation of performance tests:

(1) Select the lesson objectives that should be measured by some form of performance test.

(*a*) Select operations that require the student to do something that has been taught. If the objective is "Be able to place the radio in operation," it is best to measure this ability by means of a performance-type test.

(*b*) Select operations that are sufficiently difficult to reveal differences in achievement. Operations that are too simple and are performed equally well by all students are not suitable for test purposes.

(*c*) Select operations that involve definite steps of procedure and require definite knowledge and abilities.

(*d*) Select operations that can be performed in a relatively short time.

COMPANY A
34th ARMOR
Fort Knox, Kentucky

MAIN BATTLE TANK

Performance Test Checklist

NAME_____ CLASS_____
(Last) (First)

Note. Check yes or no with an X in the proper space.

Did the student:	Yes	No
1. Check for a broken torsion bar?		
2. Check track tension, using the proper procedure?		
3. Find an oil plug missing on the roadwheel?		
4. Find a roadwheel lug nut loose?		
5. Find a track pad missing?		
6. Find a sprocket cap screw loose?		
7. Find a track pin nut missing?		
8. Find a cap screw missing on the idler hub cap?		
9. Find the adjusting link lock nut loose?		

INSTRUCTOR'S NAME_____ SCORE_____

Figure 79. Checklist for performance test.

Long and complicated operations requiring more than 10 or 15 minutes often do not make good performance test tasks.

(2) Make an analysis of the lesson objectives selected for inclusion in the test. Determine what the step-by-step procedures are. This analysis may have already been accomplished when the instruction was prepared. The test construction requires that these procedures be reviewed and organized from the standpoint of measurement.

(3) Design an appropriate task in which the objectives are specifically applied.

(4) Construct a checklist (fig. 79).

(5) Prepare a set of directions and instructions (figs. 80 and 81) to be followed by the student, including:

(*a*) Purpose of the test.

(*b*) Exactly what the student is to do in the test.

(*c*) Major factors considered in the grading of performance (7, fig. 81).

COMPANY A
34th ARMOR
Fort Knox, Kentucky

MAIN BATTLE TANK

Performance Test

1. INSTRUCTIONS

a. The instructor at this station will observe your performance and make notations on a checklist.

b. Do not attempt to correct any deficiencies.

2. SITUATION

A main battle tank has just returned from a field problem. The vehicle was coasted to a stop without use of brakes or steering.

3. REQUIREMENT

a. Perform an after-operation inspection of the track and suspension system.

b. Inform the instructor of any deficienices detected during this inspection.

Figure 80. Instructions to students for a performance test.

(6) Prepare directions for the conduct of the test (5, fig. 81). These should be complete, so that a new group of instructors could administer the test satisfactorily. Sketches of the setup and all details should be included (2, 3, 4, fig. 81). These directions are written in the lesson plan for the test.

(7) Dry-run the test. This is a must for a performance test.

74. Observation Techniques

a. Uses and Advantages.

(1) Observation techniques are used not only in administering performance tests, but also in evaluating certain outcomes of instruction, such as leadership and student attitudes which cannot be readily evaluated by means of formal tests.

(2) To be effective, observation must be based upon thorough preparation. It is a process requiring the directed attention of the observer. The more thorough the preparation, the clearer the understanding of what is to be observed and the more reliable the final evaluation.

PRELIMINARY GUNNER'S TEST

GENERAL INSTRUCTIONS

1. ORGANIZATION OF TEST
   a. Station 1--Disassembly, assembly, and head space adjustment. 25 points.
   b. Station 2--Prefiring checks. 10 points.
   c. Station 3--Care and cleaning. 25 points.
   d. Station 4--Malfunctioning. 10 points.
   e. Station 5--Inspection of ammunition. 10 points.
   f. Station 6--First phase of immediate action. 10 points.
   g. Station 7--Second phase of immediate action. 15 points.
   h. Station 8--Break station. 0 points.

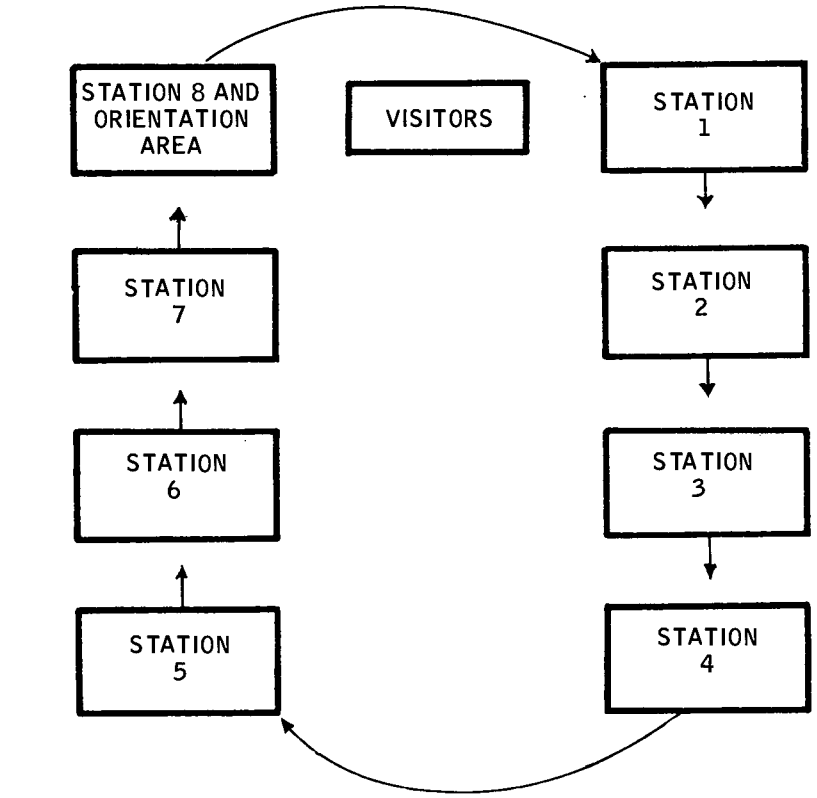
2. DIRECTIONS TO STUDENTS
   a. This is a graded exercise requiring individual work. Do not discuss test requirements with anyone until the test is completed.
   b. Stay in your assigned group throughout the test.
   c. Rotate in a clockwise direction from your starting station, on signal of the whistle, until you have completed every station.
   d. At each graded station, you will be given a written situation and requirement that explains what you are to do.
      (1) Read and understand the requirement; the assistant instructor will answer questions on what you are to do, not how to do it.
      (2) Execute the requirement. The assistant instructor will grade you on your performance. If you cannot complete the requirement, ask for help. After cutting the required number of points, the assistant instructor will show you the step that is troubling you.
      (3) After you complete the requirement, the assistant instructor will critique your performance and record your grade on your student performance score sheet.
      (4) If you have a complaint about your grade, do not argue with the assistant instructor, but bring your complaint to the immediate attention of the principal instructor. No reclama will be accepted after you have left a test station.
   e. When you arrive at the break station, you may take a break. If you have missed a station, you may return to that station after clearing with the principal instructor.
   f. After completing all 7 graded stations, turn in your completed student performance score sheet to the principal instructor and return to the stand for review.

①

Figure 81. "County fair" performance test.

PRELIMINARY GUNNER'S TEST

SKETCH OF TEST AREA



Note. Maintain at least 20 yards between test stations.

②

Figure 81—Continued.

(3) Observation of students in their performance of practical work enables the instructor to check the results of his teaching and take corrective measures where needed.

(4) On a more advanced level, the observation of students operating as members of teams or as staff officers provides a check on important instructional outcomes.

(5) Outcomes such as ability to get along with people, consideration for others, initiative, willingness to work, and cooperation can be evaluated only through the use of observation techniques.

(6) Observation of instructors by supervisors using a check sheet similar to figure 83 is a good means of evaluating instructors.

b. Limitations. The major limitation of this type of evaluation is the lack of objectivity that often results when the instructor fails to use proper techniques in observing student performance. The problem is not one of reducing the use of the instructor's judgment as a measurement of student progress, but that of increasing the validity and objectivity of his ob-

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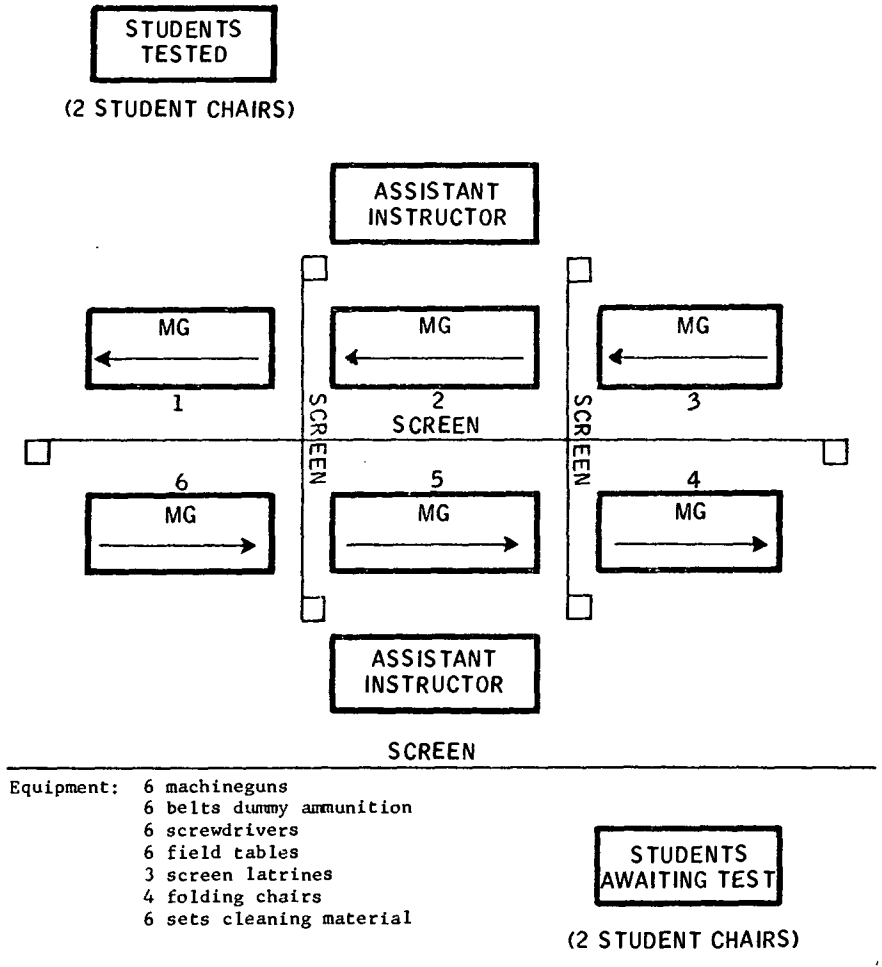
PRELIMINARY GUNNER'S TEST

STATION NUMBER 1



③

Figure 81—Continued.

servations. Some of the common faults that may enter into this type of evaluation if the instructor does not use proper techniques are—

(1) The instructor may fail to keep the objectives of the course clearly in mind when he determines what to observe.

(2) There may be a variation in standards from one instructor to another.

(3) The instructor may not give sufficient attention to specific aspects of the student's performance.

(4) There is sometimes a tendency to give high ratings to students who appear to be busy, without examining their work critically. These first four contribute to the "error of standards."

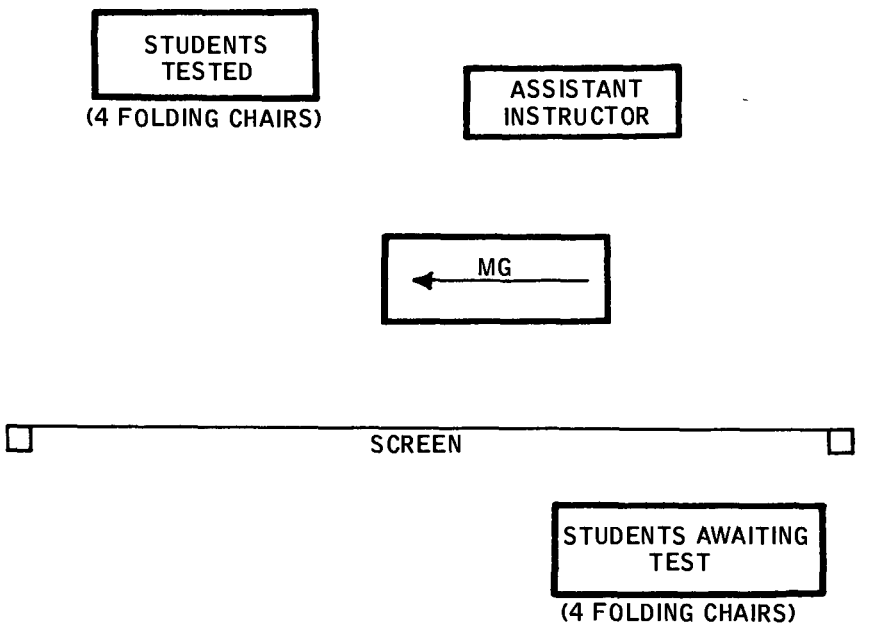
(5) In some cases, high grades made in other phases of the course tend to influence the instructor's ratings. This is the "halo" error.

(6) There is also a tendency to rate all elements on the checklist the same or approximately the same. This is the "central tendency" error.

(7) At times, there is a tendency to try to rate too many elements. If the check-

PRELIMINARY GUNNER'S TEST

STATIONS 2 THROUGH 7



Equipment: 1 machinegun
1 screwdriver
1 belt dummy ammunition
1 screen latrine
8 folding chairs
6 sets cleaning material

④

Figure 81—Continued.

list is too complicated, the rating will suffer.

(8) The instructor may tend to overrate likeable students.

(9) At times, there may be a tendency to rely too much upon recent observations and neglect the complete record of observations. This will contribute to the so-called "logical error."

c. Observation Principles. The instructor who uses observation techniques (fig. 82) effectively will apply certain basic principles. The following procedures will provide excellent guidance:

(1) Select phases of conduct that provide evidence of the quality being judged. If, for example, the problem is to evaluate students on leadership, the observer must see the students in situations that permit them to demonstrate their leadership, such as giving commands, directing activities of a small unit, and making executing decisions. Similarly, to judge a student's ability as an instructor, he must be observed as he handles classes under varying conditions.

(2) Define the points to be observed. Each point must be clearly and accurately defined in terms of student behavior, so that there will be no misunderstandings or ambiguities. Everyone

PRELIMINARY GUNNER'S TEST

DIRECTIONS TO ASSISTANT INSTRUCTORS

1. Upon arrival of students at your station, read the instructions as outlined by your performance test sheet.

2. After students have received the initial orientation, let them move away from the table far enough so that none of the other students can hear their answers. Then, have students come up to the table one at a time.
Note. Station no. 1 will test 6 students at a time. Assistant instructors (AI) at that station will ensure that tables are divided by a screen.

3. After a student performs his task, grade his score sheet and return it to him.

4. While test is being administered, fill out a checklist on each student. Keep checklist and turn it in after test period to principal instructor.

5. Upon completion of the task give each student a brief critique on his performance.

6. Each station is allotted 25 minutes to test each group of students. The first 2 minutes are for orientation; the next 20 minutes for testing, and the last 3 minutes for critiquing the students.

7. Ensure that all equipment for your station is obtained from the principal instructor and set up properly.

8. The break station assistant instructor will check each student's score sheet to ensure that he has not missed a station. In the event a student has missed a station, the AI will send the student to that station to complete the requirement of that station.

9. Each assistant instructor will run his station as outlined in the performance test for his particular station. Each AI will have a copy of the performance test and the performance test checklist in his possession at all times. Under no circumstances will either of these be given to a student.

10. If a student requests help, show him the step that he cannot perform; then give him a 0 for that part of the requirement and allow him to continue. Do not give him help unless it is specifically asked for.

11. In event of a disagreement over grading, do not argue with a student, but refer him immediately to the principal instructor.

⑤

Figure 81—Continued.

concerned in the evaluation must think of the factors in the same way.

(3) Define the standards of performance or conduct. It is not enough simply to look over a situation or watch students at work. The observer must know exactly what standards are to be expected as the student actually does the job. Work habits must be evaluated in terms of their field use. These standards should be reviewed by several officers with varied backgrounds to insure their validity.

(4) Make the observations comprehensive. Avoid evaluating personnel on the basis of a few characteristics. All important characteristics must be considered.

(5) Observe accurately and impartially. An observer must be alert to all that is happening. He must avoid letting his opinions or biases influence his judgments; fatigue or emotional upsets should not enter the evaluation.

(6) Make an accurate record immediately. Memory is too fleeting to be trusted

PRELIMINARY GUNNER'S TEST

DISASSEMBLY, ASSEMBLY, AND HEAD SPACE ADJUSTMENT, MACHINEGUN

Performance Test Station 1

1. INSTRUCTIONS
   a. The instructor at this station will observe your performance and make notations on a checklist.
   b. After you have completed your task he will grade your score sheet.
   c. The grade given by the assistant instructor is final.
   d. Ask any question you may have before commencing the exercise.

2. SITUATION
   a. Phases I and II--a machinegun has just been brought into your unit. You are inspecting it to make sure it is complete.
   b. Phase III--a machinegun has just been cleaned, and you are preparing it for firing.

3. REQUIREMENT
   a. Phase I--perform disassembly to the extent required for ordinary cleaning and minor repairs in the field.
   b. Phase II--assemble the weapon.
   c. Phase III--demonstrate and explain the correct head space adjustment.

⑥

Figure 81—Continued.

in making important judgments. A complete record of the observation, notes on a checklist, or ratings made at the time or immediately after the observation are necessary to make the judgment valid.

(7) Combine judgments of several competent observers. Repeated observation increases the probability that all important factors will be considered.

(8) Use standardized forms when available. A standard list of questions to be used in interviews, a checklist for observation of performance, or a rating scale based on the consensus of competent judges insures that attention will be paid to the important phases.

d. Rating Scales. (See fig. 83 for a typical rating scale.) The rating scale is frequently used to obtain an overall evaluation when observation techniques are used. An instructor may find that a rating scale constructed to meet

PRELIMINARY GUNNER'S TEST

DISASSEMBLY, ASSEMBLY, AND HEAD SPACE ADJUSTMENT, MACHINEGUN

Performance Test Checklist, Station 1

CODE NUMBER_____

Note. Check yes or no with an X in the proper space.

Phases I and II

Did the student:	Yes	No	Points
1. Clear the weapon before disassembly?			1
2. Remove the groups to the extent required for ordinary cleaning and minor repairs in the field?			4
3. Disassemble and assemble the bolt?			4
4. Disassemble and assemble the lock frame?			4
5. Disassemble and assemble the barrel extension?			4
6. Assemble the machinegun?			4
Phase III			
7. Explain what head space is?			1
8. Explain why head space must be adjusted?			1
9. Demonstrate the correct procedure for adjusting head space?			1
10. Check the machinegun for firing?			1
Total Points			25

INSTRUCTOR'S NAME_____SCORE_____

⑦

Figure 81—Continued.

the immediate requirements of his situation will improve his observation and evaluation. In such cases, he should construct his own rating device, using the following procedure:

(1) *Step 1.* This first step is the same as that for constructing any other measuring instrument—determine the objectives and carefully define them in terms of observable behavior. An objective may be to rate an NCO's effectiveness in a particular duty assignment, to measure the achievement of a student in performing a particular task, or to determine the proficiency of a student in applying what he has learned.

(2) *Step 2.* Select the traits or factors that determine success or failure. This step usually requires careful study of the job that the man is, or will be, performing. In a scale to determine the effectiveness of a noncommissioned officer, five major performance factors might be used—(1) job knowl-

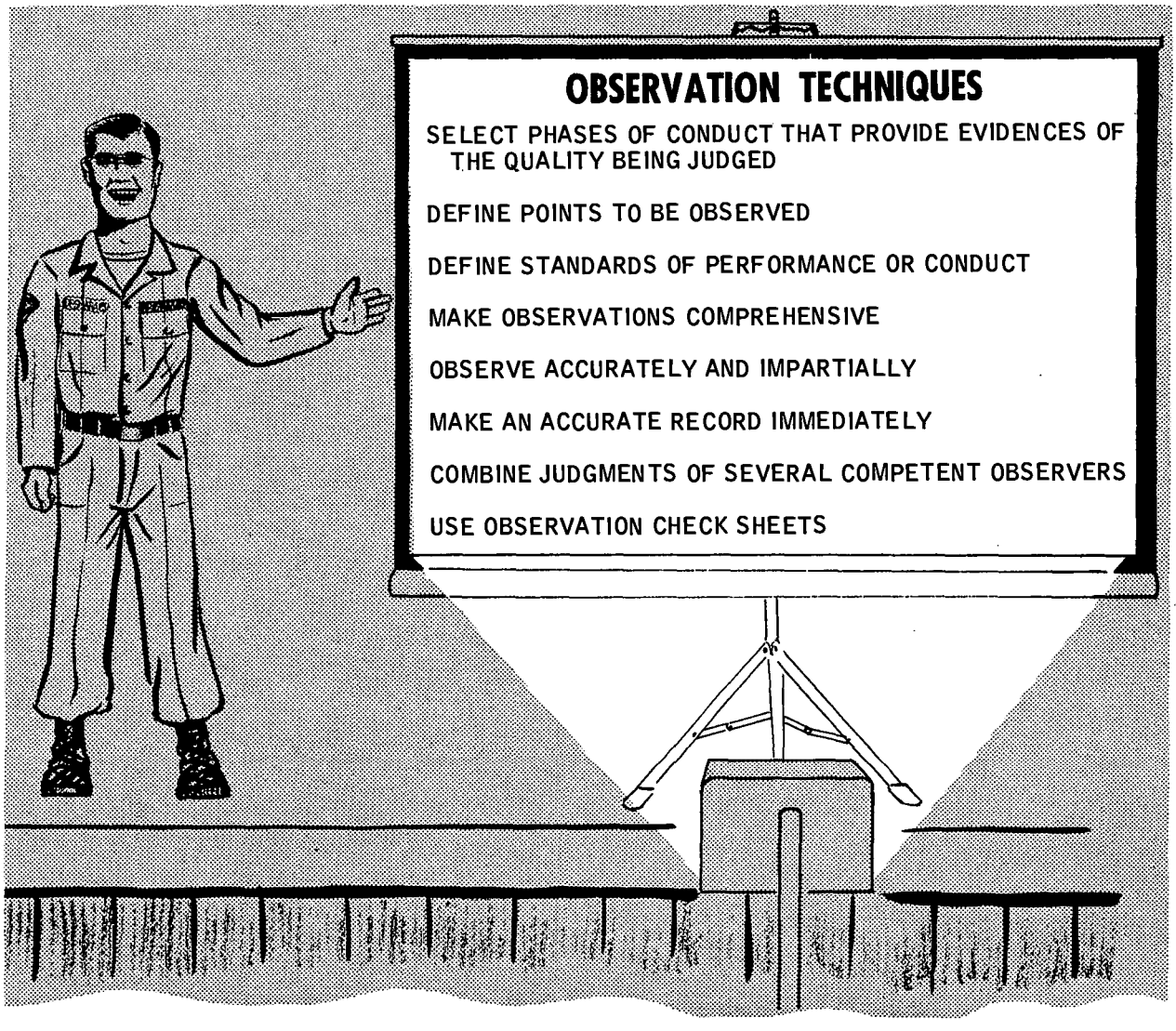


Figure 82. Techniques of observation.

edge, (2) cooperation, (3) judgment, (4) personal responsibility, and (5) leadership. The following are some rules to observe in selecting factors that determine success or failure:

(*a*) Select only critical factors or elements for rating. If promptness is not a factor in determining a degree of proficiency, do not include it. On the other hand, if promptness is essential, the validity of the scale would be lowered if it were not included.

(*b*) Select factors or elements to be rated that can be defined in terms that have the same meaning for all observers.

(*c*) Select factors or elements to be rated that are specific rather than general.

(*d*) Use about 7 factors; however, the number may vary from 3 to 12 or more.

(*e*) After studying the scale, eliminate those factors that do not differentiate.

(3) *Step 3.* Define the factors or items in clear terms. Definitions should be

phrased in terms of specific observable behavior.

(4) *Step 4.* Determine from 5 to 9 degrees of attainment for each factor or item. The phrases describing degrees of the trait generally are arranged in increasing or decreasing order. Note that 6 degrees of attainment are used in figure 83. Sometimes random arrangement is used to reduce halo and central tendency errors of rating.

(5) *Step 5.* Determine the importance of each factor and weight it accordingly. It is not likely that all factors are of equal importance. The weight given each factor can be determined by pooling the opinions of several observers thoroughly familiar with the situation. These weights should be examined after the scale has been used. Then it will be possible to determine if the ratings actually differentiate between

NAME

SUPERVISORY CHECK SHEET

INSTRUCTOR _____ CLASS OR DEPT _____

TITLE OF LESSON _____ FILE NR _____

CRITIC _____ RATING _____

REPORT SUBMITTED BY _____ RATING _____

DIRECTIONS: 1. Rate subtopics under Elements To Be Rated

\+ Plus for performance above average.

√ Check for performance which is average.

— Minus for performance below average.

2. Rate each Element To Be Rated on the Rating Scale by circling the number which best describes the over-all performance for that element. The numbers have the following meanings:

6. Outstanding
5. Superior
4. Excellent
3. Very Satisfactory
2. Satisfactory
1. Unsatisfactory

3. Write comments to justify your rating of each element of the lesson. List major strengths and make recommendations for improvement.

MAJOR STRENGTHS

CLASS OR DEPT

Figure 83. Supervisory check sheet.

ELEMENTS TO BE RATED	RATING SCALE
INTRODUCTION	
Objective	☐ 6 | 5 | 4 | 3 | 2 | 1
Reasons	☐
Contact	☐
Interest	☐
EXPLANATION—DEMONSTRATION	
Organization Easy to Follow	☐ 6 | 5 | 4 | 3 | 2 | 1
Clear Explanation of Points	☐
Emphasis of Key Points	☐
Material Vitalized	☐
Transitions	☐
Summaries	☐
Demonstration	☐
INSTRUCTOR QUALITIES	
Appearance & Bearing	☐ 6 | 5 | 4 | 3 | 2 | 1
Poise & Confidence	☐
Mannerisms	☐
SPEECH TECHNIQUES	
Volume—Use of PA	☐ 6 | 5 | 4 | 3 | 2 | 1
Rate	☐
Fluency	☐
Phraseology & Usage	☐
Contact with Class	☐
Force and Enthusiasm	☐
Enunciation & Pronunciation	☐
Gestures	☐
USE OF TRAINING AIDS	
Selection of Aids	☐ 6 | 5 | 4 | 3 | 2 | 1
Use of Aids	☐
Use of Pointer	☐
Smoothness	☐
Blackboard Work	☐
CLASS PARTICIPATION	
Student Participation	☐ 6 | 5 | 4 | 3 | 2 | 1
Characteristics of Questions	☐
Techniques	☐
Answers to Student Questions	☐
Application	☐
Examination	☐
REVIEW & CRITIQUE	
Questions Cleared Up	☐ 6 | 5 | 4 | 3 | 2 | 1
Summary	☐
Closing Statement	☐
PREPARATION	
Command of Subject	☐ 6 | 5 | 4 | 3 | 2 | 1
General Plan for Lesson	☐
Material on Level of Class	☐
Signs of Rehearsal	☐
Timing	☐

Assigned Length_____ Min Time Start _____ Time End _____ Total _____ Min

Figure 83—Continued.

those who are effective on the job from those who are ineffective. Weights need not to be shown on the scale. For example, the weights used with the scale shown in figure 83 are printed on an overlay so that they can be used *after* the scale has been completed by the observer, thus increasing the objectivity of the rating.

(6) *Step 6.* Devise format that facilitates use of rating scale.

(7) *Step 7.* Use the rating scale only in situations for which it was intended.

(8) *Step 8.* After using the scale on from 50 to 100 people, examine the reliability of the scale.

75. Administering Tests

a. Need for Careful Administration. The results of tests that are improperly administered, or poorly constructed, give instructors an incorrect impression of the degree of student learning. Students must be given every opportunity to do their best on an examination. If a man gets a low score because he misunderstood instructions or was fatigued or emotionally upset, his score is not a true indication of his ability. Likewise, a high score resulting from cheating or from improper help by the instructor will be a false indication of a student's learning.

b. Procedures for Administering Test (fig. 84).

(1) *Have all testing materials ready.* Make sure that test blanks, directions, checklists, operation sheets, tools, tools, pencils, scratch paper, or other materials required will be on hand in the classroom or test area before the test is scheduled to start.

(2) *Train your assistants.* Direct them to handle mechanical aspects of the test, such as passing out materials, while you control the overall situation. The number of assistants required will depend upon the time required for administering the test and the number of individuals being tested.

(*a*) The smoothness of the testing procedure will be affected by the efficiency of the assistants. Prepare a workable schedule for assistants to follow in distributing and collecting test materials, seating and dismissing the students, checking student work, supervising the conduct of the test, and giving students any help that is proper.

(*b*) Go over the examination carefully with the assistants and indicate to them the points at which they may expect students to have difficulty, the amount and kind of help they may give students, and their exact function and location in the classroom.

(3) *Provide the best possible testing conditions.* Students cannot do their best in a dark, noisy, or crowded classroom. Eliminate all interest-destroying factors (unless such conditions are part of the test situation, as in the case of a test given to determine proficiency under battle conditions and administered with a noisy and distracting background). Place seats (or working layouts) so that each man will have ample working space and will not be in a position to inadvertently see anyone else's work. Men should be mentally and physically rested before they are given any crucial examination; no one in a state of fatigue, such as might be brought on by a long march or a sleepless night, can do justice to an examination (unless the test is purposely given at such a time to test knowledge or reactions under adverse conditions).

(4) *Give students a good start.* A test, like any other phase of instruction, should be started in a businesslike manner. The instructor should put the men at ease and encourage them to do their best.

(*a*) Make certain that the test instructions and directions are understood. Read these instructions and directions to the men and encourage questions in order to clear up any possible misunderstandings.

(*b*) Before starting the test, tell the students the kind of help they can obtain and the materials that are to be used. Tell them whether there is a time limit; if there is, explain whether it applies to the overall test or only to separate items or sections. If there is to be a bonus for speed or accuracy, explain it.

(5) *Conduct the test carefully.* In order for a test to best reflect the ability of each man in the class, the conditions under which it is conducted should affect each man alike.

(*a*) Maintain order. Do not allow any student to interrupt another student or create any disturbance.

(*b*) If the test is timed, be sure that it is timed accurately. Tell the men in advance what time they must cease work.

76. Conducting the Critique of Tests and Practical Exercises

a. General. An examination or practical exercise that cannot be interrupted for immediate on-the-spot correction of errors should always be followed by a critique to inform the student what was done right and what was done wrong. Good instruction includes intelligent, tactful, and constructive criticism; this criticism can be given most effectively in a group discussion held after an exercise or problem. The critique can be used to—

(1) Sum up and clarify a situation developed in the lesson and point out correct or incorrect methods of execution.

(2) Provide an overall view of the entire applicatory operation or maneuver.

(3) Indicate the strong and the weak points of a performance and methods or procedures to be used in correcting errors or mistakes.

(4) Reemphasize the fundamental points of the lesson.

(5) Develop among personnel a spirit of unity and an appreciation of the cooperation and teamwork necessary in military activities.

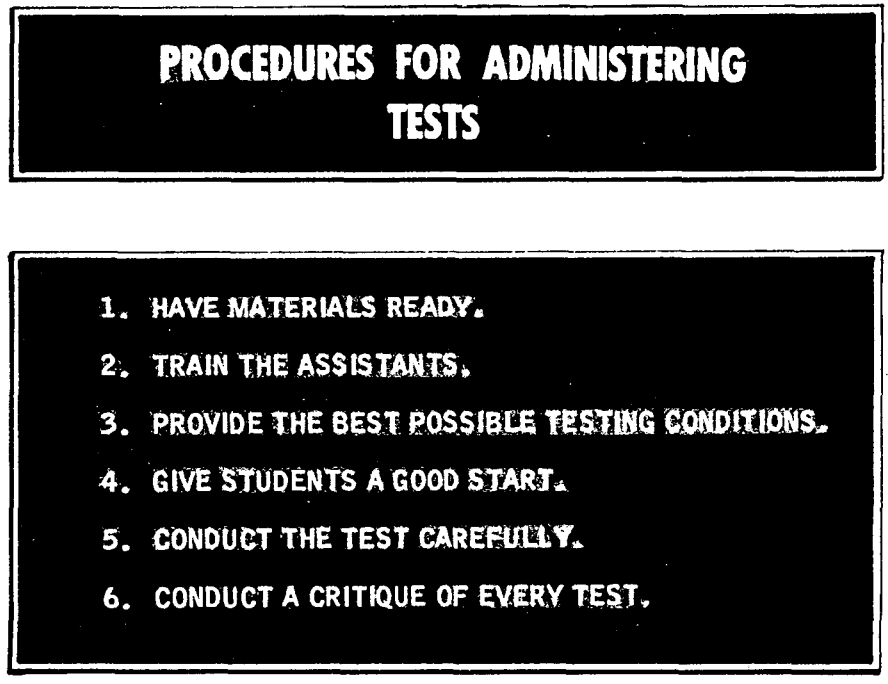


Figure 84. Procedures for administering tests.

b. General Considerations.

(1) *Human relations are important.* In conducting a critique, the instructor must not be sarcastic; he must make criticisms or comments in a straightforward, impersonal manner. Students should leave the critique with a favorable attitude toward the training activity and with a desire to improve.

(2) *The critique should relate the instruction to the subject or course.* It should emphasize the continuous nature of training by calling attention to what has been done earlier and to the relation of the instruction just completed to the subject or course of which it is a part.

(3) *Specific points should be covered.* Procedures used, examples of personal initiative or ingenuity, type of errors and ways for correcting them, and fundamental teaching points should be covered specifically.

(4) *Fundamentals should be emphasized.* The critique that follows an applicatory exercise—particularly a tactical problem—should indicate the various acceptable solutions; it must not give the impression that there is but one correct method of solving the problem. Such a misconception leads to the adoption of stereotyped solutions and to attempts to guess the approved solution, resulting in loss of initiative and independent thought. The critique should emphasize the fundamental principles of tactics in a situation, and should criticize and evaluate the different student solutions on the basis of their completeness, effectiveness, and observance of these fundamental principles.

(5) *Student participation should be encouraged.* In almost every class there will be individuals who can relate experiences that will emphasize and illustrate key points. Too, a well-controlled class discussion makes the students feel that the critique is a period for learning rather than a time set aside for criticism of their performance.

c. Steps in the Conduct of the Critique. The critique cannot be planned as thoroughly as other instruction, because the points to be covered are influenced directly by the performance of the students. Advance planning can include the time and place and the general outline. During the practical exercise the instructor can take notes to guide his critique, but detailed planning is not practical. However, the instructor can insure complete coverage of the essential elements (fig. 85) by following this general procedure:

(1) *Step 1.* Restate the objective. This will enable the class to start its consideration of the period of instruction on a common ground. This step is necessary because some students may have become concerned with only a particular aspect of the subject and may have forgotten the overall objective.

(2) *Step 2.* Review procedures employed. In this step, briefly summarize the methods used in the exercise, or the teaching points brought out, to attain the objective. After a practical exercise, description of the activities of various participants and how each contributed to the common goal will answer the student questions: "What was this all about?" "What did we do?" "What part did I play in the big picture?"

(3) *Step 3.* Evaluate performance. This is the most important part of the critique of a practical exercise. Using notes taken during the exercise, the instructor points out and discusses the strongpoints of the exercise. Then he brings out the weaker points and makes specific suggestions for improvement. He must be careful not to "talk down" to the group and must not expect a standard of performance beyond the capabilities of the students, considering their state of training. All remarks must be specific; students will not profit from generalities.

(4) *Step 4.* Conduct group discussion. The instructor should encourage the class to discuss the points mentioned and to suggest other points for discussion. All the techniques of conducting a directed discussion apply in this step to insure that criticism is constructive and that discussion is to the point.

(5) *Step 5.* Summarize. The critique should be concluded with a brief but comprehensive summation of the points brought out. The instructor can reemphasize objectives and suggest study and practice to overcome deficiencies. The critique should be business-like.

77. Interpreting Test Results

a. General Considerations. Do not assign too much importance to a single test grade, no matter how well-constructed and administered the test may have been. The reason for this caution is that all test responses, observations, and scores are subject to various small factors that are called random errors. Because of these random errors, a student who makes a certain score on one test may make a considerably different score on a comparable test given under slightly different conditions, at a different time, or under the supervision of a different instructor. The lower score may have been caused by conditions occurring—

(1) In the test, such as ambiguities, poor selection of items, poor printing, or distractions in the test environment.
(2) In the student, such as poor physical condition, emotional upsets, or reading too fast.
(3) In the instructional situation, such as variation in scoring standards or absences for unavoidable causes.

b. Steps in Interpreting Test Results.

(1) *Analyze student responses to the separate items.* This analysis is made in order that—
  (*a*) Weaknesses or gaps in student mastery of instructional material can be determined and remedied by further instruction.
  (*b*) Instructional inefficiency can be detected.
  (*c*) Student learning can be expedited by a detailed discussion of the examination.

(2) *Interpret total test scores.* The overall results of a test will—
  (*a*) Separate qualified students from those not qualified to perform the task or job.
  (*b*) Indicate the relative degree of learning each student has attained.

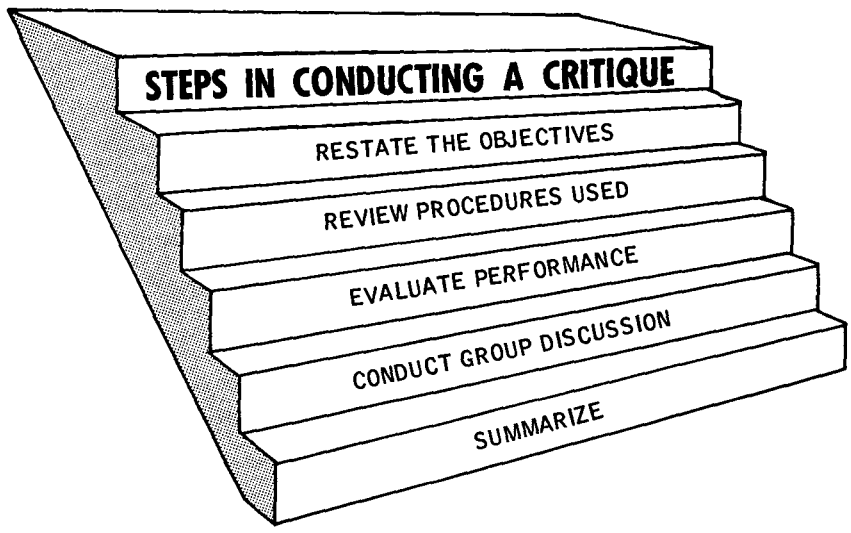


Figure 85. Steps of the critique.

(3) *Assign grades.* Grades indicate the instructor's final evaluation of students' performance in a subject or course. While grades may be assigned to scores from a single test or observation, most grades will be based on the combined results of several tests and a number of observations.

c. *Evaluating Responses to Test Items.*

(1) *Procedure.*

(*a*) Prepare a summary of the errors made on each item. If you have a card file of test items, record the number of errors for each item on its card.

(*b*) Group the items missed in terms of—

1. *Teaching objectives.* If nearly all items relating to one or more teaching objectives were missed, it usually indicates inadequate instruction.

2. *Similar types of items.* If a large number of errors are made on an oral test covering the same material, either the students have not learned to do the job or the test was set up improperly, perhaps with faulty directions or ambiguous items. Directions and items should be carefully studied and revised, if necessary, before the test is used again.

(*c*) Analyze the type of error made. Clues to student misunderstanding or to weakness of instruction can often be found in student responses or behavior. For example, the way students respond may indicate that the terms used were misunderstood, or that directions for performing an operation were not clear. An analysis of this type will be of value in discussing the examination with the students as well as in improving future instruction.

(*d*) Analyze the errors made by individual students. The responses of all students should be studied, but the responses of lowscoring students will require more careful attention than will those of the more capable. A few errors may be due to a student's absence from one or more class meetings, while other errors are traceable to slowness in mastering the subject matter. The instructor should attempt to locate the source of a student's errors and initiate the necessary corrective measures, such as special classes, individual help, or reviews.

(2) *Cautions.*

(*a*) Despite his best efforts, the instructor's terminology and phraseology will sometimes be misunderstood, or will be interpreted in different ways. This will result in test errors that are not necessarily evidence of faulty instruction or incorrect learning.

(*b*) A student's physical or emotional condition will influence his behavior in a test situation. A student who is sick or worried will frequently make errors on subject matter that he has mastered.

d. Interpretation of Total Test Scores. Scores made on a test must be interpreted in relation to the achievement of other students in the same test situation and on established performance standards. The instructor first determines the critical score, or passing mark, and then converts the scores to common numerical values.

(1) *Frequency distribution tables.* The first step in interpretation of test scores and assignment of grades is the construction of a frequency distribution table. In figure 86 the steps involved in the tabulation of scores are given below the table. This table gives the instructor an overall picture of performance on the test. Test scores tallied here are called raw scores—scores based entirely on the number of test items answered correctly. Raw scores have little meaning in themselves; they must be put in tabular form and the table must be interpreted.

(2) *Setting the critical score.*

(*a*) From the frequency distribution

FREQUENCY DISTRIBUTION TABLE

Grouped Scores	Tally of scores in each group	Number of scores in each group
75—79	I	1
70—74	II	2
65—69	II	2
60—64	𝍸 II	7
55—59	𝍸	5
50—54	𝍸 IIII	9
45—49	𝍸 II	7
40—44	𝍸	5
35—39	IIII I	6
30—34	I	1
25—29	III	3
20—24	II	2

Steps involved in setting up a frequency distribution table:

1. Determine the range of scores. Find the difference between the highest and lowest scores made on the test. This difference plus one is called the RANGE of the distribution. In the case of the scores above, the range was (75 — 22) + 1 = 54.

2. Determine the size of the INTERVAL. Use the range to determine whether the scores should be grouped by units of 1, 3, 5, 7, etc. No special rule relative to the number of intervals to be used can be stated, but it is usually desirable to group scores into approximately 12 to 25 intervals. In the example above, the interval of 5 seemed most desirable.

3. Tally the test scores and complete table.

Figure 86. Frequency distribution table.

table, the instructor can set the critical score by inspection based upon judgment and unit policy. This policy may be influenced by the normal distribution curve, but it should not be too rigidly established or blindly administered. In handling achievement test scores, there is no substitute for the best judgment of competent instructors and administrators.

(*b*) A common error in establishing the critical score on a test, and in giving grades, is to assume that correctly answering 70 percent of the items should always give a passing grade. The percentage score actually means very little, because tests often vary in difficulty. However, percentage scores may have value in testing situations where standards have been carefully set or in cases where scores have been adjusted for difficulty.

(*c*) In setting a critical score, the instructor will frequently consider other factors than the test scores.

1. *Instructor's opinion.* If the instructor considers that student performance is satisfactory, a passing grade should be given. His judgment should be the principal factor in setting the passing mark.
2. *Student past performance.* Past performance records of students should be considered in arriving at a critical score for a given test.
3. *Average scores of several classes.* In evaluating the performance of one class against the records of previous classes, be sure to take into account any known differences in the instructional situation.
4. *Use of the normal distribution curve.* This procedure is explained in *e* above.

(3) *Converting the scores to common numerical values.* This is essential if the test results are to be used in estimating the relative achievement of each man, in comparing his achievement on one test with his achievement on another, in making a fair evaluation of his ability, or in computing a final grade for a phase of subject matter. The scores may be converted into common numerical values in several ways.

(*a*) Adjectival ratings or letter grades may be assigned on the basis of established standards. Thus, if a student's performance reaches the highest established standard, he is given a "superior" or an "A." The distribution of these grades may or may not follow the normal distribution curve.

(*b*) Percentage scores may be used. These scores have little meaning unless tests are uniformly difficult. For example, 90 percent might be a high score on one test, a low score on another.

(*c*) Test scores can be converted into numerical grades by using a translation graph. This method can be used by persons who are not experienced in the computations necessary to employ statistical techniques in establishing scores. For example, an 80-point examination produced the test scores shown in figure 86. In order to translate these scores into class grades, the instructor used the graph shown in figure 87. The practice in the training unit was to use 70 as a passing grade. By inspection of the frequency distribution table and by comparison with accepted standards of performance, the instructor set 33 as the passing score. He then plotted the point 70–33 on the graph and drew his conversion line from that point to the highest possible score, which he considered a grade of 100, and to the minimum score, which he considered a grade of 0. Test scores were then converted to class grades, which had meaning to the students.

(*d*) Rank order is often used to indicate performance in a course.

(*e*) Percentiles and standard scores are the most useful numerical values, but their computation should not be undertaken unless qualified personnel are available to compute and interpret the values.

(4) *Evaluation of personal characteristics.* Because personal characteristics cannot be measured as precisely as skills and knowledge, their interpretation is more complex and subjective. But, through the use of carefully prepared checklists, rating forms, and well-planned interviews and observations, personal characteristics can be evaluated with satisfactory accuracy. Except for the fact that results must be interpreted with more caution, the procedures used in converting scores to common numerical values are the same as described in (3)(*c*) above.

(5) *Cautions to be observed.*

(*a*) A test score in itself is meaningless.

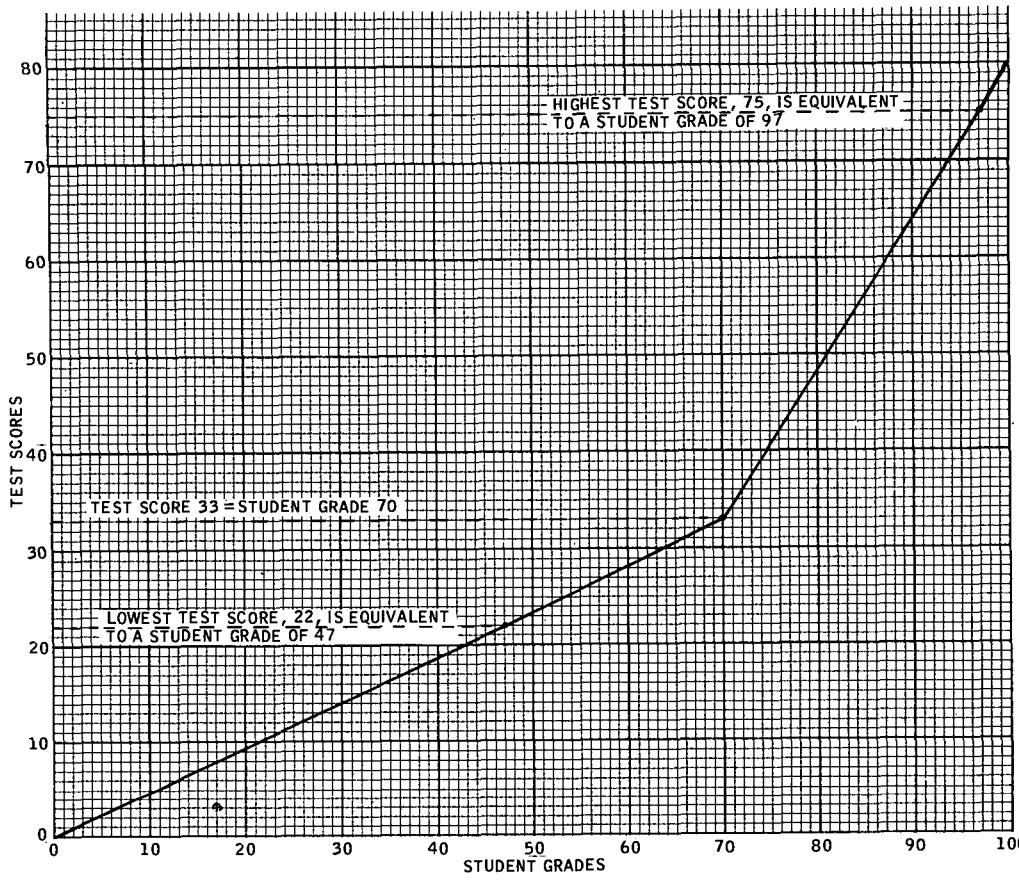


Figure 87. Translation graph.

A zero scores does not mean that a student knows nothing about the subject, nor does a perfect score mean that the student knows everything. A zero means that the test was far too difficult to measure what the student had learned, while the perfect score may mean that the test was too easy. Likewise, two scores, one of 40 and another of 80, cannot be interpreted by themselves as meaning that one student has achieved twice as much as another.

(*b*) Scores for different tests are not directly comparable unless the tests serve the same purpose, have the same number of items, are equally difficult, and are equally valid and reliable. Since these conditions rarely hold, it is unsafe to compare raw scores from different tests.

e. Use of the Normal Distribution Curve To Establish Grades (figs. 88, 89.).

(1) The statistical measure used in computing grades by means of the distribution of scores is the standard deviation. Most comparative grading systems are based on this statistical measure (see fig. 89). The standard deviation is a measure of variability that indicates how closely the scores tend to cluster about the average score for the class; in effect, it is a measure of distance. In a normal distribution, if one standard deviation is measured from the mean, either above or below, approximately 34 percent of the scores will be included in the distance measured. The length of a standard deviation will vary from distribution to distribution, because it must be derived statistically from the spread of

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the scores. However, in every instance, the percentage of scores included will remain about the same. One and one-half standard deviations on either side of the mean will include approximately 43 percent of the scores; therefore, the total of one and one-half standard deviations on each side of the mean will include approximately 86 percent of all scores. Consequently, it is possible to establish constants that will be applicable to every testing situation.

(2) The application of these constants to specific situations is an arbitrary matter. It is based on the assumption that, in a normal distribution of scores, those that are below one and one-half standard deviations from the mean represent results that are below normal and those above one and one-half standard deviations from the mean are above normal. In other words, 86 percent of all people are about normal, 7 percent are below normal, and 7 percent are superior.

(3) The simplest method of applying this principle, and one that can be put into effect without any statistical computations whatever, is to classify all scores into three groups: unsatisfactory, satisfactory, and superior. The unsatisfactory group will include all students whose scores are more than one and one-half standard deviations below the mean. Since the scores below this point will always equal about 7 percent of the group, all the instructor must do is arrange the scores in descending order, determine the number of students in the unsatisfactory group by taking 7 percent of the

Test score X	Frequency f	fX	Deviation From Mean d	d^2	fd^2	$\frac{d}{s}$
47	2	94	8.1	65.6	131.2	1.76
46	7	322	7.1	50.4	352.8	1.54
45	8	360	6.1	37.2	297.6	1.32
44	8	352	5.1	26.0	208.0	1.10
43	12	516	4.1	16.8	201.6	.89
42	11	462	3.1	9.6	105.6	.67
41	15	615	2.1	4.4	66.0	.45
40	12	480	1.1	1.2	14.4	.23
39	8	312	.1	.0	.0	.02
38	12	456	−.9	.8	9.6	−.19
37	12	444	−1.9	3.6	43.2	−.41
36	10	360	−2.9	8.4	84.0	−.63
35	7	245	−3.9	15.2	106.4	−.85
34	1	34	−4.9	24.0	24.0	−1.07
33	7	231	−5.9	34.8	243.6	−1.28
32	6	192	−6.9	47.6	285.6	−1.50
31	4	124	−7.9	62.4	249.6	−1.72
30	2	60	−8.9	79.2	158.4	−1.93
29	4	116	−9.9	98.0	392.0	−2.15
28	1	28	−10.9	118.8	118.8	−2.37
27	1	27	−11.9	141.6	141.6	−2.59
	150 (N)	5,830 (ΣfX)			3234.0 (Σfd^2)	

$$\text{Mean} = \frac{\Sigma fX}{N} = \frac{5{,}830}{150} = 38.9$$

$$\text{Standard deviation} = \sqrt{\frac{\Sigma fd^2}{N}} = \sqrt{\frac{3234.0}{150}}$$

$$= \sqrt{21.6} = 4.6$$

Figure 88. Computation of mean and standard deviation.

total number of students, and mark the papers accordingly. The satisfactory group will then include all those whose scores fall within one and one-half standard deviations above and below the mean. This includes about 86 percent of the class. If a distribution of scores into a five-grade classification is desired, the instructor might proceed as follows: the lowest 7 percent will be marked F; the next 24 percent will receive a grade of D; the next 38 percent will be C; the next 24 percent will be marked B; and the top 7 percent will receive an A.

(4) It must be reemphasized that the above method will prove satisfactory only when there is a normal distribution. In most instances it will be necessary to make modifications; otherwise, the lower students may suffer. This is especially true in advanced classes, where the better background of certain students may put them far ahead of the class average. Such a group is not normal.

(5) Computation of standard deviation is illustrated in figure 88. A more detailed explanation of how to compute standard deviation and the other grading systems referred to in figure 89 can be found in any standard text book on educational statistics.

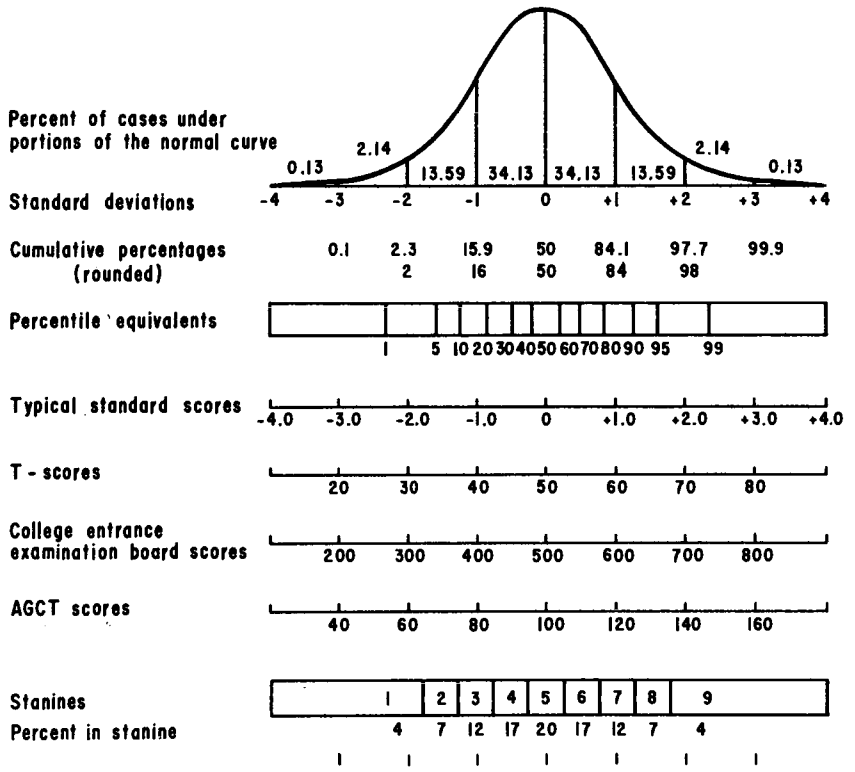

Figure 89. A comparison of grading systems.

CHAPTER 13

INSTRUCTOR TRAINING

78. General

Many organizations include in their programs of instruction not only military subjects but also training in instructional methods and techniques. To assist personnel charged with the responsibility of setting up an effective instructor training course, this chapter presents: first, several basic considerations that should govern the organization and administration of a course in instructional methods; second, training schedules for two different types of instructional methods courses, and third, suggestions for improving instruction through on-the-job training. Suggested lesson outlines for use in such training are given in appendix B.

79. Basic Considerations in Setting Up the Course

a. Make the Course Fit the Need. The course must satisfy the requirements of the local situation; the instruction presented must be adapted to the needs of the personnel assigned to take the course. Although basic principles remain the same in all instructional methods, the emphasis on specific techniques will vary, depending on what subjects will be taught by the instructor to be trained.

b. Plan Practical Work First. The effectiveness of an instructor training course will depend upon the practical experience it provides. Therefore, the students must be given an opportunity to gain experience in planning, presenting, and evaluating instruction. The entire course should emphasize practical work, especially if most of the students are inexperienced as instructors. This practical work should closely parallel the type of teaching the students will later do in their units.

c. Select Subject Matter That Will Help the Students in Their Practice Teaching. For example, the first period of practical work may be a short talk in which students use the lecture method. The conference prior to this talk should cover only subject matter that will assist them in performing this exercise. The instruction thus becomes more meaningful to the student because he realizes that he will apply the principles in his lesson. Make the practical work serve as the means for emphasizing the importance of the subject matter.

d. Present the Subject From the Standpoint of How Students Will Use It. Instruction should be specific and designed for the students and their particular needs. Instructors must use numerous examples and illustrations in their presentations to make material meaningful to students, and must take every opportunity to present the subject from the standpoint of the student's use of the material on his job.

e. Make Wide Use of Demonstration Lessons. The best way to set high standards of instruction is to show the students, through demonstration lessons, what is expected of them. If students are to learn how to present an effective lesson in map reading, show them a demonstration lesson in that subject. It is easier for them to imitate demonstrated techniques than to apply ideas presented by oral methods.

80. A Suggested Instructor Training Course

a. General. Several factors—such as time available, number of students and instructors, available facilities and equipment—will affect the setup of the course. The course described in this paragraph is designed to handle 48 students; these students would be together for the conference work and divided into 3 sections for their student lessons. If more than 48 students attend the course, additional instruc-

tors must be provided (to handle the practical work) on the basis of 1 instructor to each added group of 16 students, or fraction thereof.

b. Recommended Training Schedule. The following schedule is offered as a guide; it should be altered to fit the training situation.

Total Hours—78

Subject	Hours & Type	Scope	References
Welcome—The Army Instructor	2–L, C, PE	To provide a general knowledge of the purpose and conduct of the course and facilities available. Explanation of schedule of instruction, with emphasis on practical work required of students. Completion of administrative details, and issue of course materials. Discussion of the instructor's role in training, his qualifications, how he can improve, and how he should think of and deal with students. Each student will present an autobiographical sketch.	FM 21–6, para 3–7.
Principles of Instruction	1–C, E	To provide a general knowledge of the teaching-learning process, including the nature of learning, the instructional process, and the principles of instruction.	FM 21–6, para 8–11.
Presenting Oral Instruction	2–C, PE	To provide a general knowledge of the elements of oral instruction that are common to the presentation of instruction. Explanation will include how to present lesson objectives; how to handle problems of organization, transition, interest, and emphasis; and how to summarize.	FM 21–6, para 12–16.
Speech Techniques	1–C	To provide a general knowledge of effective speech techniques. How to maintain contact and good bearing; how to use notes; importance of avoiding distracting mannerisms; how to control nervousness and develop enthusiasm; and the importance of developing vocal variety, force, and distinctness.	FM 21–6, para 17–25.
Preparation for Student Lessons	2–PE	To provide a working knowledge of how to prepare an introduction. Students will make individual preparation under guidance of instructors. Preparation should include rehearsals.	FM 21–6, all previous references.
Introductions	3–PE	To provide a working knowledge of how to present effective introductions. Each student will plan and present a 3–5 minute introduction included in the instructional or training program of the unit to which he is assigned. The techniques previously presented will be critiqued. The class will be divided into sections.	FM 21–6, all previous references.
Training Aids	2–C, D	To provide a general knowledge of the types of training aids used in the Army, and the local procurement and techniques of using them. Explanation and demonstrations will include how to use the chalkboard, the overhead projector, charts, and actual items of equipment. Materials and equipment provided locally for making aids will also be explained and demonstrated.	FM 21–6, para 33–38.
Demonstration Method	1–C, D	To provide a general knowledge of the types of demonstrations and their use in military instruction. Explanation will include factors to consider in planning a demonstration and techniques for the conduct of demonstrations.	FM 21–6, para 39–42.

Subject	Hours & Type	Scope	References
Questioning Techniques	1–C, PE	To provide a general knowledge of the use of questions in instruction, including characteristics of a good question, techniques of asking questions, and the handling of student answers.	FM 21–6, para 26–32.
Preparation for Student Lessons	3–PE	To provide a working knowledge of how to prepare an explanation, using the chalkboard. Students will make individual preparation under guidance of instructors. Preparation should include rehearsal.	FM 21–6, all prior references.
Chalkboard Presentations	6–PE	To provide a working knowledge of the use of the chalkboard during oral presentation. Each student will plan and present a 10-minute lesson. Each student lesson will be critiqued. The class will be divided into sections.	FM 21–6, all prior references.
Application	2–C, D	To provide a general knowledge of the methods and techniques employed in conducting applicatory training. Explanation will emphasize the progressive nature of applicatory methods. A demonstration lesson employing the group performance method will be presented.	FM 21–6, para 43–49.
Evaluation	2–C	To provide a general knowledge of the role of evaluation in the instructional process, including forms of tests, with emphasis on the performance test, observation techniques, and procedures for administering tests.	FM 21–6, para 67–76.
Planning the Lesson	4–C, PE	To provide a working knowledge of how to prepare a unit of instruction for teaching. Explanation will include use and study of approved lesson materials, how to develop instructor notes, requirements for and techniques of rehearsing, and how to write a simple lesson plan. Practical work will consist of students writing their lesson plans for short lesson presentations.	FM 21–6, para 60–66.
Preparation for Student Lessons	8–PE	To provide a working knowledge of how to plan an oral unit of instruction in which the conference method of instruction and student-made training aids are used. Students will make individual preparation under guidance of the instructors. Preparation should include writing a lesson plan, making aids, and rehearsing.	FM 21–6, all prior references.
Short Lesson Presentation	8–PE	To provide a working knowledge of the methods and techniques for presenting a conference unit of instruction. Each student will plan and present a 15-minute lesson applicable to the training program of the unit to which assigned, in which he will apply techniques so far presented in the course. A lesson plan will be submitted for grading. Presentations will be supported by student-made training aids. Presentations will be critiqued by members of the class and the instructor. The class will be divided into sections.	FM 21–6, all prior references.
Preparation for Student Lessons	12–PE	To provide a working knowledge of how to prepare a unit of instruction in which the complete instructional process of presentation-application-evaluation is used. Students will make individual preparation under guidance of the instructors. Preparation will include writing a lesson plan and rehearsing.	FM 21–6, all prior references.

Subject	Hours & Type	Scope	References
Long Lesson Presentation	16–PE	To qualify each student to prepare and present a complete unit of instruction. Students will be required to teach unit of instruction from their training schedule, in the classroom or area normally scheduled for such training, when possible. Presentations will be 35 minutes long. A lesson plan will be presented for grading. Each presentation will be critiqued by students and the instructor. The class will be divided into sections.	FM 21–6, all prior references.
Final Examination and Critique	2–E, CR	Each student will take a 50-minute written examination that will test his understanding of the material taught in the course. A critique of the examination will be conducted during the second hour.	FM 21–6, all prior references.

L—Lecture
C—Conference
D—Demonstration
PE—Practical Exercise
E—Examination
CR—Critique

81. Refresher Training in Methods of Instruction

a. General. It sometimes becomes necessary to present orientation or refresher training in the shortest time possible. The course outlined in this paragraph consists of 4 hours of conference, primarily on techniques of instruction; student lessons are rehearsals of scheduled instruction. The chief value of this course is to motivate the cadre and to let them know the commander's desires with regard to instructional standards.

b. Refresher Course in Methods of Instruction.

Total hours—4 plus

Subject	Hours & Type	Scope	References
The Instructional Estimate	1–C, PE	To provide a general knowledge of the instructional duties of the instructor in a troop unit or training command. The student will be led through an instructional estimate that will require him to use training programs and schedules to determine what to teach and to consider status of training and facilities to determine the general plan of instruction. The student will be required to make specific application of these considerations to the basic subjects that he will rehearse for actual presentation.	FM 21–6, para 60–62*a*
Organizing the Lesson	1–C, PE	To provide a general knowledge of subject analysis to determine specific learning objectives and methods of instruction. Explanation will include application of the "three stages of instruction," concept, and principles of instruction. Students will be led through an analysis of subjects similar to those on their unit's training schedule.	FM 21–6, para 8–11, 62*b*–63.

Subject	Hours & Type	Scope	References
Selecting Aids and Writing the Lesson Plan.	1–C, PE __	To provide a general knowledge of how to write a lesson plan, including selection of appropriate training aids. A practical exercise on the lesson plan will be used.	FM 21–6, para 33–38, 64–65.
Instructional Techniques ___	1–C _____	To provide a general knowledge of instructional techniques, including how to speak effectively, how to ask questions and handle student responses, how to use training aids, and how to supervise practical work.	FM 21–6, para 17–32, 36, 39–41, 48.
Rehearsals of Scheduled Units of Instruction.	Time as required — PE.	To provide a working knowledge of how to plan and conduct effective instruction. Each student will plan and rehearse a period of instruction from his unit's training schedule. Each rehearsal will be monitored and critiqued.	FM 21–6, all prior references.

82. The Conduct of Practice Teaching

The value of training in instructional methods lies primarily in the students' practice teaching and the skill of instructors in administering and supervising this phase of the course. The following procedures are recommended:

a. Lesson Schedule. Publish a student lesson schedule as far in advance of the first student lesson period as possible. List date, time, student's name, subject, and place.

b. Preparation Time. Make every effort to give each student adequate time for preparation. At this point give assistance freely.

c. Facilities and Equipment. Make available to students, whenever possible, all the facilities and equipment they would be expected to use in an actual training situation with troops.

d. Student Critique. At the beginning of student lessons, explain the procedure to be followed. Appoint a student critic for each lesson; have him conduct a critique of the presentation, using the procedure outlined in this manual. Require all students, including the student critic, to write comments on each presentation; at the end of the lesson collect these written comments and pass them on to the student instructor. As a guide to the critic, and to the other students in writing their comments, a student's critique sheet should be furnished (app C). Techniques of conducting critiques are presented in paragraph 76.

e. Instructor Critique. Following the student's critique, the instructor should present his critique. This is his opportunity to give helpful constructive criticism and also to point out wherein instructional principles and techniques were applied. In observing students, instructors should use a supervisory checksheet (fig. 83).

83. Improving Instruction Through On-the-Job Training

The commander cannot depend solely on an initial course in methods of instruction to provide high instructional standards. Such a course can lay the groundwork, but if standards are to be maintained and raised, the commander must exercise expert supervision and follow through with a sound program of on-the-job training of his instructors. This training will involve—

a. Conducting Group Conferences. Group conferences should cover new procedures and techniques, coordination of instruction, and suggestions to instructors. These meetings can be informal, and instructors should participate actively.

b. Working With Individual Instructors. All instructors benefit from supervision followed by individual conferences and guidance. Some will need more help than others.

(1) *All instructors.* Supervisors should confer with instructors as soon as possible after observing their teach-

ing, calling attention to strong and weak points of their lessons and offering definite suggestions for improvement. In this conference, the supervisor must be impersonal and straightforward. He must be specific and must be certain his criticisms are understood. He should allow the instructor to answer criticisms.

(2) *New and inexperienced instructors.* Supervisors should hold conferences with these men to assign them to their teaching duties, to inform them of any special conditions, and to estimate their abilities and aptitudes. The supervisor should check a new instructor's lesson plan as soon as it is written, and should be present at the rehearsal of the lesson to detect mistakes and to suggest means of improvement. He should then observe the class and confer with the instructor as in (1) above.

(3) *Weak instructors.* The technique of improving new instructors also applies to improving weak instructors. Patience and understanding are necessary, but if an instructor shows no improvement after several lessons, he should be assigned to duties more suited to his abilities.

c. Conducting Short Refresher Courses. Short refresher courses covering both subject matter and instructional methods are of value to the on-the-job instructor training program.

d. Requiring Observation of Classes. Another effective method of improving instruction is that of requiring instructors to visit and observe critically the work of other instructors. This helps them learn additional procedures and techniques.

84. Techniques of Supervising Instruction

a. The supervisor should follow certain definite steps in observing classes just as an instructor employs certain techniques in presenting a lesson.

(1) *Plan the observation.* A supervisor should prepare for visits of classes. He must know what factors to look for and to appraise, which are important and which are irrelevant. Just going to the classroom and looking will not give the observer a comprehensive grasp of what is going on. He should have available for immediate reference the schedule of classes and copies of the lesson plan. Before visiting the class the observer should familiarize himself with the content of the lesson plan so that he will waste no time in evaluating the instructor's performance.

(2) *Use a rating form.* The most acceptable procedure in observation is to use a short rating form which consists of a list of points to be observed in the class and space for ratings and comments, see figure 83.

(3) *Submit reports of observation.* The supervisor should realize that the results of his observation are a check on his own performance as well as that of the instructor. The supervisor's rating form and supervisory notes should show that he is aware of all important problems, obstacles, and procedures. The reports of the observation should be forwarded to the commanding officer. These reports will increase the effectiveness and quality of both instruction and supervision.

b. Procedures for observing classes—Certain courtesies must be observed by the supervisor in visiting a class. The fact that he is there to observe the class and not to draw attention to himself should dictate his actions.

(1) *Keep scheduled visits unannounced.* The supervisor should inspect a class when he is least expected if he is to observe the instruction as it is routinely done. There should be no regular schedule, and no instructor should be informed that he will be visited at any particular time.

(2) *Enter class inconspicuously.* If the class is meeting indoors, the supervisor will enter quietly at the rear of the room whenever possible and de-

mand no recognition from the students or the instructor. The instructor should not call the class to attention nor break his presentation. In the field, the observer approaches the class from the direction least likely to distract student attention. The supervisor should do everything he can to keep the instructional situation exactly as it was when he arrived.

(3) *Get the feel of the whole situation before analyzing details.* In the words of the proverb, the supervisor should "See the forest before looking at the trees." Estimate the general effect that the class gives. Analyze whether or not the class seems to be moving in an orderly fashion or if there is a lack of coordination. Determine the clarity of presentation.

(4) *Study specific aspects of the class.* After getting the feel of the classroom situation, the supervisor should analyze it for details. In observing a class, avoid attaching too much importance to any one detail. There is a tendency for some supervisors to insist on elaborate, detailed procedures which have little or no relation to effective teaching. In supervising, the observer should notice all points listed on the rating form.

(5) *Appraise the total situation.* At the end of the observation the supervisor should evaluate the instruction carefully, noting the major merits and weaknesses and appraising each in terms of the entire class procedure. Student reaction is an important clue to the effectiveness of the lesson. Class interest and participation will furnish evidence of the degree to which the instructor has sold his subject to the students.

(6) *In general, refrain from taking part in class activities.* Whatever remarks the supervisor wishes to make, he will save them until the end of the class period, make them at some point in the discussion which will not embarrass the instructor, or take them up in a private conference with the instructor after class. If the instructors are trained and qualified to teach the subject, any mistake in procedure or in the explanation will be minor and can be corrected during the next class after the supervisor has informed the instructor of the error. If the instructors are new and not so capable, the supervisor may find it necessary to add a comment or to modify an explanation to prevent the students from learning a wrong procedure or an incorrect idea. Tact and courtesy must be observed by the supervisor whenever he intervenes.

(7) *Never reprimand an instructor during his class.* Under no circumstances should the supervisor take over the class in the middle of a discussion, tell the instructor he was wrong, present a few points, and then turn the class back to the instructor. Any of these procedures has a disastrous effect on the morale and assurance of an instructor and causes the students to lose confidence in him. If the work of the instructor is unsatisfactory, he should be given another assignment.

(8) *Keep a record of all observation.* Because of the shortness of the observation period and the number of classes that must be checked, the supervisor should note, in his brief daily visits, only the more obvious matters that demand special attention. In the case of the supervision of an entire class period, the officer in charge should keep a more complete record of his observation. The record will enable the officer in charge to remember the important points to be discussed with the instructor during a conference which should be held as soon as possible after the observation. Previous records can be compared with present records of observation to check on the improvement made by the instructor on those points that were weak.

CHAPTER 14

MILITARY BRIEFINGS

85. General

The military briefing is used so extensively that it has become an accepted procedure from the highest to the lowest levels of command. Military briefings conserve the senior officer's time by eliminating his need to read through volumes of paper to obtain information. This chapter will explain the primary purposes of briefings, outline steps in planning and organizing, and discuss presentation techniques.

86. Purposes

a. General. The military briefing is a specialized type of oral presentation. It can serve to impart information or to obtain a decision.

b. Information. A briefing designed for this purpose presents new material to the audience. It does not solicit an approval of recommended action.

c. Decision. This briefing is designed to provide the facts, conclusions, and recommendations on which the commander can base his decision.

87. Planning the Briefing

The preparation for a briefing is essentially the same as for planning a lesson; however, differences in content and organization will be emphasized.

a. Analyze the Situation. This estimate begins with the assignment, and accompanying guidance, to plan and present a briefing. There are five items that must be considered.

(1) First, determine the purpose of the briefing. Guidance from the superior will usually determine the scope. If this is not specified, seek clarification. Remember, the purpose of any briefing is to inform accurately. Do not approach the preparation with the idea of selling, convincing, or entertaining.

(2) Second, consider the audience. The size and composition, including names and grades, of the audience are important in initial planning. The briefer should attempt to ascertain individual and collective interests, desires, and personal traits of the senior member.

(3) The third point in this analysis is the consideration of time and schedule contingencies. The briefer must determine, as early as practicable, the desired length of the presentation and the flexibility of the schedule or itinerary.

(4) Fourth, consider the requirement for facilities and equipment. If the briefing site is assigned, consider its utility in view of size, comfort, accessibility, acoustics, and freedom from distractions. Available facilities may affect selection of visual aids, seating arrangements, or use of assistants.

(5) Finally, check the SOP. Unit procedures may prescribe the commander's desires for conducting briefings, including nature and size of aids, protocol, uniforms, manner of greeting, use of manuscripts, and other important aspects.

(6) Explicit guidance and intelligent analysis of the briefing situation will lessen the possibility of error and wasted time as the briefer constructs his presentation.

b. Select and Organize Content. The content and organization depend on the purpose and scope established in the initial guidance. The briefer should study his subject thoroughly and

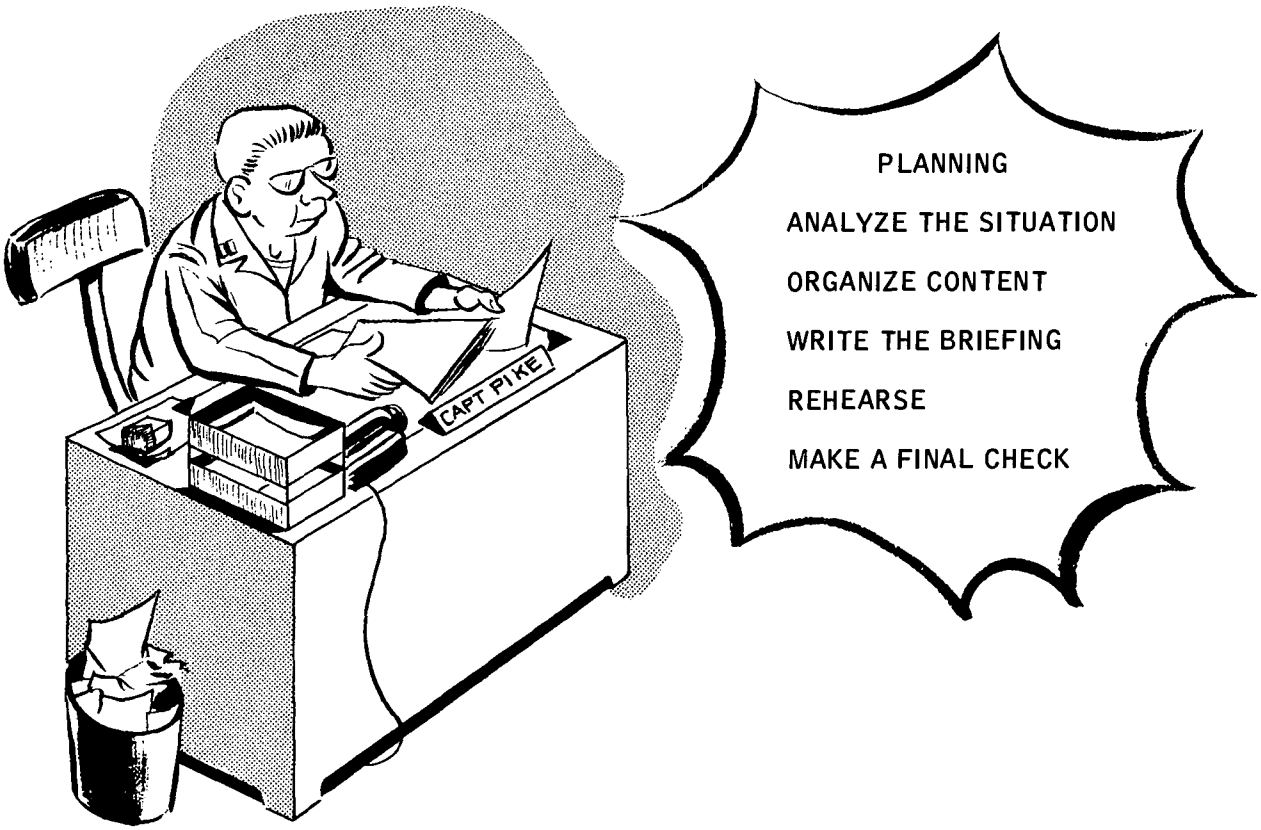

Figure 90. Preparation for a briefing.

acquire as complete an understanding as time and circumstances will permit.

(1) A briefing for a command decision is primarily an oral presentation of a completed staff study; therefore, the material has been selected and organized to a great extent. Nevertheless, the content of the briefing must be a careful and objective condensation of all the elements of the staff study.

(*a*) The introduction to a decision briefing should ordinarily consist of the following elements (see fig. 91).

1. *Greeting.* Following protocol, recognize by title and surname the senior members of the audience. Follow with "Gentlemen," in recognition of other present.
2. *Identification and classification.* Identify the briefing officer, classification of material, and security clearance of audience.
3. *Purpose.* This is stated in the same manner as the problem is phrased in the staff study. For example: "The purpose of this briefing is to obtain approval of a plan for relocating the Post Engineer facilities."
4. *Coordination.* A statement that coordination has been made with interested activities should be included.
5. *Procedure.* This element is not always necessary. Include it when the briefing consists of multiple presentations and phases.

(*b*) As previously recognized, the body of a decision briefing will follow the content and organization of the staff study.

1. *Assumptions.* If any were made, they should be stated.
2. *Facts bearing on the problem.* These

1. INTRODUCTION
   A. GREETING
   B. IDENTIFICATION AND CLASSIFICATION
   C. PURPOSE
   D. COORDINATION
   E. PROCEDURE
2. BODY
   A. ASSUMPTIONS
   B. FACTS BEARING ON PROBLEM
   C. DISCUSSION
   D. CONCLUSIONS
   E. RECOMMENDATIONS
3. CLOSE
   A. CONCLUDING STATEMENT
   B. DISCUSSION AS DESIRED

Figure 91. Organization of a decision briefing.

should be stated concisely and accurately.

3. *Discussion.* This should be a summary of the discussion paragraph or annex of the study. The initial statement should indicate the origin of the problem and point out any command guidance that was given. No other phase of the briefing reveals so critically the quality of the preparation.
4. *Conclusions.* Those reached as result of the study are stated.
5. *Recommendation.* This is usually read to insure accuracy and phrased so that the person in authority can indicate his decision by either yes or no.

(*c*) The close normally will consist of the statement: "Sir, this concludes the briefing. Do you have any (further) questions?" If several are participating in the presentation, each briefer will introduce the next, for example: "I will be followed by the S3, Major Jones." The briefing presentation will usually be followed by a discussion and comments from the individuals being briefed. Frequently, this discussion is led by the immediate superior of the briefing officer.

(2) The organization of an information briefing may vary widely, depending on the subject and audience. The general guidance for organization is to arrange the material so that the presentation will be in a logical sequence to give a clear and precise picture of the subject. The outline shown in figure 92 will usually apply.

(*a*) The introduction should begin with a greeting that recognizes all distinctive elements of the audience, for example: "General Black, Colonel White, Gentlemen." This greeting should be followed by a clear statement of the purpose and scope of the briefing, such as: "The purpose of this briefing is to inform you of the organization, mission, and current operations of the 2d Battalion, 33d Armor." If the briefing is to follow any usual sequence, the procedure would be stated.

(*b*) The body of an information briefing should follow the organization that enhances logical presentation, clarity, and conciseness. The main ideas are arranged and supported in a manner similar to any oral presentation of subject matter.

(*c*) The close may include a brief summary statement, a solicitation of questions, and a statement that the presentation is concluded. Do not use the "strong closing statement" concept. An example of a close is as follows:

"This presentation has covered the strength, personnel data, operational structure, and current projects in the G1 area of responsibility. . . . Do you have any questions?. . . . Sir, this completes (my portion of) the briefing."

c. Write the Briefing.

(1) Depending upon the local SOP, the briefer will prepare an outline or a complete manuscript. Submission of briefing content for advance approval is usually required. In any event, the briefer should seek firm approval of the content and organization prior to rehearsal.

(2) For actual use in the rehearsal and

1. INTRODUCTION
   A. GREETING
   B. PURPOSE
   C. PROCEDURE

2. BODY
   A. MAIN IDEA
   B. MAIN IDEA
   C. MAIN IDEA

3. CLOSE
   A. SOLICITATION OF QUESTIONS
   B. CONCLUDING STATEMENT

Figure 92. Organization of an information briefing.

presentation, the briefer may prepare a topical outline, prompter cards, note cards, or annotated manuscript. Procedural notes and use of visual aids should be included regardless of the form of writing. Local requirements and convenience of use should influence the form of writing.

(3) The briefer should coordinate with the alternate briefing officer, if one is designated, in his written preparation and also in the rehearsal.

d. Rehearse.

(1) Guidance from your superior or the unit SOP may require one or more rehearsals. Rehearsal for a briefing may, under certain circumstance, be of even more vital importance than rehearsal for a unit of instruction. The general guidance given in chapter 11 is pertinent.

(2) The clarity and organization of the material, effectiveness of visual aids, and manner of delivery should be principal points for constructive criticism.

e. Make a Final Check. The items shown in

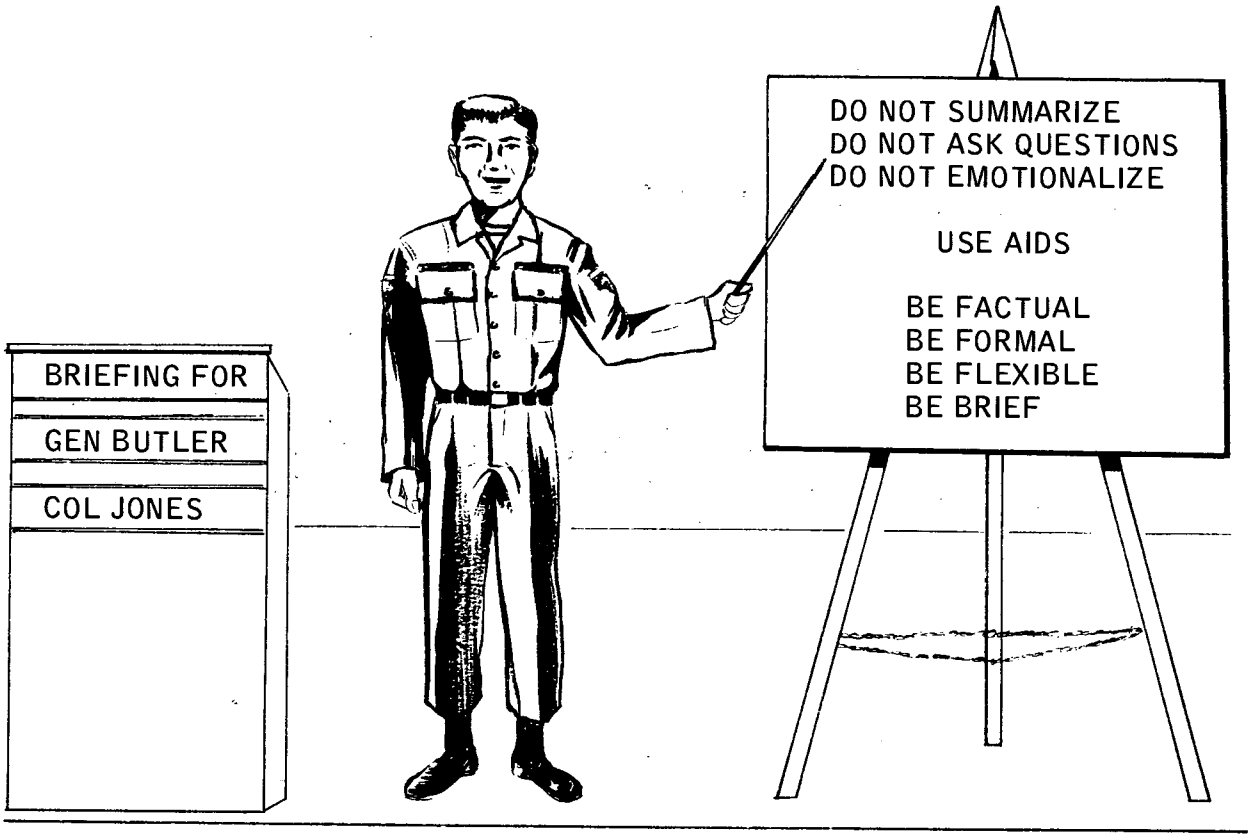

Figure 93. Presentation techniques.

figure 76 provide a suitable checklist for insuring that everything is ready for the actual briefing presentation. In consideration of the nature of the audience and the brevity of the situation, special attention must be given to the seating arrangement and other physical aspects.

88. Presenting the Briefing

a. General. The guidance given in chapters 4 and 5 should be prudently applied to the briefing situation. The briefer should exhibit confidence and sincerity and strive for an interesting and natural presentation; however, he should avoid colorful language, excessive enthusiasm, humor, and verbosity.

b. Briefing Tips.

(1) *Do not summarize.* Brevity of content implies that only important ideas are included. The restatement of main points for emphasis is not appropriate for a briefing audience.

(2) *Do not ask questions.* The idea of checking on audience understanding or any other use of questions by the briefer is out of place in this situation.

(3) *Do not emotionalize.* The briefer is not permitted to argue for his ideas. This approach is usually distasteful to a briefing audience.

(4) *Use aids.* Strive for smoothness in the use of simple aids that supplement the narrative and provide clarity.

(5) *Be factual.* The briefing must be an unbiased presentation of the facts.

(6) *Be formal.* The presentation should not be rigidly stuffy and dull; however, the briefer cannot assume a casual, highly informal attitude. His delivery can be natural and relaxed, yet one that is businesslike and systematic.

(7) *Be flexible.* Thorough preparation and resulting confidence gives the briefer the ability to react quickly to changes in time schedule, to searching questions, and to various attitudes of his audience.

(8) *Be brief.* Because the audience's time is valuable, the briefer must be concise in his presentation and in his answers to questions.

CHAPTER 15

TELEVISION

89. Policy

What is educational or instructional television? What can it do? What place does it have in instruction? How can instructors use it? What do they have to do in order to use television to advantage? This chapter is designed to answer these questions and to acquaint you with this particular instructor service.

a. Why Television? The Medium of Television Offers Many Advantages:

(1) Television saves time and resources and maintains or improves the quality of instruction. It accomplishes this by—

(*a*) Utilizing the best instructor in the subject and making him available to more classes.

(*b*) Video-taping repetitious hours for on-call use as required.

(*c*) Allowing the use of actual objects rather than large and costly mock-ups.

(*d*) Saving the time used in moving personnel to remote locations for demonstrations or to a central location such as theaters for films or special lectures.

(2) TV provides technical advantages for illustrating or demonstrating concepts not readily available in regular classrooms.

(*a*) Gives close-up magnification of small objects, equipment, parts, meters, mechanisms, diagrams, and so forth, so that each student has a "front-row" seat.

(*b*) Allows comparison of two or more illustrations, objects, or demonstrations, at the same time (split screen).

(*c*) Directs student's attention to the essential or preselected details, eliminating distracting objects or material.

(*d*) Brings equipment and demonstrations from remote locations into the classroom.

(*e*) Allows use of large, small, scarce, confined, or fixed equipment regardless of its location.

(*f*) Permits easy integration of pertinent film sequences, slides, graphics, and special training aids into TV presentations.

(3) It provides enrichment of training:

(*a*) Increases use of training aids.

(*b*) Increases interest and understanding of students.

(*c*) Provides a common grounding of all students in fundamental subject areas.

(*d*) Allows the instructor more time to teach detailed or practical applications of complex subject matter initially presented by television.

b. Limitations. The medium of television has certain limitations, which should be considered in determining its usefulness for training or information—

(1) TV generally is a one-way communication.

(2) TV subjects are not taught "just as the classroom instructor would teach them." TV can use special techniques of presentation, and may require rearrangement of subject sequence.

(3) TV cannot cover every subject desired. Time and economical use will not allow the presentation of every complex or specialized subject by TV.

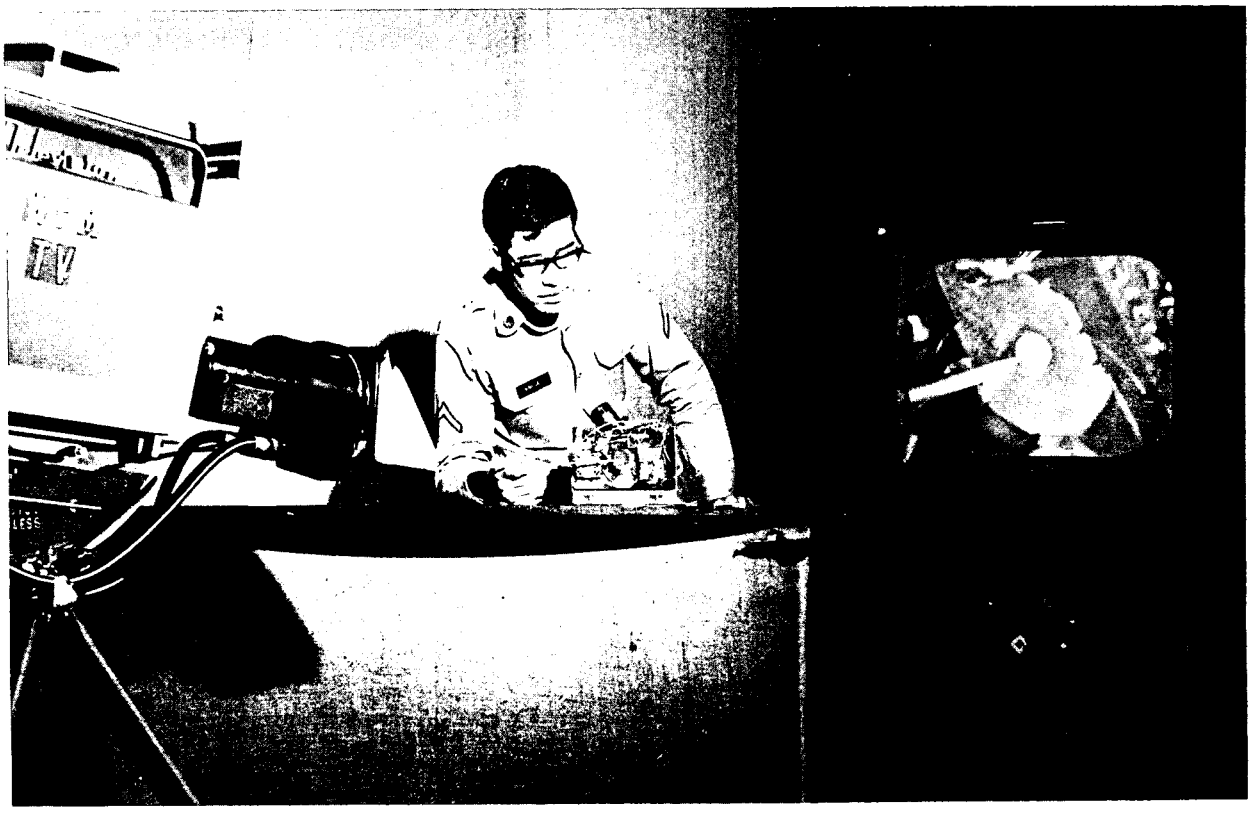

Figure 94. Each student has a front row seat.

Over a period of time, however, a library of useful TV tape presentations can be established requiring no additional production for continuing use.

(4) Military educational television (ETV) cannot provide elaborate dramatic or documentary productions due to limited facilities and staff. Training programs of this type require a great amount of time and extensive funds, and should be planned for production as training films, using motion picture techniques.

c. Where Does Television Production Start? Experience shows that most of the hours on television have been generated by instructor personnel. The instructor is motivated to television in a number of ways—

(1) Self-motivation is brought about with a natural desire to utilize the television cameras and screen to show or explain, in the most visual manner, some skill, theory, or problem.

(2) By seeing other television instruction.

(3) Or as a result of encouragement by supervisors.

d. Who is Responsible for Television Instruction Quality? There exists a pattern of responsibility as in any other medium of teaching. Generally, it is as follows:

(1) *Content.* This is the prime responsibility of the instructor. He is the expert in the area. The correctness of what is said or done rests with the instructor as it does in the classroom.

(*a*) Total teaching by TV of an entire skill, piece of equipment, or procedure is potentially TV's most effective utilization, especially if the learning process culminates in overt acts that can be objectively and qualitatively evaluated. The core of the material is presented by TV and

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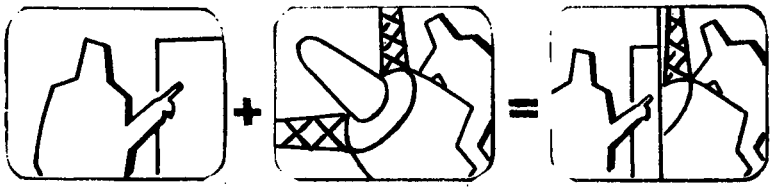
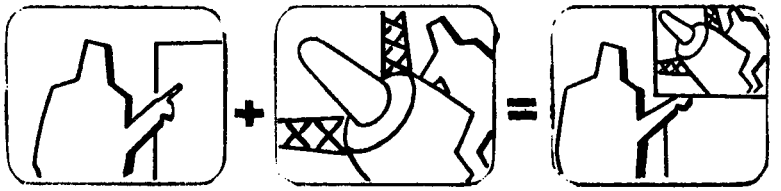
SPECIAL EFFECTS

Special picture effects can be shown easily by electronically blending different pictures from the video tape recorder and the slide-film chain or taken by the television cameras. Here are a few illustrations of this technique:

SUPER IMPOSURE



SPLIT SCREEN



CORNER INSERT

SUPERIMPOSURE

The briefer, facing the on-air camera, is using a chart to compare the differences between Functional Organization and the Systems Management Concept. At the proper moment, key words or phrases, placed on slides, are electronically superimposed over his picture, thus adding visual emphasis to his verbal explanation. For variation, the words to be superimposed can be electronically "wiped" into view.

SPLIT SCREEN

The briefer is citing statistics to demonstrate the relationship between maintenance costs and check-out procedures on the nose ring of an ICBM. By having one camera covering the briefer and by electronically inserting a film clip on the actual check-out procedures, the audience can observe both actions at the same time. In this case, the viewing screen is split down the center, permitting the two picture outputs to be placed side by side. The screen can also be split horizontally.

CORNER INSERT

In the same situation used for the split screen technique, the film clip of the check-out procedure could be electronically inserted in the corner of the picture seen by the audience.

Figure 95. Comparison of two or more illustrations.

Figure 96. Equipment and demonstrations brought from remote locations into classrooms.

appropriate time is left for the classroom instructor to deal with matters that cannot be handled by TV.

(*b*) Supplemental or adjunct teaching of excerpts of training material on TV is used to clarify a teaching point or support a segment of the total hour of instruction. This concept of TV use provides resources not available in a classroom due to time or space limitations. Hard to duplicate demonstrations, limited but special instruction, clarification of difficult supporting principles or theories, and quick but easy review of basic information are some of the areas adaptable to supplemental or adjunct TV teaching.

(2) *Technical.* The television staff has the responsibility to make every presentation technically correct by professional TV engineering standards and TV production techniques.

(3) *Academic quality.* As in all instruction the resident department staff and faculty has the prime responsibility for the quality of the academic hour. Review of all TV programing for doctrinal correctness cannot be delegated. Monitoring television rehearsals, presentations, and tapes must be accomplished for final approval.

e. TV Programing.

(1) *Establish priorities.* Priorities should go to TV programs or series that will solve known existing training problems through the more widespread use of superior instructor, the standardization of training, the greater utilization of expensive training equipment and aids, instructor savings, the reduction of training time, and the reduction of unprofitable student movement. The recording of expensive demonstrations should be assigned high priority.

(2) *Establish training objectives.* Training objectives oriented to desired terminal behavior of students or trainees should be established for each TV program prior to the onset of any produc-

tion activity. The validity of these objectives should be tested, using students, graduated trainees, of faculty. A systematic evaluation should be made of the tasks being taught and the value established by the TV program materially assisting in the achievement of identified skills.

(3) *Curriculum coordination and content approval.* Local coordination, and where necessary, coordination between Army service schools must insure that that each TV program is usable in the curricula for which it is being devised. Definite but simple coordination should be established to insure that TV objectives coincide with course training objectives. TV production must remain responsive to training needs.

(4) *Effectiveness evaluation.* In general, trial runs of programs ("live or test tape") to students prior to final recording creates the best opportunity for evaluation. Questionnaires, tests, staff and faculty observation, and tangible comparison with classroom instruction are some methods for evaluation of TV programs.

(5) *TV instructor development.* Formal training:

(*a*) All instructor training courses should include orientation material on TV teaching techniques, development of television programs, and classroom utilization of televised material.

(*b*) Special workshops should be conducted for selected instructors whose duties include teaching by TV.

(*c*) Whenever possible, the instructor training course should use TV to record and playback portions of each trainee's early practice teaching efforts. The objective of this training is to make the trainee visually aware of his strengths, weaknesses, or mistakes.

(*d*) Studio OJT. Specific training of individuals or small groups to teach on TV is better accomplished through intensive studio work, or by slightly longer OJT periods. "Hands on" experience with studio TV equipment will enhance instructor training courses.

(*e*) Special TV text. Recorded TV programs on how to teach by TV are good orientation vehicles for potential TV instructors.

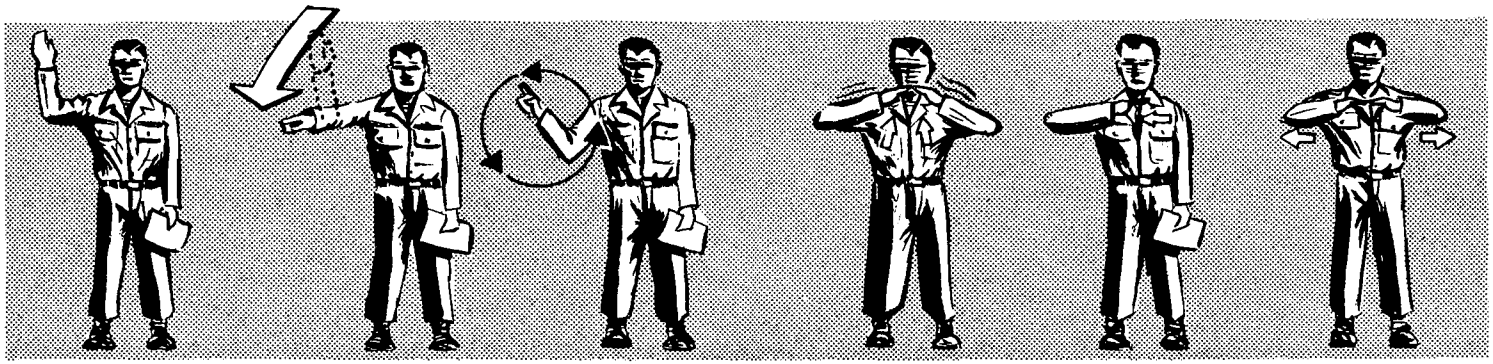
90. Production Procedures

a. The Television Production Staff. The instructor must understand the function and problems of the following positions.

(1) *Producer/director.* The individual the instructor will work most closely with is the producer/director has the responsibility of adapting the medium of television to classroom instruction. He will coach the instructor, plan the camera coverage, and suggest sets and props to develop the proper atmosphere for maximum return of instructor's effort and attendant student learning. He must insure that the instructor is familiar with studio procedures, sequences of action, positioning and handling of all visual material, and the meaning of visual and hand cues. The producer/director must have an understanding of instructor problems, respect for course content, and must be able to identify himself with the instructor. He conducts the preproduction conferences, studio rehearsals, and live presentations or tape recordings. During live or tape recordings, he is in complete charge of the television staff assigned to the program. He is responsible for the final picture continuity.

(2) *Floor manager.* The director and instructor's assistant in the studio during the program is the floor manager. He will handle "off-set" visuals or props, give necessary cues, and be alert to the requirements of the on-air program.

(3) *Cameramen.* The cameramen are re-



STAND BY CUE SPEED UP BRIGHTEN UP CUT SLOW DOWN

STUDIO HAND SIGNALS

The floor manager employs a sign language to communicate with the briefer and studio personnel during a rehearsal or telecast. These are the studio hand signals commonly used:

1. STAND BY
   The arm is upraised and so held until execution of the CUE. The STAND-BY is a warning that a cue is about to be given. Complete silence should be observed in the studio.

2. CUE
   The CUE is given by bringing the arm down from the STAND BY position and pointing with the index finger to the briefer. The CUE is used to initiate all on-camera action.

3. SPEED UP
   The index finger is moved in a large circle. The SPEED UP is used to signal the briefer to step up the pace of his delivery.

4. BRIGHTEN UP
   The hands are placed under the chin. This signal indicates briefer's facial expression is becoming dead pan and lacks interest or sparkle.

5. CUT
   The hand is drawn, palm down, across the throat. This signals a halt to all studio activity.

6. SLOW DOWN
   The hands are moved away from each other in a stretching gesture. The SLOW DOWN is used to signal the briefer to slacken the place of his delivery.

Figure 97. Visual and hand cues.

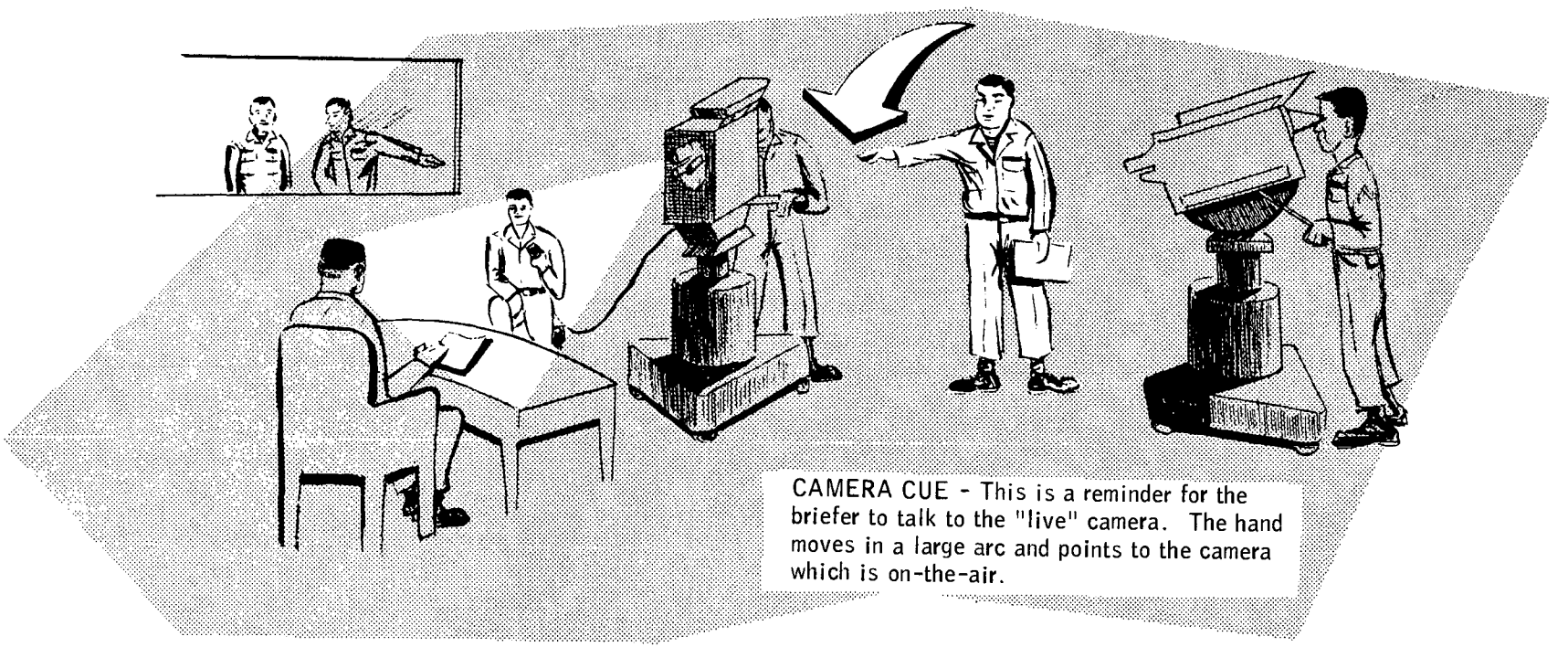


Figure 98. Floor manager gives necessary cues.

sponsible to the director for proper lens, focus, adjustments, and physical movement of the camera during rehearsals and programs.

b. Pre-production Conference. The first step in producing a television program is the pre-production conference. This is a meeting between the instructor and a producer/director. At this conference, method, special techniques, props, script, visuals, and other details will be discussed and tentatively agreed upon.

(1) *Techniques.* The techniques listed below are only a few of the ways in which television can be used. There is no limit to the possibilities. With the video tape recorder available you can involve more people for repetitious hours of instruction and have them when needed without requiring repeated instructor performance. It is not necessary to use any standard period of time on closed-circuit military television. Experience has shown that a 30-minute TV production properly prepared can accomplish the usual 50-minute classroom period. Two minutes or 30 minutes, the clock does not determine the length of TV usage. No ETV program, however, should exceed the scheduled academic period.

(*a*) *One-man presentation.* The most common technique is that of one instructor presenting the material. Additional instructors may be used in the presentation for assistance or change of pace or voice.

(*b*) *Demonstration.* A method or skill may be demonstrated.

(*c*) *Controlled practical exercises or "follow-me."* Timing of this type exercise need not present difficulty. Two methods are used for pacing. The first is based on the classroom experience of the instructor. Another tested technique is the use of student demonstrators. These demonstrators represent various skill levels and can follow the instruction either on or off camera giving the instructor a sense of proper pacing. Tapes should be "classroom" tested for pacing prior to final approval.

(*d*) *Student panels.* Selected students ask or answer questions.

(*e*) *Expert panels.* Persons with specific knowledge of a subject area can ask or answer questions.

(*f*) *Guest speakers.* An area specialist with or without training aids depending on the subject matter and skill of the speaker.

(*g*) *Skits.* Role-playing dramatizations. This type approach can do more with fewer words employed—show it, don't tell it.

(*h*) *Case studies.* Develop a subject area with this interesting classroom method.

(*i*) *Tests and examinations.* Conduct a functional or recognition test using the actual object.

(*j*) *Orientation or summary.* An hour or subcourse may begin with a lively orientation by television. Course content summaries may be done by television as well as exam or test critiques.

(2) *Props and sets.* Starting with the blackboard and the commonplace podium, any props or aids may be used. The producer/director can make suggestions in this area. The same applies to the set or background that you desire. Your director will help in this area.

(3) *Visuals and training aids.* Good pictures are essential to good television. This does not mean, of course, that visual aids must always be employed; some talks, discussion, or similar programs can be excellent television without further visualization. Most instructional or informational programs, however, should be carefully and well illustrated, since the TV medium offers a wide opportunity to use good visual material.

(*a*) You should use training aids or visual materials for one or more of the following purposes:

1. To arrest the attention of the viewer.

2. To capture and reinforce his interest.
3. To illustrate functions, methods, ideas.
4. To increase understanding and clarity of ideas.
5. To convey visual information.
6. To make your presentation more varied and dramatic.
7. To contribute to the setting of scene or mood.

(*b*) Use visual illustrations as often as the content of a program dictates, but you should not use meaningless or insignificant visual materials simply for the sake of using them. Ideas, functions, terms, and words that you may not be able to illustrate easily in the classroom can be illustrated on TV to avoid misunderstanding.

(*c*) Almost any type of training aid or visual aid can be used on television although some will require adaptation. Among the visual aids commonly available that can be used on TV are:

1. Equipment component parts.
2. Models or mockups of equipment.
3. Opaque charts, graphs, illustrations, or schematics.
4. Transparencies of all types—2 x 2 inches, 3¼ x 4 inches, overhead projector slides, operable transparencies or acetate overlay transparencies.
5. Film strips, 35-mm.
6. Motion picture films, sound, (complete or selected sequences).
7. Graphics, artwork, photographs, animated graphics.
8. Rear-screen projection materials of all types.
9. Special visual devices such as Technamation or cellomatic.
10. Chalkboards with "off-white" chalk may be used in a TV presentation. However, the same problem of chalk dust and erasing as exists in the classroom compounds itself in a TV studio. Roller devices using large brown wrapping paper and felt pens are usually available as a more efficient "chalkboard" without the attendant problems. Prepared materials may be rolled into view or material may be developed on air conveniently with this device.

(*d*) You should consider certain problems in the reproduction of visual aids through the television medium before you select or prepare such visuals. Among these are the following:

1. All colors in training aids or visual material will be reproduced in shades of gray on a black-and-white TV receiver. It is important that you select visual materials with sufficient gray scale contrast in each detail for good TV reproduction. Ask your director to advise you or check out any aid "on camera" prior to rehearsal. This problem occurs most frequently in—
   (a) Slides, films, filmstrips or transparencies without sufficient tonal contrast. Retouching, new prints, or substitution of other materials is required.
   (b) Close-ups of wiring and components of equipment that may not stand out visually. Special lighting, repainting of parts, or "exploded" views of objects are remedies.
   (c) Equipment with control knobs of the same gray scale tone. Repainting of controls in contrasting colors, and shooting and lighting at oblique angles are necessitated.
   (d) Schematics or illustrations in pastel colors. These may need bold line retouching or special lighting to bring out contrasts.
2. Surface texture of graphics is important. A matte finish is preferred. Glossy pictures of highly reflective surfaces will reproduce glare from TV lights. Glare can be prevented by careful placement, spraying with dulling waxes, and repainting or reproducing with dull finishes.

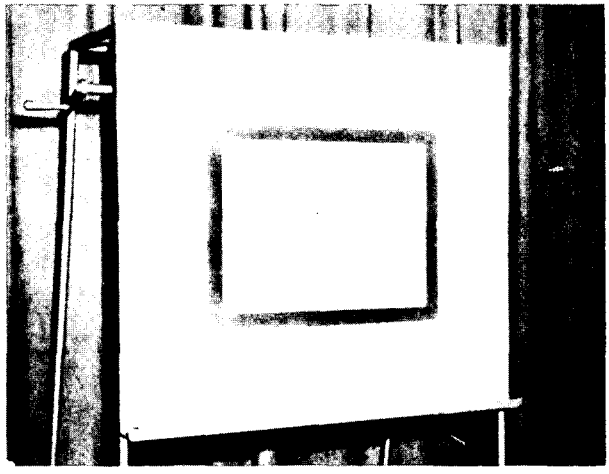


Figure 99. A more efficient chalkboard.

3. Excessive detail in visuals causes problems. Small lines or great variety of contrasts may tend to "wiggle" or run together. Visual materials used on TV should have simple detail, a few contrasting colors, firm or bold lines.

4. The TV system reproduces a picture 3 units *high* by 4 units *wide*. Graphics, visuals, any material to be picked up by cameras or projected should be prepared in an aspect ratio of 3 to 4. For example, all visuals should be 3 x 4 inches, 6 x 8 inches, or 9 x 12 inches, etc. When materials of other proportions are to be used, they should be mounted with sufficient borders to permit 3 by 4 framing.

5. Motion or suggestions of motion in visuals can reinforce attention and interest. Equipment may be moved by hand, placed on small turn-tables, or mounted to show dimensions or parts better. Graphics may be "animated" by using cutout areas with shutters, which can be pulled to reveal background detail, by using rubber bands or other spring devices, by stripping transparencies with special material, and using a revolving disk to show directional motion and similar effects.

(4) *Scripts.* A successful television production depends in part on the knowledge your producer/director has about your presentation. It is therefore necessary for you to provide him with a script or run down sheet. This should not be complicated or lengthy. The following describes the type scripts usually required:

(*a*) *Outline.* Qualified instructors can teach best from outlines, expanded in key areas to verbatim materials. Production rates are best and naturalness is retained in this type of script.

(*b*) *Semiscript.* This expanded outline best supports complicated subjects, particularly if the production plan involves extreme close-ups and intricate movements and camera changes. Semiscript, like the outline, is useful mainly to a qualified instructor.

(*c*) *Full script.* Full scripts are useful in programs where precise wording is needed to simplify, clarify, or relate. Full scripts also play a key role where dramatic effects, narration over films, accurate description of complicated, or carefully timed demonstrations are used. Full scripts are required when lessons are presented by persons who are not knowledgeable in the subject matter.

c. Rehearsals. Two types of rehearsals usually are accomplished during the preparation of any TV instructional presentation, either live or video taped.

(1) *Dry run.* This is a common term denoting those rehearsals conducted by the instructor for his own preparation. Another member of the proponent staff or faculty should sit to critique.

(2) *Camera rehearsals.* This is a dress rehearsal with all speech, action, and visuals employed. This is the step prior to taping the program. Director, cameramen, and engineers will be scheduled for this rehearsal. This rehearsal should take place shortly be-

TV SCRIPT		
SUBJECT: TELEVISION SCRIPT WRITING		
DAY AND DATE: 10 June 1966	DEPARTMENT: Director of Television	
NAME OF INSTRUCTOR: 1/Lt Robert C. Smith		
NAME(S) OF ASSISTANT INSTRUCTOR(S): M/Sgt Carl K. Jones SFC Manuel Small		
VIDEO	AUDIO	TIME
TITLE BOARD "TV SCRIPT WRITING: MS - 1st INSTRUCTOR (LT SMITH MS - SGT JONES MS - SGT SMALL LS - LT SMITH - MOVES TO DESK, PICKS UP SCRIPT FORM CU SCRIPT FORM	 INTRODUCES HOUR INTRODUCES SGT JONES INTRODUCES SGT SMALL THE FIRST THING WE NEED TO BE FAMILIAR WITH IS THE ACTUAL FORM -------. THE FORM IS DIVIDED INTO TWO COLUMNS - VIDEO - WHERE THE PICTURES ARE INDICATED AND AUDIO - WHERE THE TEXT IS WRITTEN.	

Figure 100. TV script.

fore the scheduled presentation. Necessary changes should occur at this time. It may also point up the need for more visual impact. Visualization may be accomplished even at this late date by such techniques as super-imposing words, split screen, or adding a blackboard sketch or listing. Many of these changes rest in the imagination you and your director can mutually bring to bear to overcome potential shortcomings in the instruction.

d. Presenting Educational TV Programs. Educational television depends upon effective communication. Skillful presentation of your program is, therefore, another prime requisite in making the program effective. Although content of the program is your first consideration, the presentation must capture and hold the interest and attention of your viewers. The participants on educational TV programs must be accomplished communicators rather than polished actors. An experienced, alert, and effective classroom instructor can adapt his teaching methods to the requirements of television in a short time. Your TV producer/director can guide you in using the best TV techniques.

(1) The following suggestions will be helpful to you:

(*a*) *Be prepared.* Have your ideas, your script outline, your training aids, props, display devices, and other resources well organized and in a workable arrangement. Work out any problems during rehearsals. Do not assume that something that failed to work properly in rehearsal

TV SCRIPT CONTINUATION SHEET	SUBJECT: TELEVISION SCRIPT WRITING	
VIDEO	AUDIO	TIME
MCU - SGT JONES	NOW SGT JONES WILL EXPLAIN THE ABBREVIATIONS FOR SHOTS.	
MS - SGT JONES & BLACKBOARD	SHOT ABBREVIATIONS CORRESPOND TO THE SIZE OR AREA OF THE PICTURE DESIRED.	
CU OF BLACKBOARD AS SGT JONES WRITES	CU - DESIGNATES A CLOSE UP MCU - MEDIUM CLOSE UP MS - MEDIUM SHOT LS - LONG SHOT	
MS - SGT JONES	THESE TERMS ARE FAIRLY SELF-EXPLANATORY. THEY ARE INDICATED IN THE VIDEO COLUMN ON THE LEFT.	
2 SHOT - LT SMITH & SGT SMALL	SGT SMALL WILL NOW EXPLAIN HOW TO INDICATE THE USE OF VISUALS IN THE SCRIPT.	

Figure 100—Continued.

will work during your presentation; correct or replace it.

(*b*) *Relax.* Try to be yourself. Remember that the TV camera projects your natural personality best, and the more relaxed and natural you are, the better you will reach your viewers. Don't try to "act," or to be too formal with your presentation. Be friendly, smile occasionally, use natural but not exaggerated gestures.

(*c*) *Don't hurry.* Allow ample time to cover each point you want to make, and remember to keep your ideas simple and direct. As stated previously, there is no prescribed time limitations for closed circuit educational TV as applied to military instruction, so take the time required to do a complete job. Your viewers cannot ask you to slow down, repeat a statement, or clarify some point that is vague. Vary the pace of your delivery to keep their attention, but do not race through your material. Allow time for an adequate summary at the end of the program.

(*d*) *Work to the camera.* The camera is the eyes of your viewers. Talk to it; establish eye contact with the camera lens when it is focused on you; show your illustrations clearly to the camera. Keep the illustration unobstructed and uncluttered.

(*e*) *Move naturally, but move.* Sit or stand naturally and comfortably,

TV SCRIPT CONTINUATION SHEET	SUBJECT: TELEVISION SCRIPT WRITING	
VIDEO	AUDIO	TIME
MCU - SGT SMALL	TELEVISION IS, OF COURSE, A VISUAL MEDIUM. THIS FACT DICTATES THAT SIMPLE, CLEAR, MEANINGFUL VISUALS MUST BE USED WHENEVER POSSIBLE.	
CU - PAPER ROLLER DEVICE	IN THE VIDEO COLUMN YOU SHOULD INDICATE WHAT TYPE OF VISUAL YOU ARE USING.	
CU OF EACH TYPE	THAT IS - A FLIP CARD, PICTURE, FILM CLIP, MAGAZINE, BOOK, ETC.	
LS - SGT SMALL & PAPER ROLLER DEVICE	WRITE THE TYPE OF VISUAL AND A BRIEF DESCRIPTION OF ITS CONTENTS IN THE VIDEO COLUMN. SO YOU COULD WRITE	
CU OF EXAMPLE	PICTURE # 1 (TWO SOLDIERS)	
MS - LT SMITH AT PODIUM	NOW A BRIEF REVIEW OF WHAT WE HAVE LEARNED TODAY.	

Figure 100—Continued.

but watch your posture. Move slowly but deliberately in order for the camera to follow your actions. The director will suggest any changes necessary.

(*f*) *Show.* Remember that TV is an excellent medium for illustrating your ideas, and almost demands that you *show* rather than simply *tell.* Do not feel that you must talk incessantly while you demonstrate something; pauses can be important. Do not talk for long periods without some illustration of what you are talking about.

(*g*) *Correct your errors* in a natural way but quickly. Do not call undue attention to an error.

(*h*) *Present your material* in the way you rehearsed it. Keep close to the form and timing of your outline. On-air changes will confuse your director and crew and will reflect on your presentation.

(*i*) *Placement of objects.* All display devices, pieces of equipment, illustrations, or training aids must be positioned so they can be picked up adequately by the TV camera. Flat graphics should be placed at a 90° angle to the camera; equipment and three-dimensional objects should be

TV SCRIPT CONTINUATION SHEET	SUBJECT: TELEVISION SCRIPT WRITING	
VIDEO	AUDIO	TIME
CU FLIP # 1 (EXPLANATION OF SHOT DESIGNATIONS)	THERE ARE FOUR GENERAL TYPES OF SHOTS.	
CU - FLIP # 2	VISUALS SHOULD BE INDICATED IN VIDEO COLUMN WITH BRIEF EXPLANATION OF ITS CONTENTS.	
MS - LT SMITH	WE HOPE WE HAVE MADE SCRIPT WRITING A LITTLE EASIER. IF THERE ARE ANY QUESTIONS, THE CLASSROOM INSTRUCTOR WILL ANSWER THEM FOR YOU.	
FADE TO BLACK		

Figure 100—Continued.

displayed at a slight angle or turned in some manner to show size, contour, texture, detail. Often it is necessary to place illustrations "in limbo" or apart from the TV instructor and sometimes, to use duplicate objects for close-ups, better lighting, etc. Your producer/director and floor manager will guide you in the proper way to place, hold, and move objects or visual materials.

(*j*) *Placement of persons.* Normally you should stand behind a display table or at one side of the display device you are using in order not to obstruct the camera view. For good TV picture composition, you must stand *close* to the device when both it and you are to be included in the picture. An established TV axiom is "if you're not touching (devices or persons), you're not in."

(*k*) *Pointers.* Some form of pointer is useful to designate detailed information on a chart or parts of equipment. This also gives a degree of motion to the picture. The instructor's hand or finger may be useful to show the size, shape, or contour of an object in close-ups.

(*l*) *Writing.* All written material consisting of more than a few words should be printed by a graphics illustrator before the presentation. This will be neater and will save valuable time during the presentation.

(*m*) *Projected materials.* All slides, transparencies, opaque graphics, etc., normally are handled in the studio by the floor manager or projected from equipment in the film room or studio. Your script should indicate when you want such material shown. When necessary, a TV set will be placed so you can see the projections.

(2) To look your best on TV, you should observe a few simple rules:

(*a*) Military personnel should wear proper uniforms. Campaign ribbons may be worn. Brass should not be polished too highly before a TV appearance for it will reflect lights and distract the viewers.

(*b*) Civilians should wear neat, well-pressed business suits of medium brown, gray, or blue tones. Avoid black and navy blue suits, which may wash out under TV lights. Pastel blue, gray, or tan shirts are preferred to white, which is reflective and may wash out facial features. Clothing that is distinctly seasonal and will "date" a program should be avoided.

(*c*) Accessories should be kept to a minimum. Metal cuff links, tie clips, and similar items should be avoided. Neckties should be conservative in contrasting colors with small stripes or patterns, or in solid shades. Eyeglasses may be worn on TV if you must wear them.

(*d*) Normally, no special makeup is used on men appearing on TV. Men should be clean shaven and may use a little neutral powder to tone down beard shadow, pale complexions, or facial glare. Fingernails should be clean and neatly manicured for close-ups.

(*e*) Women who appear on TV should be neatly dressed in medium shades, conservative clothes, with little or no reflective jewelry, and should wear normal street makeup with a medium shade of lipstick and nail polish.

91. Use of TV in Classroom Instruction

The effectiveness of television programs depends ultimately on how well the programs are presented in your classrooms! The final test of an educational TV program is in the usefulness and significance of the program to the intended audience. Here are some ways in which educational TV programs can be used effectively:

a. Include new instructional TV programs in lesson plans as a standard teaching aid. Make these programs do the job they are intended to do.

b. Review the background data on new programs before showing them to your classes. Watch previews of new programs. Schedule the showing of a program at a time when it can be of the greatest usefulness to you.

c. Determine how you can best integrate the program into your classroom instruction.

d. Get your class ready to see the program. Make certain they have adequate background or have reached the proper place in the instruction to understand the TV presentation. Suggest what they should look for in the TV program. Make certain they have all equipment necessary to understand or follow the TV presentation.

e. Watch your class while they view the program. Make certain they can see and hear well, that they view the program effectively, and that they take notes or follow any instructions given. Look for any expression that shows that the student does not understand some point of the program. This will necessitate your moving around the classroom in order to determine student involvement and attention.

f. The televising of an educational hour of instruction means little if the student does not learn. In order to make certain that the material is properly received, the classroom and students must be prepared. Remember the effectiveness of education depends ultimately on how well the instruction is presented in the classroom under the best controlled conditions possible.

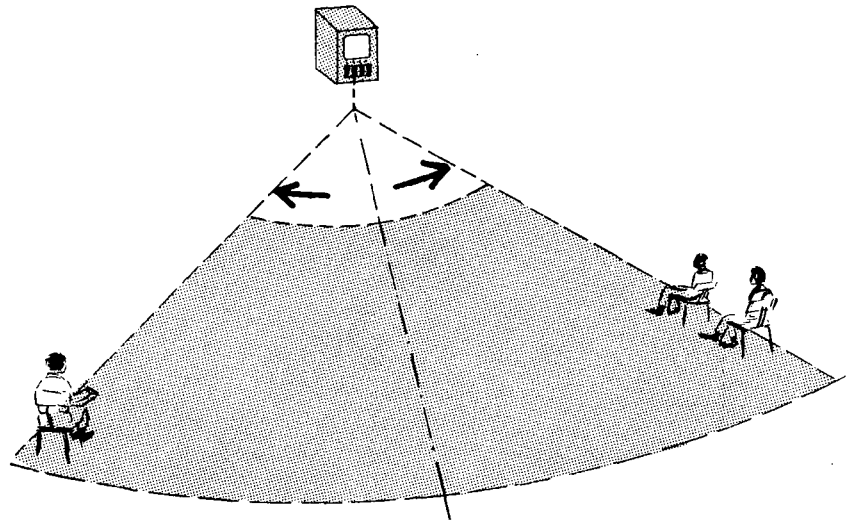
(1) Classroom preparation consists of—

(*a*) Proper ventilation.

(*b*) Temperature controlled where possible.

(*c*) Proper lighting. Some lights may be turned off to reduce TV set glare, but there should always be sufficient light in the classroom for note taking, writing, following of controlled practical exercise work, and for controlling class effort.

(*d*) Television sets must be adjusted in advance of class period. The sets in your classroom are operated exactly like your home television set. Check the schedule for the proper channel and select it. After the test pattern appears, adjust the sound level and the brightness and/or con-



HORIZONTAL VIEWING ANGLE

A line of vision not more than 45° from the axis is the maximum angle recommended for viewing most material. (If certain televised material requires an absolute minimum of distortion, the angle may be reduced to 40° or even 30°.)

FURNITURE AND SPACING BETWEEN

chair	tablet armchair	desk and chair
3 feet 0 inches	3 feet 0 inches	4 feet 4 inches	5 feet 2 inches

SIZE OF TV TUBE	NUMBER OF VIEWERS			
17 inches	32-34	21	20-23	16-18
19 inches	36-38	22	20-26	20-21
21 inches	52-54	31	31-36	24-29
23 inches	54-56	31	36-38	24-29

Figure 101. Horizontal viewing angle.

trast. A staff technician should be called if normal procedures fail to prepare a TV set for operation.

(*e*) Proper seating (figs. 101, 102).

(2) Role of classroom instructor—

(*a*) Passive viewing by students.

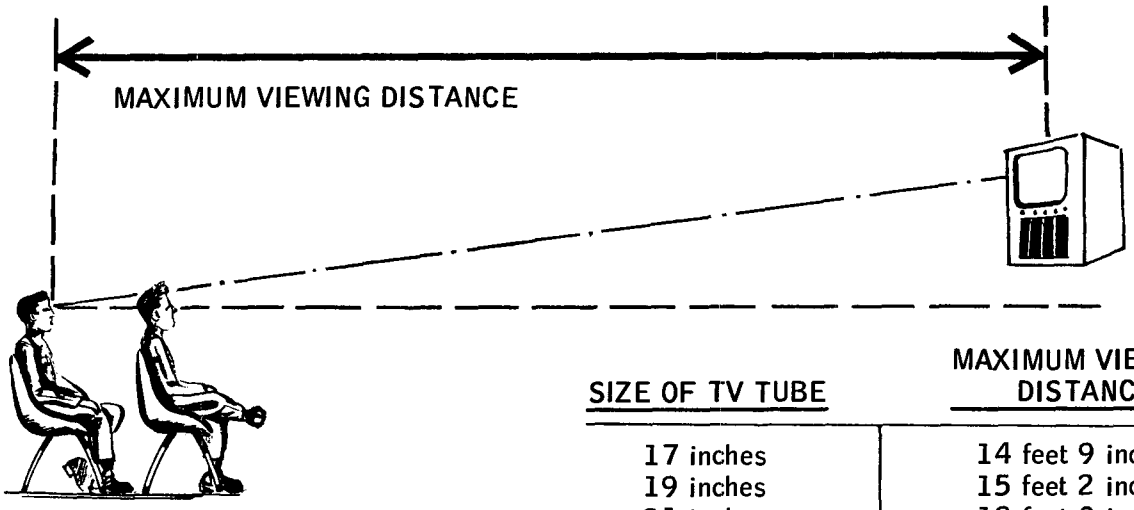
1. Assemble and control students.
2. Introduce subject of lesson.
3. Introduce TV program.
4. Summarize TV program.
5. Initiate and control discussion of TV program.
6. Present non-TV portion of lesson.
7. Summarize lesson.

(*b*) Active viewing by students.

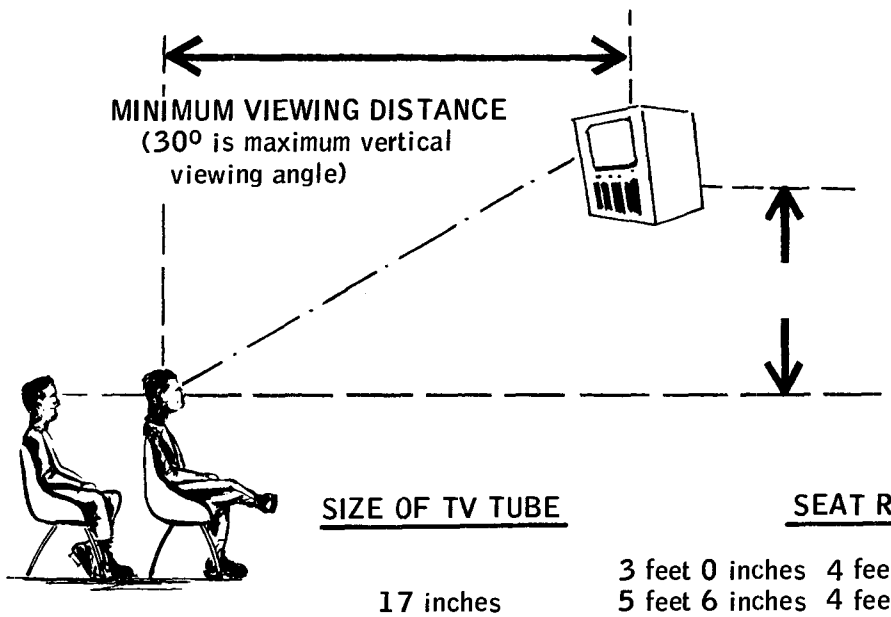
1. Prepare work sheets.
2. Check required equipment and tools.
3. Position the students.
4. Control student layout of tools, test equipment, supplies, etc.
5. Introduce TV program.
6. In progress—
(a) Answer questions.
(b) Observe students and identify problem students.
(c) Adjust malfunctioning equipment.
(d) Insure safety practices.
(e) Assist students having manipulatory difficulties.

(3) Following the TV presentation, review the main points briefly, if you feel this

VIEWING DISTANCES



SIZE OF TV TUBE	MAXIMUM VIEWING DISTANCE
17 inches	14 feet 9 inches
19 inches	15 feet 2 inches
21 inches	19 feet 0 inches
23 inches	19 feet 4 inches



SIZE OF TV TUBE	SEAT ROW SPACING		
17 inches	3 feet 0 inches	4 feet 4 inches	5 feet 2 inches
19 inches	5 feet 6 inches	4 feet 2 inches	3 feet 9 inches
21 inches	5 feet 8 inches	4 feet 4 inches	3 feet 10 inches
23 inches	7 feet 1 inch	5 feet 5 inches	4 feet 10 inches
	7 feet 2 inches	5 feet 6 inches	4 feet 11 inches

Figure 102. Viewing distances.

necessary, and clarify any questions that the students may have. Do not try to repeat everything that was shown on TV.

(4) Be prepared to pick up the lesson and apply the ideas or methods shown on TV to your classroom work—and to carry the students further.

92. Glossary of Television Terms

ASPECT RATIO—Applies to visual or training aids. The aspect ratio is 4 units wide to 3 units high.

AUDIO—The sound or audible component of TV.

BOOM (MICROPHONE)—A mechanical device used for lowering, raising, extending, or retracting a microphone or series of microphones.

CLOSED-CIRCUIT TV (CCTV)—System in which only receivers on the coaxial cable receive the TV signal.

COAXIAL CABLE—Cable that transmits the TV signals.

CONTRAST—Used to express the light value between the lightest and darkest parts of a picture.

CUE—Direction to begin, terminate, or change action. Relayed by floor manager or cameraman from the director.

DISTRIBUTION—The process of getting the TV signal from studio to classroom receivers.

FILM CLIP—A selected segment of film for insertion in a program.

FLIPCARD—Card containing information to be picked up on camera, standard size 11 x 14 inches.

FRAME—The outer edges of the TV screen.

GRAY SCALE—Variations in value from white, through shades of gray, to black on a television screen.

KINESCOPE RECORDING—A 16-mm motion-picture film recording of a television program.

LENS—A piece of optical glass with 1 or 2 curved surfaces and 1 flat surface, that is used to converge or diverge light rays passing through it.

LIVE TV—Action taking place before the TV camera at the time of transmission.

MICROWAVE—Highly directional radio signal linking remote equipment to the studio.

MOBILE UNIT—A truck or trailer containing television equipment to permit the pickup of programs in the field. Can be recorded on video tape or transmitted live by microwave (see fig. 96).

MULTIPLEXER—A device that permits the use of a combination of TV film and slide projectors with only one TV camera.

NARRATOR—An off-camera or background voice.

ON CAMERA—In front of a live camera.

REMOTE PICKUP—Pickup from a location other than the TV studio.

SCRIPT—A written guide for a TV program. (See figure 100.)

SET(S)—The area or areas in which a scene is enacted.

SHOT—A single picture taken on one camera.

SHOTS—Camera shots are named for the number of individuals in the scene (ONE-SHOT, TWO-SHOT, etc.), position from which the camera views the object (HIGH-SHOT, LOW-SHOT, OVER-THE-SHOULDER SHOT, etc.), or portion of the object in the scene (FULL-FIGURE SHOT, WAIST-SHOT, or MEDIUM-SHOT, HEAD-SHOT, or CLOSE-UP, etc.).

SLIDE—A picture or title for direct projection into TV system. Usually refers to a slide of the 2 x 2 inches dimension.

SPLIT SCREEN—The viewing screen is split down the center to permit two actions, i.e., cause and effect, side by side. The screen can also be split horizontally (see fig. 95).

STANDBY—A vocal direction, indicating that the program is about to go on the air.

STUDIO HAND SIGNALS—A sign language used to communicate with the personnel on camera or in the studio (see fig. 97).

SUPERIMPOSE—The overlapping of 2 pictures from 2 different cameras blended into 1 scene on the television set. (Often used with titles and captions.)

SWITCH—To cut from the picture on one camera to the picture on another. This is accomplished by the director.

TALK-BACK—Use of an intercommunication system to provide voice contact between the control room and the studio or between studio and classroom to permit students to ask questions of the television instructor.

TALLY LIGHT—Red lights on the television cameras to inform TV instructors and crew members when a particular camera is *on the air.*

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VIDEO—Refers to the picture components of a television system.

VIDEO-TAPE RECORDER (VTR)—A machine that records both the audio and video signals of a television production on a special magnetic tape. It also plays back taped programs.

ZOOM LENS—A special lens that allows the cameraman to move the field of view closer to the subject (zoom in) or away from the subject (zoom out). The focus of the lens is constant during either operation.

APPENDIX A

REFERENCES

TM 11–487F	Directory of U. S. Army Signal Equipments: Pictorial Equipment.
DA Pam 108–1	Index of Army Motion Pictures, Filmstrips, Slides, Tapes, and Phono-Recordings.
DA Pam 310–3	Index of Doctrinal, Training, and Organizational Publications.
AR 108–6	Motion Picture Production.
AR 108–30	Operation of Army Audio-Visual Communication Centers.
AR 350–15	Military Training Aids.
AR 350–340	Training Aids Center System.
AR 420–70	Repairs and Utilities—Buildings and Structures.
TA 11–12	United States Army Photographic Facilities and Audio-Visual Communication Centers.

APPENDIX B

LESSON OUTLINES FOR AN INSTRUCTOR TRAINING COURSE

Note. Transparencies cited in lesson plans in most instances are figures in this manual.

INSTRUCTIONAL UNIT: Welcome—The Army Instructor.

TYPE: Lecture, conference, and practical exercise.

TIME ALLOTTED: 2 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: Annex A (one per student).

PERSONNEL: CO and one instructor.

TRAINING AIDS: Overhead projector and transparencies 1–5.

REFERENCES: FM 21–6, para 3–7.

STUDY ASSIGNMENTS: None.

STUDENT UNIFORM AND EQUIPMENT: As prescribed by training schedule.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. WELCOME (Lecture—10 minutes)
   Note. Should be presented by the unit commanding officer.
2. ORIENTATION ON ADMINISTRATIVE DETAILS OF COURSE (Lecture—10 minutes)
   a. Review of schedule:
      (1) Conference instruction.
      (2) Practical work.
         Note. Issue student lesson requirements and explain.
   b. Grading system and performance standards required for graduation.
   c. Facilities and equipment available.
   d. Issue of texts and materials.
      Note. Above outline should be adapted to specific situation.
3. BIOGRAPHICAL SKETCHES BY STUDENTS (Practical exercise—50 minutes)

a. Directions to Students. When you are called on, come before the class and present your rank, name, duty assignment, and a short military history of yourself. Time per student will be 1 minute.

b. Presentation by Students.

4. THE ARMY INSTRUCTOR (Conference—25 minutes)
   a. Characteristics of the Good Instructor.
      Note. Show transparency 1. Strip. (Fig. 2.)

(1) Knowledge of subject. Must know:
(*a*) Doctrine and procedures prescribed in official training literature.
(*b*) Extent of prior and subsequent instruction on subject.
(*c*) Field application.
(2) Knowledge of methods and techniques of instruction.
Note. Explain that this is why they are attending this MOI course.
(3) Acceptable personality.
QUESTION: What personality traits do you like in an instructor?
(4) Leadership.
(*a*) Control and manage the class.
(*b*) Set an example.
(5) Professional attitude.

b. How the Instructor Can Improve.

Note. Show transparency 2. Strip. (Fig. 3.)
(1) Know what makes good instruction. Set high standards for yourself.
(2) Observe other instructors.
(3) Analyze your own characteristics.
(4) Concentrate on specific elements.
(5) Seek help of associates.
(6) Make a constant effort to improve.

c. Characteristics Common to Most Students. Think of your students as being:

Note. Show transparency 3. Strip. (Fig. 4.)
(1) Mature.
(2) Sincere.
(3) Practical-minded.
(4) Discerning.
(5) Different.

d. Pitfalls to Avoid.

Note. Show transparency 4. Strip. (Fig. 5.)
(1) Never bluff.
QUESTION: What will you do when a student asks you a question to which you do not know the answer?
(2) Never use profanity or obscenity.
QUESTION: Why is this important?
(3) Never use sarcasm or ridicule.
QUESTION: How will you handle a student you suspect is trying to "sharpshoot" you?
(4) Never talk down.
(5) Never lose patience.

5. REVIEW (Conference—5 minutes)

a. Clarification of Student Questions.

b. Summary.
(1) Administrative details.
(2) The Army instructor.
(*a*) Characteristics of a good instructor.
(*b*) Ways an instructor can improve.

(*c*) Characteristics common to most students.
(*d*) Pitfalls to avoid.

Note. Question students on the above 4 points.

c. Closing Statement. Your role as an Army instructor is an important one. The combat success of the Army depends upon the effectiveness of its instructors. You are the keystone in the training arch.

Note. Show transparency 5. (Fig. 1.)

Annex A—Student Lesson Requirements.

WELCOME—THE ARMY INSTRUCTOR

Annex A to Lesson Plan

STUDENT LESSON REQUIREMENTS

1. GENERAL

a. The practical work of the course is designed to give you experience in planning, presenting, and evaluating instruction.

b. To expedite the scheduling of student presentations, the class will be divided into sections. Schedules designating section, date, time, and place will be issued before each presentation.

c. You are responsible for obtaining or making all training aids used in your presentations. After your presentation, erase all chalkboards. If you need an assistant instructor, select him from your own section.

d. Each presentation will be timed. You should prepare your subject to allow adequate coverage in the time allotted. Any deviation in excess of 2 minutes from the assigned time will result in a grade reduction.

2. REQUIREMENTS

a. The Introduction.

(1) This exercise requires you to present an introduction to a unit of instruction that is taught by your department or organization. You will include in your introduction a statement of the objectives of the class and reasons for the class to learn the subject. Strive to gain the attention and interest of the class in your introduction.

(2) Remember, the introduction prepares the class for the material to be presented. Do not attempt to present the subject matter implied by your assigned topic; just give a 3- to 5-minute introduction to that topic.

b. Use of the Chalkboard.

(1) You will plan and present a 10-minute lesson on a unit of instruction that is taught by your organization. You will use the chalkboard during your presentation to illustrate teaching points.

(2) The lesson should be a complete unit. That is, it should contain an introduction, an explanation, and a summary.

(3) The instructor and students will critique.

c. Short Lesson Presentation.

(1) You will plan and present a 15-minute lesson on a unit of instruction that is taught by your organization. The lesson should be a complete unit. It should be supported by appropriate student-made training aids. Use actual equipment or models if appropriate.

(2) The instructor will designate a student critic for each presentation. Each critique will be graded.
(3) At the conclusion of the student critique, the instructor will critique the lesson.
(4) You will submit a lesson plan for grading to the instructor at the conclusion of your lesson.

d. Long Lesson Presentation.

(1) You will plan and present a 35-minute lesson on a unit of instruction that is taught by your organization.
(2) The instructor will designate student critics who will conduct critiques as in the short lesson.
(3) The instructor will critique the presentation.
(4) When possible, student lessons will be presented in the classrooms, shops, or areas where such training is normally taught.
(5) You will submit a lesson plan for grading to the instructor at the conclusion of your lesson.

INSTRUCTIONAL UNIT: Principles of Instruction.

TYPE: Conference and examination.

TIME ALLOTTED: 1 hour.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL:

a. Instructor.

b. Assistant instructor.

TRAINING AIDS: Overhead projector and transparencies 1–2, Venetian blind chart.

REFERENCES: FM 21–5, chap. 3.

STUDY ASSIGNMENT: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Uniform as prescribed, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. PRESENTATION (30 minutes)

a. Introduction (3 minutes).

(1) *Objective.* Be able to—

(*a*) Explain the nature of learning.

(*b*) Explain the instructional process.

(*c*) Define each of the principles of instruction and give examples of their use.

(2) *Reasons.*

(*a*) How a student learns must be considered in the application of methods and techniques of instruction. Principles are as basic to methods and techniques of instruction as they are to tactics.

(*b*) The fundamental elements are present in every instructional situation. They are the student, the instructor, and the teaching process. For you to plan and present effective instruction, it is necessary that you understand each of these fundamental elements and its relationship to the other two.

b. Explanation (27 minutes).

(1) *The general nature of learning.*

(*a*) Instruction is the sum total of all instructor activities that contribute to student learning.

(*b*) Learning is the process of acquiring new knowledge, skills, and appreciations that enable the individual to do something he couldn't do before, or to do it better.

(*c*) The senses are the channels through which we learn. Lessons that appeal to a variety of senses are most effective.

(*d*) Outcomes are—

1. Knowledge.
2. Skills.
3. Attitudes.

(2) *The instructional process.* The instructional process is a three-stage process of presentation by the instructor, application by the student, and evaluation by the instructor. It is the foundation on which a single lesson or an entire course is built.

Note. Show transparency 1. (Fig. 6.) Strip.

(*a*) Presentation—tell and show.
(*b*) Application—response and practice.
(*c*) Evaluation—formal and informal testing.

(3) *The principles of instruction.* The seven principles of instruction describe the conditions that promote efficient learning. They serve as a guide to the instructor in his selection and use of methods and techniques. They are—

Notes. 1. Following explanation, call on students to define and give examples.
2. Use Venetian blind chart, Principles of Instruction. (Fig. 7.)

(*a*) *Motivation.* Desire of the student to learn is an important factor in the teaching-learning process. Without motivation, students learn little. Ways to develop motivation are—

Note. Show transparency 2. (Fig. 9.)

1. Show a need.
2. Develop an intent to learn.
3. Maintain interest.
4. Encourage early success.
5. Give recognition and credit.
6. Avoid emotions that hinder learning.
7. Use competition.
8. Use rewards and punishments.

(*b*) *Objective.*

1. Learning is more effective when the student knows exactly what he is to learn and what is expected of him.
2. Lesson objectives:
   (a) Direct student learning efforts.
   (b) Show how the lesson fits into the overall course of instruction.
3. More interest is created when the student knows what to look for and how the instruction prepares him for his job.

(*c*) *Response.*

1. A student learns only what he responds to.
2. His responses take the forms of listening, observing, reading, recalling, taking notes, reciting, practicing, and solving problems.
3. In every period of instruction, students must be required to respond frequently in a form that can be observed and evaluated by the instructor.

(*d*) *Reinforcement.*

1. For efficient learning, a student must know whether his responses are right or wrong.
2. Ideally, a student should know whether he is right or wrong

immediately after each response; the longer the delay, the weaker the reinforcement becomes.

3. This principle is an important aspect of the *evaluation* stage of instruction.
4. The evaluation should be concurrent with the presentation and application stages of instruction.
5. Formal examinations at the end of an hour or a phase of training will not adequately accomplish the principle of reinforcement.

(*e*) *Realism.* The more realistic the learning situation, the more effective the learning. Each lesson, or main point of a lesson, should be subjected to the test of these questions.

1. Is this the way this material will be used by the soldier in actual practice?
   (a) The material must be realistic from the standpoint of its field application.
   (b) During the introductory phase of instruction, efforts at realism should not obscure learning fundamentals.
2. Is my presentation realistic as far as the level of the class is concerned?
   (a) Instruction beyond student understanding is unrealistic.
   (b) Make instruction realistic by using such personal references as "Here's what this means to you," or "You will use this in this way."

(*f*) *Background.* A student learns by building upon what he already knows.

1. Learning is based upon experience.
2. New subjects should be discussed in light of things familiar to the student, either through civilian or military training.
3. Consider state of training of student.
4. Review and make references to lessons already learned.

(*g*) *Incidental learning.*

Note. Develop from class.

1. Effective instruction produces proper attitudes, appreciations, interest, ideals, and habits of conduct.
2. The instructor's real task is to train men, not merely to teach subject matter.
3. Incidental learning is essential to the overall training objective. Students learn many things from instruction in addition to the material presented.

Note. Ask for questions. Summarize principles of learning.

2. EXAMINATION AND CRITIQUE (15 minutes)

3. REVIEW (5 minutes)

a. Clarification of Student Questions.

b. Summary.

(1) The nature of learning.
(2) The basic instructional process.
(3) The principles of instruction.

c. Closing Statement. Apply the principles of instruction and the stages

of instruction as guides to the selection and use of methods and techniques. Remember that only when your students learn do you succeed as an instructor.

INSTRUCTIONAL UNIT: Presenting Oral Instruction.

TYPE: Conference and practical exercise.

TIME ALLOTTED: 2 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Overhead projector and transparencies 1–6, chalkboard.

REFERENCES: FM 21–6, para 12–16.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

a. Review.

(1) Stages of instruction.
(2) Principles of instruction.

b. Reasons.

(1) Oral instruction is used in all stages of military training.
(2) You must know how to introduce a unit, develop teaching points in the explanation, and summarize material properly to accomplish your job effectively as an instructor.

c. Objectives. Be able to—

(1) Introduce a lesson effectively.
(2) Explain techniques of proper organization, transitions, interest, and emphasis in the explanation.
(3) Explain contents of a final summary.

2. EXPLANATION (80 minutes)

a. The Introduction (45 minutes).

(1) The introduction is needed to:

Note. Show transparency 1. (Fig. 16.)

(*a*) Establish contact.
(*b*) Stimulate interest and gain attention.
(*c*) Disclose and clarify the subject.

Note. Develop from class how the above purposes can be accomplished. List on chalkboard and give examples.

(2) Every introduction must include:

Note. Show transparency 2. (Fig. 18.)

(*a*) *Objectives.* What is to be learned?

1. State in behavioral terms.

EXAMPLES: 1. Be able to write an operations order.
2. Be able to identify a unit's size, type, and parent organization from a military symbol.

2. When appropriate state conditions and standards.

EXAMPLE: Be able to read accurately color-coded resistors with the aid of a chart.

(*b*) *Reasons.* Why it is important for students to learn the lesson objectives.

(3) The introduction may include—

(*a*) *Review.* Relationship between this unit and previous instruction.

(*b*) *Procedures.* Methods the instructor will use in teaching the lesson.

QUESTION: What principles of learning are applied by using elements of the introduction?

Note. Devote 30 minutes to developing the introduction in the classroom. (See annex A.)

b. The Explanation (25 minutes).

(1) *Organization.*

(*a*) Have a logical order.

(*b*) Limit main points.

(*c*) Use teaching vehicle, if appropriate.

Note. Show transparency 3. (Fig. 19.)

(2) *Transitions.* Each main point should be introduced, explained, illustrated, and summarized.

Note. Show transparency 4. (Fig. 20.) Give examples.

(*a*) Use frequent summaries.

(*b*) Refer to the objective.

(*c*) Use connective words or phrases.

(*d*) Use rhetorical questions.

(*e*) List or enumerate points.

Note. Emphasize the necessity for using a variety of transitional techniques.

(3) *Interest.* Interest will be enhanced by—

(*a*) Specific explanation.

(*b*) Illustrations, stories, and examples.

(*c*) Rhetorical questions.

(*d*) Training aids.

(4) *Emphasis.* Gained by:

Note. Show transparency 5. (Fig. 21.)

(*a*) Repetition.

(*b*) Speech techniques.

(*c*) Vivid phraseology.

(*d*) Questioning.

(*e*) Training aids.

c. The Summary (10 minutes).

(1) When to use summaries.

(*a*) Throughout the lesson.

(*b*) At the end of the lesson.

(2) How to make a final summary.

Note. Show transparency 6. (Fig. 22.) Give example.

(*a*) Clarify student questions.

(*b*) Recap main lesson objectives.
(*c*) Make a strong closing statement.

3. EXAMINATION AND CRITIQUE (15 minutes)

4. REVIEW (2 minutes)

a. Clarification of Student Questions.

b. Summary.

(1) Introduction.
(2) Explanation.
(3) Summary.

c. Closing Statement. The effectiveness of any instructional method or teaching procedure depends upon the degree of interest that it arouses and holds, the thinking that it stimulates, and the activity—mental or physical—that it encourages. These outcomes are brought about by the instructor's intelligent and varied use of the materials that have been presented in this unit. A good introduction, a clear explanation, and an effective summary are essential to effective teaching.

Annex A—Instructions for Developing Introduction Techniques in Class.

PRESENTING ORAL INSTRUCTION

Annex A to Lesson Plan

INSTRUCTIONS FOR DEVELOPING INTRODUCTION TECHNIQUES IN CLASS

1. During this exercise, call upon a student to introduce a designated subject. At the conclusion of the introduction, have the class critique the student introduction. Then present a demonstration introduction on the same subject. This procedure will continue throughout the allotted time (30 minutes).

2. Subjects to be introduced may include:

a. Track maintenance (care and adjustment).
b. First aid (bandaging).
c. Machinegun (nomenclature).
d. Map reading (grid system).
e. Radio set (nomenclature).

Break—End of first hour.

INSTRUCTIONAL UNIT: Speech Techniques.

TYPE: Conference.

TIME ALLOTTED: 1 hour.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, one assistant instructor.

TRAINING AIDS: Overhead projector and 5 transparencies.

REFERENCES: FM 21–6, para 17–25.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook, and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

a. Reasons. The effective military leader must be able to apply good speech techniques in all activities in which he must communicate ideas to others. The ability to speak effectively is essential not only to personal military leadership but also to efficient instruction.

b. Objectives. Be able to—

(1) Explain how to keep contact.
(2) Explain ways of controlling nervousness.
(3) Demonstrate proper bearing.
(4) Demonstrate common mannerisms.
(5) Explain what an instructor can do to insure that all students can hear.
(6) Explain factors that make a speaker easy to understand.

2. EXPLANATION (32 minutes)

a. Essentials of Communication.

(1) *Knowledge of subject.*
(*a*) Be thoroughly prepared.
(*b*) Don't try to bluff your way through a subject.
(*c*) Develop a background and depth in your subject.

(2) *Personality.*
(*a*) Speak with the full resources of your personality.
(*b*) Be sincere. Develop a genuine interest in your students.
(*c*) Don't indulge in sham or artificiality.

(3) *Effective speech techniques.*
(*a*) Know the techniques of effective speech that will be explained and demonstrated during this period.
(*b*) Practice these techniques.

b. Techniques of Delivery.

(1) Get contact with the students and keep it.

Note. Show transparency 1. (Fig. 23.)

(*a*) Be sure you have the attention of the class before starting. Ask for their attention. Be physically alert.

(*b*) Look at and talk to the class. Avoid overuse of notes.

(*c*) Be conversational in your delivery.

(*d*) Be alert to the class. Don't talk down to your students.

(2) Control nervousness.

Note. Show transparency 2. (Fig. 24.)

(*a*) Be thoroughly prepared; have a plan to follow.

(*b*) Assume the proper mental attitude.

(*c*) Have initial remarks well in mind.

(*d*) Review previous instruction.

(*e*) Tell a story.

(*f*) Be deliberate; slow down. When nervous, there is a tendency to speed up.

(3) Maintain bearing.

Note. Show transparency 3. (Fig. 25.)

(*a*) Check appearance before class.

(*b*) Maintain good posture; don't slouch.

(*c*) Make movements decisive and purposeful.

(*d*) Deliver your instruction with the total physical resources you have available. Don't restrict your delivery.

(4) Avoid mannerisms that distract. The guiding rule here is—avoid those things that cause the class to concentrate upon you and what you are doing rather than on your subject.

Note. Demonstrate typical mannerisms.

(5) Be enthusiastic.

Note. Show transparency 4. (Fig. 27.)

(*a*) There is no substitute for a physically vital and enthusiastic delivery. Enthusiasm is contagious.

(*b*) Believe in what you teach and, through voice and action, show it.

(6) Be sure you are heard.

(*a*) Have an assistant in the rear of the class signal you when volume is not adequate.

(*b*) Vary volume. Sustained loudness can anesthetize; prolonged softness lulls to sleep.

(7) Be sure you are understood.

Note. Show transparency 5. (Fig. 29.)

(*a*) Develop a sense of communication. Speak ideas, not words. Phrase ideas in simple sentences and common words.

(*b*) Vary rate of speech to suit the subject matter and the students' understanding.

(*c*) Pause to punctuate, not to mutilate.

(*d*) Enunciate clearly and pronounce correctly.

3. REVIEW (15 minutes)

a. Clarification of Questions.

b. Summary.

Note. Call on students to explain or demonstrate each of the lesson objectives.

c. Closing Statement. The application of the techniques considered will

enable the instructor to do a creditable job of speaking. He should develop a sense of communication when he speaks; he should deliver his ideas with physical vitality, enthusiasm, genuineness, and earnestness, and he should speak with the full resources of his personality. Good speech is one important factor contributing to good instruction.

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INSTRUCTIONAL UNIT: Introductions.

TYPE: Practical exercise.

TIME ALLOTTED: 3 hours. First hour—five student presentations; second hour—six student presentations; third hour—five student presentations. Based on 48 students divided into 3 sections of 16 students each.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Student-made.

REFERENCES: FM 21–6, para 12–14, 17–25.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: As prescribed by training schedule.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (2 minutes)
   a. *Reasons.*
      (1) Introduction sets the stage for instructor's presentation.
      (2) Introduction serves threefold purpose:
         (*a*) Establishes contact.
         (*b*) Arouses interest and secures attention.
         (*c*) Discloses nature of the subject.
   b. *Objective.* To learn by practice and observation, how to—
      (1) Plan an effective introduction.
      (2) Present an effective introduction.

2. EXPLANATION (6 minutes)
   a. *Points To Be Observed.*
      (1) Contact.
      (2) Interest.
      (3) Attention.
      (4) Elements.
         (*a*) Reasons.
         (*b*) Objective.
         (*c*) Other elements.
   b. *Administrative Information and Instructions.*
      (1) Presentation to be graded.
      (2) Introduction to be critiqued by instructor and students.
      (3) Explanation of subject matter not to be included.

3. APPLICATION (137 minutes)
   a. *Introduction of Subject by Student* (5 minutes).

(1) Class observes and make notes for critique.
(2) Instructor evaluates introduction, using supervisory checksheet.

b. Critique by Instructor (3 minutes).
Note. Repeat *a* and *b* above for each student.

4. REVIEW (5 minutes)

a. Clarification of Students' Questions on Introductions.

b. Summary.
(1) Purposes of introduction.
(2) Techniques.
(3) Content of introduction.

c. Closing Statement. By means of an effective introduction, an instructor sets the stage for his presentation. He does this through making contact with his class, securing their attention, stimulating interest, and disclosing the nature of the subject at hand. By following the techniques that have been demonstrated here today, our oral instruction will be accepted by our students and achieve the results we desire.

INSTRUCTIONAL UNIT: Training Aids.

TYPE: Conference and demonstration.

TIME ALLOTTED: 2 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor and assistant instructor.

TRAINING AIDS: Overhead projector and 5 transparencies. Locally available aids and materials.

REFERENCES: FM 21–6, para 33–38.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (10 minutes)

a. Reasons. Training aids:

(1) Give the instructor valuable assistance in putting his instruction across to the students.
(2) Make learning easier and more interesting to the students by their vivid appeal and emphasis.
(3) Enable the instructor to save valuable training time.
(4) Reinforce learning through their multiple sense appeal.
(5) Are only effective if correct techniques in their use are employed.
(6) Cannot always be obtained from support agencies; therefore, the instructor may have to make them.

b. Objective. Be able to—

(1) Recognize proper techniques in the use of training aids.
(2) List the common-type training aids and their uses.
(3) List materials available for making aids.

2. EXPLANATION AND DEMONSTRATION (70 minutes)

a. Techniques in the Use of Training Aids.

(1) Plan or select appropriate aid.
(*a*) Size of class and classroom.
(*b*) Subject.
(*c*) Class level.
(*d*) Variety, and compatibility with other aids.

(2) Prepare for the use of the aid.

Note. Show transparency 1. (Fig. 40.)

(*a*) Know the aid.
(*b*) Prepare the aid mechanically.

(3) Explain the aid to the class.

Note. Show transparency 2. (Fig. 41.)

(*a*) Orientation of the entire aid.

(*b*) Detailed explanation of point.

(4) Keep aids covered when not in use.

Note. Show transparency 3. (Fig. 42.)

(5) Show aids so that all can see.

Note. Show transparency 4. (Fig. 43.)

(6) Use a pointer.

Note. Show transparency 5. (Fig. 45.)

(*a*) Hold in hand closest to the aid.

(*b*) Will help maintain class contact.

Note. Demonstrate techniques. Call on students to evaluate.

b. Training Aids, Their Purpose and Use.

(1) *Overhead projector.*

(*a*) *Purposes.*

Note. Illustrate with sample slides.

1. Shows list.

2. Portrays ideas graphically.

3. Depicts photographically.

4. Develops ideas through overlays on slide.

5. Shows outline form of small parts.

6. Records student responses.

Note. Demonstrate use of cellophane roll on overhead projector.

(*b*) *Preparations for use.*

Note. Demonstrate techniques where applicable.

1. Rehearse with assistant.

2. Arrange slides in sequence to aid assistant.

3. Check focus and size.

4. Strip the slide, when appropriate.

5. Turn off no more lights than necessary.

***Caution:* Avoid keeping classroom in total darkness.**

Note. Stress the necessity of titles on slides.

(2) *Venetian blind.*

(*a*) *Purposes.*

1. Shows lists.

2. Use in conjunction with other aids.

(*b*) *Use.*

1. Introduce point.

2. Reveal point.

3. Discuss point.

Notes. 1. Particularly important when teaching procedures or steps.
2. Illustrate characteristics with sample Venetian blind strips.

(3) *Chalkboard.*

(*a*) *Purposes.*

1. Portrays development of teaching point.

2. Shows impromptu illustrations.

3. Records student responses in conference.

(*b*) *Use.*

1. Plan work.

2. Check for clean board and presence of chalk and erasers.

3. Keep it simple.
4. Print and draw so that all can see.

Caution: **Appropriate to class.**

5. Use color for emphasis.
6. Label important points.
7. Maintain contact.

Note. Demonstrate improper use of blackboard. Have students critique.

(4) *Training films and film clips.*

(*a*) *Purposes.*

1. Supplement classroom or field demonstrations.
2. Provide a change of pace.

(*b*) *Use.*

1. Preview carefully; study instructor's film reference.
2. Introduce.
3. Show.
4. Apply, test, and summarize.

(5) *Other types of training aids.*

(*a*) Equipment.
(*b*) Models.
(*c*) Displays.
(*d*) Wall charts.
(*e*) Blacklight.
(*f*) Terrain boards.
(*g*) Flock or blanket boards.
(*h*) Trainers.
(*i*) Simulators.

Note. Explain to students the process of local procurement from support agencies.

c. Construction of Training Aids.

Note. Illustrate the following with appropriate aids. Explain techniques of their construction.

(1) *Slides.*

(*a*) Acetate with grease pencil.

Note. Grease pencil will not show color on acetate.

Cautions: **1. Fasten sheets of acetate together before drawing overlay.**
2. Use gridded acetate or sheet of ruled paper as guide when straight lines are desired.

(*b*) Acetate with ink and water color.
(*c*) Cellophane slide.

Note. Use all capitals.

(*d*) Transparencies.
(*e*) Thermo-fax (provides a rapid means of duplicating).

Caution: **Illustration to be duplicated must be fairly large and well-defined.**

1. Forms.
2. Diagrams.
3. Pictures.

(*f*) Overhead projector film (carbon emulsion film).

(2) *Venetian blind strips.*

Note. Stress use of Venetian blind for listing.

(*a*) Freehand use of grease pencil, magic marker, and speedball pen.
Note. Illustrate techniques of making Venetian blinds.
(*b*) Stencils.
(*c*) Lettering guides.

(3) *Cutouts.*

(4) *Charts.*
(*a*) Methods of construction:
1. Opaque projector.
2. Freehand sketching.
3. Block enlargement.
(*b*) Headings and listing of key points.

(5) *Maps.* Must show—
(*a*) Direction.
(*b*) Scale.

(6) *Models.*

3. EXAMINATION AND CRITIQUE (15 minutes)

4. REVIEW (5 minutes)

a. Clarification of Student Questions.

b. Summary.
(1) Techniques in use of slide.
(2) Purposes and uses of common aids.
(3) Construction of aids.

c. Closing Statement. By using good training aids properly you will insure that your instruction is more effective.

INSTRUCTIONAL UNIT: The Demonstration Method.

TYPE: Conference and demonstration.

TIME ALLOTTED: 1 hour.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Overhead projector and 7 transparencies, chalkboard.

REFERENCES: FM 21–6, ch. 8.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Uniform as prescribed, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (5 minutes)

a. Reasons. The Army instructor must frequently show as well as tell. The demonstration is an effective method of instruction if properly planned and presented. Understanding the uses of the demonstration and how to plan and conduct it is an essential requirement.

Note. Emphasize the value of showing by asking a student to tell, without showing, how to smoke a cigarette or put on a coat. Instructor acts out explanation.

b. Objectives. Be able to—

(1) List uses of the demonstration and give examples.
(2) Name forms of the demonstration.
(3) Recognize specific points that should be observed in planning and giving the demonstration.

2. EXPLANATION (42 minutes)

a. Purpose of the Demonstration. The demonstration may be used to teach—

(1) How to do something (learning a skill).
(2) Why it works (principles and theories).
(3) How it works (operations and functioning).
(4) How it is executed (tactical movements).
(5) How men work together (procedures).
(6) Appreciations.

Note. Cite examples of each of the above uses. Call on students for other examples. List on chalkboard or show transparencies 1–6. (Figs. 53–58.)

b. Forms of the Demonstration.

(1) The procedural demonstration.
(2) Displays.
(3) Field demonstrations.

(4) Motion pictures.
(5) The skit or playlet.

Note. Cite examples of demonstrations employing the above forms. Call on students for additional examples. List forms on chalkboard or show transparency 7. (Fig. 59.)

c. Specific Points to Observe in Planning and Conducting Demonstrations.

Note. List on chalkboard.

(1) Plan details carefully.
  (*a*) Arrange tools and equipment.
  (*b*) Arrange students.
  (*c*) Follow a written lesson plan.
  (*d*) Demonstrate one thing at a time.
(2) Be alert to your class.
  (*a*) Maintain proper position.
  (*b*) Talk to the class.
  (*c*) Check frequently to see that students understand.
  (*d*) Encourage students to ask questions.
  (*e*) Use additional aids.
  (*f*) Summarize.
(3) Coordinate explanation and demonstration.
  (*a*) Keep explanations brief and to the point.
  (*b*) Avoid awkward gaps.
  (*c*) Emphasize the essential points.
(4) Emphasize safety precautions.

Note. Present a demonstration. Have students critique.

3. REVIEW (3 minutes)

a. Clarification of Student Questions.

b. Summary.

(1) Purpose of the demonstration.

c. Closing Statement. The demonstration is an effective method of instruction. We show as well as tell whenever possible. To show how to do something by means of a well-planned and well-conducted demonstration is the next best thing to having them do it themselves.

INSTRUCTIONAL UNIT: Questioning Techniques.

TYPE: Conference and practical exercise.

TIME ALLOTTED: 1 hour.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor and assistant.

TRAINING AIDS: Overhead projector and 7 transparencies.

REFERENCES: FM 21–6, ch. 6.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Uniform as prescribed, notebook and pencil, FM 21–6.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

   a. Objective. Be able to—

   (1) Explain the value of the question as an instructional technique.

   (2) Explain characteristics of a good question and give examples.

   (3) Explain correct questioning technique.

   b. Reasons.

   (1) Properly used, the question is an effective means to obtain and sustain active student participation in oral instruction.

   (2) To be a good instructor, you must be able to use proper conference techniques.

2. EXPLANATION (32 minutes)

   a. When to Use Questions.

   (1) Must be used in the conference.

   (2) Should be used in the demonstration.

   (3) Should be used in the practical exercise.

   (4) May be used as a summary device.

   (5) May be used in a discussion after a lecture.

   b. Advantages Gained by Asking Questions.

   (1) Increases student interest.

   (2) Stimulates student thinking.

   (3) Gears instruction to the class.

   (4) Provides opportunity for expression of student attitudes.

   (5) Introduces class experience.

   (6) Provides drill.

   (7) Emphasizes main points of the lesson.

   (8) Checks the effectiveness of the instruction.

   Note. Develop the above points from the class and list them on the chalkboard or show transparency 1 (Fig. 31) in summary.

c. *Questioning Techniques.*

(1) *Characteristics of a good question.* A good question should:

Note. Show transparencies 2–6. (Figs. 32–36.)

(*a*) Have a specific purpose.

1. Have a teaching purpose: check, drill, development, problem solving, etc.

EXAMPLE: As a check on a study assignment for this unit, one might ask, "What is one advantage of asking questions?"

2. Base questions on significant teaching points.

(*b*) Be understood by students.

1. Alert students that question is being asked.

2. Word in simple language.

(*c*) Emphasize one point.

1. Divide questions requiring a serial response into individual questions.

WRONG EXAMPLE: What are the advantages and disadvantages of the combat formations used by the tank platoon?

Note. The following example could be used during an initial discussion of combat formations.

EXAMPLE: What is one advantage of the column formation used by the tank platoon?

Note. The following examples might be used if the purpose of the question is recall in the summary.

EXAMPLES: 1. What are the advantages of the column formation used by the tank platoon?

2. What are the disadvantages of the column formation used by the tank platoon?

2. Keep responses related to main points. Use listings and summaries.

(*d*) Require definite answers.

1. Phrase questions that must be answered specifically.

2. Do not allow students to bluff.

EXAMPLE: What should a good tank commander do whenever possible?

DEFINITE EXAMPLE: What are the duties of the tank commander concerning operator/crew maintenance?

(*e*) Discourage guessing.

1. Ask questions the answers to which will indicate student knowledge.

2. Do not ask "yes" or "no" questions unless the students are required to explain the answers.

3. Do not ask questions that suggest the answer.

EMPHASIZE: To insure good questions, write them into the lesson plan.

(2) *Technique for asking questions.*

Note. Use transparency 7. (Fig. 37.)

(*a*) State the question.

(*b*) Pause.

(*c*) Call on the student by rank and name.

QUESTION: In what order should you call on members of the class?

1. Ask questions in no set pattern.
2. Call on as many students as practicable.

QUESTION: What requirement will you place on your students when they answer a question?

ANSWER: That each student stand, announce his name, and answer so that he can be heard by all.

QUESTION: What technique do you use for the student who answers "I don't know"?

ANSWER: Try to rephrase question and draw out the answer.

QUESTION: How do you handle the student whose answer is only partially correct?

ANSWER: Rephrase question or use other students to provide assistance.

QUESTION: What technique do you use for the indifferent student who answers "I don't know"?

ANSWER: Ask him several questions. Make clear that indifference will not be condoned.

(*d*) Evaluate the answer.

Notes. 1. Explain difference between recognition and evaluation.
2. Explain need for playing student answers to problem-type questions.

3. APPLICATION (12 minutes)

a. Directions to Students.

(1) You will be given several questions.
(2) You are to evaluate the questions in terms of characteristics of a good question and technique for asking a question.

b. Questions.

QUESTION 1: Would good control of the column formation be an advantage—Sgt_____? (Yes or no type question.)

QUESTION 2: The column formation has poor firepower to the front and rear. Is this a disadvantage of the column formation—Sgt _____? (Answer suggested in stem.)

QUESTION 3: Do you have any questions? (OK, we have discussed several areas and desire to clear up difficulties.)

QUESTION 4: Sgt _____, what is one reason why this is an important advantage? (Wrong technique for asking question.)

QUESTION 5: What is the most important advantage of a formation—Sgt _____? (Vague—no definite answer.)

QUESTION 6: What are the three formations we have discussed so far and what are the advantages and disadvantages of each formation—Pvt _____? (Multibarrel—this question is too broad.)

QUESTION 7: Cpl _____, what about these tank formations? (Wrong technique and question has no definite answer.)

QUESTION 8: Which of the tank formations gives the platoon the best all-round security—Sgt _____? (OK.)

QUESTION 9: Would you use the line formation or the *column formation* when making an approach march—Sgt _____?

Note. Stress column formation.

(Guessing-type question; answer suggested.)

4. REVIEW (3 minutes)

a. Clarification of Student Questions.

b. Summary.

(1) When the question is used.
(2) Advantages of the question.
(3) Characteristics of a good question.
(4) How to ask a question.

c. Closing Statement. Plan your questions carefully; write them in your lesson plan; ask them properly, and you will keep your students interested.

INSTRUCTIONAL UNIT: Chalkboard Presentations.

TYPE: Practical exercise.

TIME ALLOTED: 6 hours. (Based on 48 students divided into 3 sections of 16 students each; 3 students present per hour.)

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: Student critique sheets, supervisory checksheets.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Chalkboard.

REFERENCES: FM 21-6, para 37.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

   a. Reasons.

   (1) Chalkboard is widely used.
   (2) Has variety of uses in classroom and field.
   (3) Many times the chalkboard is the only aid available. As an instructor, you must be able to use this aid effectively.

   b. Objective. Be able to employ proper—

   (1) Techniques and skills in use of the chalkboard.
   (2) Speech and oral presentation techniques.

2. EXPLANATION (5 minutes)

   a. Points To Be Observed.

   (1) Legibility, neatness, and uniformity of printing and drawings.
   (2) Contact with class.
   (3) Originality.
   (4) Development of graphic illustrations.
   (5) Variety of uses:
      (*a*) Topics.
      (*b*) Sketches.
      (*c*) Diagrams.
      (*d*) Questions.
      (*e*) Recording student responses.
      (*f*) Listings.

   b. Administrative Information and Instructions.

   (1) Presentation to be graded.
   (2) Deviation of 2 minutes in timing allowed.
   (3) Must be a complete lesson.

c. *Procedure To Be Followed.*

(1) Final check of setup by student.
(2) Chalkboard presentation by student.
(3) Setup by next student.
(4) Critique by instructor and students.
(5) Break after three presentations and critiques.

3. APPLICATION (287 minutes)

a. *Presentation of Lesson by Student* (10 minutes).

(1) Class observes and makes notes for critique comments.
(2) Instructor evaluates presentation, using supervisory checksheet.

b. *Critique by Instructor* (3 minutes).

Notes. 1. Next student checks setup for his presentation.
2. Repeat above sequence for total of three presentations and critiques before authorized break.

4. REVIEW (5 minutes)

a. *Clarification of Student Questions.*

b. *Summary*

(1) Uses of the chalkboard.
(2) Legibility and neatness.
(3) Speech techniques.
(4) Techniques of presenting oral instruction.

c. *Closing Statement.* The chalkboard presentations you have seen today have demonstrated several ways in which this aid assists in student learning. With application of originality, practice, and proper techniques, the chalkboard becomes a most reliable and flexible training aid.

INSTRUCTIONAL UNIT: Application.

TYPE: Conference and demonstration.

TIME ALLOTTED: 2 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Overhead projector and 7 transparencies, chalkboard.

REFERENCES: FM 21–6, ch. 9.

STUDY ASSIGNMENTS: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Uniform as prescribed, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

a. Reasons.

(1) Military training emphasizes *doing*.
(2) The Army instructor must be able to train men to *do*.
(3) In actual practice, a great deal of the instructor's time is spent in supervising the development of skill and techniques in students.

Note. Show transparency 1. (Fig. 60.)

b. Objectives and Standards. Be able to explain—

(1) How a student acquires a skill.
(2) The steps of problem solving.
(3) The methods of applicatory training.
(4) How to conduct practical work.
(5) How to plan and conduct a problem exercise.

2. EXPLANATION (77 minutes)

a. How Skills Are Learned.

Note. Show transparency 2. (Fig. 61.)

(1) Gain a concept of the skill.
(2) Practice to develop correct form.
(3) Practice for accuracy and speed.

b. How Problems Are Solved.

Note. List on chalkboard.

(1) Recognize the problem.
(2) Assemble data bearing on the problem.
(3) Suggest solutions.
(4) Evaluate the possible solutions.
(5) Accept the best solution as the course of action.

c. Methods of Application.

(1) *Controlled practice.*

Note. Show transparency 3. (Fig. 62.)

(*a*) Generally the first method.

(*b*) Step-by-step, by-the-numbers process, consisting of—

1. Explanation and demonstration.

2. Imitation by the student.

3. On-the-spot correction of errors.

(*c*) Careful control and supervision must be exercised.

(2) *Independent practice.*

Note. Show transparency 4. (Fig. 63.)

(*a*) More advanced method, affords practice to perfect and make automatic.

(*b*) Students work at their own rate to increase speed and accuracy.

(*c*) Progressive standards and gradual introduction of realism are important.

(*d*) Supervision is important.

(3) *Coach and pupil.*

Note. Show transparency 5. (Fig. 64.)

(*a*) Students must be able to recognize correct performance.

(*b*) Students learn to observe critically.

(*c*) Instructor must supervise closely.

(4) *Team practice.*

(*a*) *First phase.*

Note. Show transparency 6. (Fig. 65.)

1. Serves same purpose for team training as controlled practice serves for individual training.

2. Provides controlled walk-through.

3. Requires supervision.

(*b*) *Tactical phase.*

1. Generally last method used in applicatory training.

2. Realism is essential.

3. Requires careful control and supervision.

4. Must be critiqued.

d. General Considerations for Practical Exercises.

Note. Show transparency 7. (Fig. 66.)

(1) Students must be motivated to learn.

(2) Be sure that practice leads to skill improvement.

(3) Keep achievement standards progressive.

(4) Keep conditions realistic.

(5) Procedures and skills should be applied as taught.

(6) Indirect assistance is best.

(7) Each step must be learned before moving to the next.

(8) Constant supervision is imperative.

Note. A short demonstration lesson will be conducted in which selected students will be guided through a controlled practice applicatory lesson on an item of equipment. The balance of students will observe, take notes, and be prepared to participate in a critique following the lesson. Violations of correct techniques in conduct of applicatory teaching may be interjected by the instructor, for teaching purposes.

e. The Problem Exercise.

(1) *Preparation of the exercise.*

(*a*) Problem exercise consists of requirements and situations.

1. Requirements should be prepared first. Relate requirements to

lesson objectives and cause students to apply the teaching points previously presented.

2. Situations should emphasize considerations of factors necessary to solve the requirements. State situations clearly, simply, and realistically. Provide a challenge to students. Do no include unnecessary information.

(*b*) Solution should provide for a discussion for all reasonable solutions. Explain why the preferred solution was selected.

(2) *Conduct of a problem exercise.*

Note. List on chalkboard.

(*a*) Present the situation and the requirement.
(*b*) Students solve requirements.
(*c*) Students present solutions.
(*d*) Discuss student solutions.
(*e*) Present an approved solution.

3. EXAMINATION (15 minutes)

4. REVIEW (5 minutes)

a. Clarification of Questions.

b. Summary.

(1) How skills are learned.
(2) How problems are solved.
(3) Methods of application.
(4) General considerations for practical exercise.
(5) The problem exercise.

c. Closing Statement. The application of a military skill cannot be left to chance. We learn by doing only if it is accompanied by intelligent guidance and progressive learning. It is in the application stage that skills used in combat are perfected.

INSTRUCTIONAL UNIT: Evaluation.

TYPE: Conference.

TIME ALLOTTED: 2 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: One copy of FM 21–6 for each student.

PERSONNEL: Instructor, assistant instructor.

TRAINING AIDS: Overhead projector and 2 transparencies.

REFERENCES: FM 21–6, para 67–77.

STUDY ASSIGNMENTS: FM 21–6, para 67–69, 75–76.

STUDENT UNIFORM AND EQUIPMENT: As prescribed by training schedules.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (10 minutes)

a. Reasons.

(1) As instructors, you have the responsibility of constructing and administering tests that adequately cover the material you have taught.

(2) Good tests, administered properly, accomplish the following:

(*a*) Aid in improving instruction by—

1. Revealing gaps in student learning.

2. Aiding learning; students tend to remember points covered in an examination.

3. Affording a means of evaluating instructional techniques.

(*b*) Provide an incentive.

(*c*) Provide a basis for assigning grades.

(*d*) Furnish a basis for selection and guidance.

b. Objective. To be able to—

(1) Describe the various forms of tests and explain the use and advantages of each.

(2) Explain how to administer tests.

2. EXPLANATION (85 minutes)

(1) *Oral.*

(*a*) *Uses.*

1. Used primarily as a spot check on student understanding following the explanation of major teaching points, during and after demonstrations, and practical exercises after training films, and in final summary.

2. Questions should be written into the lesson plan.

3. Proper questioning technique should be used.

(*b*) *Advantages.*

1. Flexible. Instructor may rephrase as necessary to find out how much the student knows.

2. Timely. Enables instructor to pace instruction to needs of students.

(*c*) *Limitations.*

1. Time-consuming.

2. Can only provide a limited sampling.

(2) *Written.*

(*a*) *Use.* Measures students' ability to recall essential information and to perform mental skills and abilities that can be expressed in writing.

(*b*) *Advantages.*

1. Easy to administer.

2. Provides a wide sampling.

3. Requires only limited time and material.

(*c*) *Limitations.*

1. Cannot measure physical skills.

2. Not adequate for students with low verbal ability.

(*d*) *Types.*

Note. Show examples of each type. (See FM 21–6, para 72.)

1. Multiple choice (best answer).

2. True-false.

3. Matching.

4. Completion.

5. Listing.

6. Essay.

(3) *Performance.*

(*a*) *Use.* To measure skill in performing a physical task.

(*b*) *Format.* Consists of—

1. Administrative instructions.

2. Checklist.

Note. Show examples. Explain that the performance test is a formal, controlled test. Refer students to sample "county fair" performance tests, fig. 81.

(*c*) Advantages.

1. Most direct means of determining if a man can do a job.

2. It measures specific abilities.

(a) Handling tools efficiently.

(b) Observing safety precautions.

(c) Following correct order of operations.

(*d*) *Disadvantages.*

1. Difficult to set up.

2. Hard to administer.

3. Requires much instructor time, equipment, and facilities.

(*e*) *Construction.*

1. Decide what should be measured by performance.

2. Determine if necessary tools and equipment are available.

3. Prepare administrative instructions.

4. Prepare a checklist.

5. Train instructors in the use of the checklist.

6. Dry run the test and checklist.

QUESTION: What is the most efficient method of insuring that men being tested by performance-type tests are judged by the same standards?

ANSWER: Use a checklist and train the testers in its use.

(4) *Observation.*

Note. Show example. (See annex A.) Explain that this is used to measure day-to-day performance in a normal situation. It is not a formal situation. Students do not know at any given time that they are being tested.

(*a*) Used to measure intangibles such as leadership, work habits, and attitudes.

(*b*) To insure reliable ratings:

Note. Show transparency 1. (Fig. 82.)

1. Know what you are looking for.

2. Observe only situations that indicate the abilities being looked for.

3. Make comprehensive observation.

4. Know what standards are acceptable.

5. Make observations accurate and impartial.

6. Record the results of your observation while they are still fresh in your mind.

7. Have more than one observer.

8. Use a checksheet.

b. Administering Tests.

Notes. 1. Conduct a skit demonstrating the wrong way to administer a test. Issue the wrong test; do not have enough copies for students; have instructor and his assistant carry on a conversation, thus disturbing the class; time the test incorrectly; do not give sufficient time to finish; give student a poor start by explaining how *very* difficult the test is; do not give student time to read the directions; give directions for student before issuing tests.

2. Critique test; bring out the following points. List on chalkboard or use transparency 2. (Fig. 84.)

(1) Have all testing materials ready.

(2) Train the assistants needed.

(*a*) Instructors should make a workable schedule for assistants to follow in—

1. Distributing and collecting test materials.

2. Seating and dismissing the students.

(*b*) Instructors should carefully go over the test with assistants and indicate to them:

1. The points at which they may expect students to have difficulty.

2. The amount and kind of help they may give students.

3. Their exact function and location in the testing area.

(3) Provide the best possible testing conditions.

(*a*) Eliminate all interest-destroying factors.

(*b*) Place seats so that each man will have ample working space.

(*c*) If possible, give tests when the men are mentally and physically rested.

(4) Give students a good start.

(*a*) Make sure that the test directions are understood.

(*b*) Tell the students the kind of help they can get and the materials that are to be used.

(*c*) Tell the students what the time limit is.

(5) Conduct the test carefully.
(*a*) Maintain order.
(*b*) Be sure test is timed accurately.
(6) Conduct a critique of every test.

3. REVIEW (5 minutes)

a. Clarification of Student Questions.

b. Summary.
(1) Forms of test.
(2) Administration of tests.

c. Closing Statement. Tests are essential to good training. A continuous check on student progress and the effectiveness of instruction is the responsibility of every instructor.

Annex A—Observation Rating Scale.

EVALUATION

Annex A to Lesson Plan

OBSERVATION RATING SCALE

NAME_____ CLASS NO. _____

DIRECTIONS TO THE INSTRUCTOR. As you complete this evaluation sheet, you are to visualize yourself in combat in the role of a maintenance sergeant, with this student as one of your mechanics.

How would you rate him in the following items?	POOR cannot do job	FAIR needs much help	GOOD needs little help	BEST needs no help	INSTRUCTOR'S NOTES
1. Inspection.	0	1 2 3	4 5 6	7 8 9	
2. Removal and installation of the power plant.	0	1 2 3	4 5 6	7 8 9	
3. Performance of power train services.	0	1 2 3	4 5 6	7 8 9	
4. Performance of track and suspension maintenance.	0	1 2 3	4 5 6	7 8 9	
5. Lubrication of the vehicle.	0	1 2 3	4 5 6	7 8 9	
6. Recognizing and diagnosing deficiencies.	0	1 2 3	4 5 6	7 8 9	
7. Correcting deficiencies.	0	1 2 3	4 5 6	7 8 9	
8. Practicing safety.	0	1 2 3	4 5 6	7 8 9	
9. Use of tools and publications.	0	1 2 3	4 5 6	7 8 9	
10. Following instructions.	0	1 2 3	4 5 6	7 8 9	

INSTRUCTOR_____. TOTAL SCORE_____

Student ranks _____ in group of _____.

INSTRUCTIONAL UNIT: Planning the Lesson.

TYPE: Conference and practical exercise.

TIME ALLOTTED: 4 hours.

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: None.

PERSONNEL: Instructor, one assistant instructor.

TRAINING AIDS: Chalkboard, overhead projector and transparency.

REFERENCES: FM 21–6, para 60–66.

STUDY ASSIGNMENT: Same as references.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil, and references for "short lesson" subject.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (3 minutes)

a. Reason. The key to good instruction is thorough preparation. Each hour you spend in the classroom will require of you several hours of studying, writing plans, devising aids, and rehearsing. You will seldom have all the time you would like for this task. You will learn in this period how to make the most of the time you do have for planning. You are required to write lesson plans for both the "Short Lesson" and "Long Lesson" presentations. You will have the opportunity during this period of instruction to develop the plan for your short lesson.

b. Objectives. Be able to—

(1) List the lesson objectives for your short presentation.
(2) Explain how you will teach your lesson in regard to subject matter content, organization, and methods and techniques.
(3) Make a lesson plan to support your short presentation.

2. EXPLANATION AND PRACTICAL EXERCISE (195 minutes)

a. Determine Lesson Objectives. Make sure that they are—

Notes. 1. Define lesson objectives as duty-oriented learning outcomes. Give examples.
2. Stress that lesson objectives must be used by the instructor to guide him in determining what subject matter to teach.
3. List the characteristics below on chalkboard.

(1) Attainable.
(2) Behavioristic.
(3) Specific.
(*a*) Conditions stated.
(*b*) Standards included.

Notes. 1. Have students write their lesson objectives for their short presentations (15 minutes).
2. Call on selected students to state their lesson objectives.

3. Critique lesson objectives in terms of criteria listed above (20 minutes).

b. Determine Subject Matter To Be Taught.

(1) Analyze each lesson objective by dividing it into major instructional steps.

Note. Caution instructors not to overlook important steps. Such omission often leads to student difficulty in learning.

(2) Determine what skills or knowledge the student must have to accomplish each step.

(*a*) Facts.
(*b*) Principles.
(*c*) Procedures.
(*d*) Examples.
(*e*) Comparisons.
(*f*) Illustrations.

Notes. 1. Stress the need for examples, comparisons, and illustrations in vitalizing instruction.
2. Have students analyze one of their lesson objectives into its major instructional steps (15 minutes).
3. Critique selected student solutions (10 minutes).
4. Have students support one of their major instructional steps (15 minutes).
5. Critique selected student solutions (10 minutes).

c. Determine Organization of Lesson.

Note. List on chalkboard.

(1) Chronological—order of time.

EXAMPLE: In teaching a lesson on combat intelligence, you would teach first the collection of information, then the processing of information, and finally the dissemination and use of intelligence and information. This sequence is desirable because it follows in order of time the way the procedure operates.

(2) Spatial—order of relation of one element to another.

EXAMPLE: In teaching a lesson on the nomenclature and function of the track and suspension system of a tracked vehicle you would explain the parts in order from front to rear. For other lessons, the sequence may be from top to bottom, bottom to top, or rear to front.

(3) Whole to part.

(*a*) Give brief, overall explanation of entire function, operation, or procedure.
(*b*) Then give a more detailed explanation of the specific portion of the function, operation, or procedure.

EXAMPLE: In teaching the cooling system of a truck engine, you would first give a brief overview of all the systems to show their relation to the cooling system. Then you would explain, in detail, the cooling system.

(4) Simple to complex or known to unknown.

(*a*) Start with material familiar to students.
(*b*) Explain new material progressively.

EXAMPLE: In teaching a lesson on topographic symbols (mapreading), you may start by illustrating symbols that look like the actual objects they represent (stream, road, or building). Then proceed to illustrate symbols that the student would have to memorize the meaning of in order to identify them (water mill, shrine, bench mark).

Notes. 1. Stress that the above systems are the most common; other systems may be used, depending on the subject matter.
2. Lessons may require the combination of systems; for example, the use of whole-part with spatial.
3. Have the students list the sequence of presentation of their subject matter (15 minutes).
4. Critique student solutions (15 minutes).

d. Determine Methods and Techniques. Apply the following guiding principles.

Note. Show transparency of principles below.

(1) Present material in small, cohesive segments.
(2) Require maximum student participation in each segment.
(3) Present material in logical sequence.
(4) Design practical work to insure successful response.
(5) Correct errors on the spot.
(6) Select methods that give the instructor maximum control of student learning.

e. Make a Lesson Plan.

(1) *Content.*
(*a*) Heading.
(*b*) Outline of main points of subject matter supported by:
1. Appropriate subpoints.
2. Illustrative material.
(*c*) Indication of instructor and student activities.

(2) *Use.*
(*a*) As a basis for making notes.
(*b*) As a guide.

(3) *Types.*
(*a*) Topical plan.
(*b*) Sentence plan.
(*c*) Paragraph plan.

(4) *Format.*
(*a*) The organization of a lesson is reflected in the major divisions of the lesson plan.
(*b*) The major divisions are the major instructional activities.
(*c*) These major instructional activities should be indicated in the same sequence in which the lesson is to be taught.

Note. Outline examples on chalkboard.

EXAMPLES: If the instructor plans first to introduce the lesson, then to explain the main ideas, and lastly to summarize these ideas, he should outline his lesson plan as follows:
1. INTRODUCTION.

2. EXPLANATION.
3. REVIEW.

When the instructor desires to follow his explanation with a practical exercise, which he will critique as the exercise progress, he should outline the major instructional activities (major divisions of the lesson plan) as follows:

1. INTRODUCTION.
2. EXPLANATION.
3. PRACTICAL EXERCISE.
4. REVIEW.

(*d*) The determination of the major divisions of a lesson plan is flexible.

(*e*) The instructor should plan how he is going to teach each lesson and then make the major divisions of his lesson plan reflect that sequence.

(*f*) After determining the major divisions, the instructor should develop each major division to reflect in detail.

1. Outline of subject matter. Indicate the main subject points and subpoints.

2. Methods of instruction and time.

EXAMPLE:

1. INTRODUCTION (Conference—3 minutes).
2. EXPLANATION, DEMONSTRATION, AND PRACTICAL WORK (Controlled Practice—47 minutes).
3. APPLICATION (Independent Practice—45 minutes).
4. REVIEW (Conference—5 minutes).

3. Instructional procedures. The instructor should indicate where he intends to use instructional procedures by the use of such terms as: NOTE, EXAMPLE, SUMMARIZE, CAUTION, QUESTION, TRANSITION.

(5) *Outlining.*

(*a*) *What to designate.*

1. Major divisions or major instructional activities.
2. Main points of subject matter.
3. Supporting points of subject matter.

(*b*) *How to designate.*

1. Use only Arabic numerals and lower case letters.
Note. Develop outline on chalkboard.
2. Avoid designating, by number or letter, instructional procedures.
3. Avoid dividing a topic into less than two headings.
Notes. 1. Have students begin working on their lesson plans (20 minutes).
2. Supervise by circulating through the room and giving individual advice.

3. REVIEW (2 minutes)

a. Clarification of Student Questions.

b. Summary. Prepare for instruction by—

(1) Determining lesson objectives.
(2) Determining subject matter to be taught.
(3) Determining lesson organization.
(4) Determining methods and techniques.
(5) Making a lesson plan.

c. Closing Statement. You have learned a systematic approach to planning a lesson. To insure effective presentation, you need to rehearse the plan.

INSTRUCTIONAL UNIT: Short Lesson Presentation.

TYPE: Practical exercise.

TIME ALLOTTED: 8 hours. (Based on 48 students divided into 3 sections of 16 students each; 2 students present each hour.)

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: Student critique sheets, supervisory checksheets.

PERSONNEL: Instructor.

TRAINING AIDS: Student-made aids.

REFERENCES: FM 21–6.

STUDY ASSIGNMENTS: Same as reference.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None.

1. INTRODUCTION (5 minutes)

a. Reasons.

(1) As instructors, all of us need to improve.

(2) Student presentations can provide for improvement.

(*a*) Opportunity to observe other instructors.

(*b*) Help of associates in identifying weaknesses and strongpoints.

(3) Student presentations are means of preparation for long lesson presentations that follow.

b. Objective. Be able to—

(1) Plan a lesson.

(2) Present a lesson.

(3) Evaluate instruction.

2. EXPLANATION (10 minutes)

a. Procedure To Be Followed.

(1) Setup by student.

(2) Presentation by student, turn-in of lesson plan.

(3) Critique by student critic.

(4) Resident instructor's critique.

(5) Setup by next student.

b. Administrative Information and Instructions.

(1) Presentation to be graded.

(2) Deviation of 2 minutes in timing allowed.

(3) Must be a complete lesson.

(*a*) Oral instruction must include introduction, explanation, and summary.

(*b*) Supported by student-made training aids.

(4) Student critique to be graded.
(5) Lesson plan to be graded.

c. Conduct of Student Critique.

Note. Explain guide for evaluating instruction and use of critique sheet. Assign student critics.

(1) Restate objective of lesson.
(2) Review procedure used.
(3) Evaluate the presentation.
(4) Conduct group discussion.
(5) Summarize.

3. APPLICATION (370 minutes)

a. Student presents lesson (15 minutes per student).

(1) Class observes and makes notes on student critique sheets.
(2) Instructor evaluates presentation on supervisory checksheet.
(3) Students turn in lesson plan on completion.

b. Student critic presents critique (5 minutes per student).

(1) Follows format as outlined on critique sheet.
(2) Class discusses presentation and makes suggestions for improvement.

c. Resident instructor evaluates presentation and student critique (5 minutes per student presentation).

4. REVIEW (15 minutes)

a. Clarification of Student Questions.

b. Summary.

(1) Necessity of proper planning.
(2) Practice in oral presentation.
(3) Exercise in evaluating other presentations.

Note. Stress importance of above with reference to long lesson.

c. Closing Statement. Avoid the errors you have seen here today and adhere to the proven techniques of instruction demonstrated in these presentations. This will help you in the presentation of your long lesson and in all of your future instruction.

INSTRUCTIONAL UNIT: Long Lesson Presentation.

TYPE: Practical exercise.

TIME ALLOTTED: 16 hours. (Based on 48 students divided into 3 sections of 16 students each; 1 hour allocated for each student presentation, including critique.)

CLASSES PRESENTED TO:

TOOLS, EQUIPMENT, AND MATERIALS: Student critique sheets, supervisory checksheets.

PERSONNEL: Instructor.

TRAINING AIDS: Student-made or procured aids.

REFERENCES: FM 21–6.

STUDY ASSIGNMENT: Same as reference.

STUDENT UNIFORM AND EQUIPMENT: Duty uniform, notebook and pencil.

TROOP REQUIREMENTS: None.

TRANSPORTATION REQUIREMENTS: None

1. INTRODUCTION (5 minutes)

   a. Reasons.

   (1) Need for improvement.

   (2) Long lesson presentations assist in two ways.

   (*a*) Opportunity to observe other instructors.

   (*b*) Help of associates in identifying weaknesses and strengths.

   (3) As supervisors, we must know what makes good instruction.

   b. Objective. Be able to—

   (1) Plan and teach a complete lesson.

   (2) Conduct a formal critique.

2. EXPLANATION (10 minutes)

   a. Administrative Instructions.

   (1) Presentation to be graded.

   (2) Deviation of 2 minutes in timing allowed.

   (3) Must be a complete lesson supported by appropriate aids.

   (4) Student critique to be graded.

   (5) Lesson plan to be graded.

   b. Conduct of Student Critique.

   Note. Review use of critique sheet and guide. Assign critics.

   c. Procedure To Be Followed.

   (1) Setup by student.

   (2) Presentation by student, turn-in of lesson plan.

   (3) Critique by student critic.

(4) Resident instructor's critique.
(5) Preparation of setup by next student during break.

3. APPLICATION (770 minutes)

a. Student presents lesson (35 minutes).
(1) Class observes and makes notes, using student critique sheets.
(2) Instructor evaluates presentation, using supervisory checksheets.
(3) Student turns in lesson plan upon completion of lesson.

b. Student critic presents critique (5 minutes).

c. Resident instructor evaluates presentation and critique (10 minutes).
Note. **Break after above sequence.**

4. REVIEW (15 minutes)

a. Clarification of Student Questions.

b. Summary.
Note. **Emphasize major points brought out in critiques.**

c. Closing Statement. As supervisors, we must not only know what makes good instruction, but we must also be skilled in evaluating and in suggesting ways of improvement. As instructors, all of us can improve our instruction by planning, rehearsing, and observing others. Your accomplishments in these presentations, and your recognition of the errors made, can assist you in becoming better instructors and supervisors.

APPENDIX C

STUDENT CRITIQUE SHEET

INSTRUCTOR _____

SUBJECT _____

ELEMENTS TO BE OBSERVED _____ COMMENTS _____

INTRODUCTION

Were lesson objectives clearly stated?
Were reasons adequately stated?
Did the instructor establish contact?

PRESENTATION

Was the material well organized?
Were the main points emphasized?
Were demonstrations effective?
Were transitions used effectively?

INSTRUCTOR QUALITIES AND SPEECH TECHNIQUES

Did the instructor possess poise and confidence?
Did he possess military bearing?
Was he forceful and enthusiastic in his delivery?
Did the instructor maintain contact?
Were any distracting mannerisms present?
Did the instructor express ideas clearly and fluently?

TRAINING AIDS

Were the aids adequate?
Were they used correctly?
Did the assistant instructor perform adequately?

STUDENT PARTICIPATION

Did instructor plan student participation properly?
Were conference techniques employed properly?
Was student attention and interest evident?

PREPARATION

Was there evidence of careful planning?
Did the instructor give evidence of preparation?
Was the best use made of time available?

_____
Critic

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INDEX

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Official:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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