
Civilian Conservation Corps

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Vocational Series

A MANUAL

FOR INSTRUCTORS IN CIVILIAN CONSERVATION
CORPS CAMPS

Prepared by the Vocational Division

United States Office of Education

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Department of the Interior

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THIS manual which was prepared by the Vocational Division, United States Office of Education, Department of the Interior, and approved by the director, Emergency Conservation Work, is published for use in connection with the educational program of the Civilian Conservation Corps.

By order of the Secretary of War:

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General,
Chief of Staff.

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Brigadier General,
Acting The Adjutant General.

Foreword

THE manuscript of this *Manual for Instructors in Civilian Conservation Corps Camps* was prepared by M. Reed Bass, chairman of a committee responsible for preparing *Outlines of Instruction* to be used in the Civilian Conservation Corps educational program. The members of the committee, brought together in the United States Office of Education, were:

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The *Manual for Instructors* is intended for use with the *Outlines of Instruction* in the Civilian Conservation Corps educational program, and has been prepared specifically to meet the needs and working conditions under which this program is being conducted.

J. C. WRIGHT,
Assistant Commissioner for Vocational Education.

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Chapter 1 ★ Learning and Teaching

LEARNING is using the mind. We learn when we acquire an ability, a new idea, an experience, or something new—as in learning how to do a card trick, how to tie a knot in a rope, how a new kind of steel is made, or how to operate a new machine or device. All minds do not work alike. A salesman's mind works to guide the thinking of other people so that they will purchase his product; a lawyer endeavors to sway the opinions of a jury; a minister tries to influence his congregation. Each is attempting to sell himself or the idea he is talking about, but each is approaching his problem from a different angle.

Learning usually goes on continually after the new idea or ability is once acquired. If we continue to practice the idea or technique, we finally fix it and it becomes a habit. Learning is something we have to do ourselves. Others cannot do it for us. We seldom learn to do a thing by simply watching others do it. We ourselves must think about and do the thing we want to learn, if we are to acquire the ability to do it. As has been stated many times: "You cannot teach anybody anything; you can only help the learner to teach himself."

Some minds work very slowly, others very rapidly. Some respond to one stimulus, while others react to an entirely different one.

No attempt will be made here to discuss the psychology of learning or why minds work as they do. However, the instructor should understand that the mind works through three common stages—*stimulus*, *thinking*, and *action*. The mind is aroused or stimulated, we think, and then we act. A man may insult another. The man insulted thinks about how he has been insulted, and may strike the man who did

it. His mind goes through three stages: *Stimulation*—he is offended; *thinking*—he becomes angry; *action*—he strikes.

When teaching, the instructor must take into consideration the fact that all minds do not work alike, and must use methods and devices which will develop the thinking and guide the learning of each member of the class. Chapter 3 on Methods and Devices describes ways to develop interest and guide the thinking of the learners.

In general, people develop or learn two kinds of skills—bodily skills and mind skills. Bodily skills are those acquired in using the body or muscles. Mind skills are those acquired in using the mind—in thinking about what we do. These skills are nothing more than fixed habits. Very few habits are formed without definite thinking. In teaching we work with the mind because the mind governs the hand.

The following are rough, but fairly accurate statements of laws or ways in which human beings establish associations or bonds, and finally semiautomatic or automatic habits in using their minds or muscles.

The mind is a neural switchboard. Through experiences it sets up its own associations of ideas and actions. By practice and association a bond may be set up; and through further repetition, it may be developed into a neural pattern and finally into a fixed habit. A habit can be developed only by repetition and practice. The effective way to develop a habit or skill in doing or thinking is to practice it correctly from the start. Until it has become fully established it should always be practiced in the same way. We carry from one experience in learning to another only the associations, bonds, or habits that we have developed in connection with the first or previous experiences. A habit should be practiced under the conditions under which it is to function, and against some standard set-up for evaluating progress. It should be practiced until it has become fully established. It is best developed under actual working conditions. It may wane from disuse. A few habits of muscular type, such as swimming, wane slowly and are easily relearned. It is easier to revive a habit which has waned than it was to

learn it in the first place. The best way to break a bad habit is to practice a correct one in its place.

In the development of a habit or skill the learner does not steadily progress, but moves forward by alternate periods of improvement and apparent stagnation through what are sometimes called "plateaus of learning." A habit is learned most effectively when it is practiced under the direction of an instructor who is himself a master of it. Just as efficient habits in doing physical work may be developed, so may efficient habits of using the mind in thinking be developed. They are developed more quickly and easily by a student who is interested in learning. One way to become resourceful in the use of any habit, whether it be in the performance of physical work or in thinking, is to practice it under a wide variety of situations. The measure of any habit or skill, in thinking or doing, is performance, which tests ability to use it effectively.

Teaching is the process of controlling, directing, or managing the thinking of the student so that he will be able to do and to understand the thing which you plan to teach him.

In teaching occupational subjects, instructors are prone to think in terms of their own rather than of their students' experiences and backgrounds. If they have been occupationally trained, they will very likely teach jobs in the sequence in which they are performed in practice. This is not always the logical order of learning. Too often in practice the most difficult step must be performed first, while the least complex step may be done last. In teaching, this order should be reversed or rearranged to provide a sound training sequence.

No two teaching situations are absolutely identical. There may be several ways of presenting instructional material, but if an instructor knows all the factors to be considered, he can usually plan to use a method of presentation which will be better than any other. The instructor is a manager securing good or bad results in the terms of his skill in selecting devices to overcome learning difficulties or situations. Learning is a process largely hidden from the teacher, but

he can determine the extent to which his students are actually learning by observing their reactions to methods selected and initiated by him.

Any tradesman who decides to enter the teaching profession should realize that he must know two trades in order to be successful—the job trade and the teaching trade. He may be an experienced worker, knowing practically everything about his job trade, but if he cannot present information about that trade intelligently to someone else, he cannot be an efficient instructor. A man who has given only a limited amount of thought to teaching may think that he has fulfilled his responsibility and that he had done a good job of teaching when he tells a student how to do a job or presents certain facts; but telling is not teaching. Other sections of this manual discuss methods of teaching which will be helpful to any man who is interested in taking up teaching either as an occupation or for incidental use in connection with his work. By instructing others a man broadens his own outlook, and invariably becomes a more skilled and better informed tradesman. It is a false notion that instructors are born. Instructing skill is acquired, just as the skill of a job trade is acquired. Efficiency comes through study, purposeful effort, and continued practice.

Chapter 2 ★ Responsibilities of Camp Instructors

EVERY job, of whatever nature, involves definite responsibilities and duties. The job of teaching in a Civilian Conservation Corps Camp is no exception. No man can serve a job well unless he knows and understands the responsibilities attached to that job.

In this chapter are listed the particular responsibilities which instructors teaching in C. C. C. camps must assume. These responsibilities appear to be rather extensive. They are, however, merely enumerated for the purpose of making clear what the instructor is expected to do. No attempt is made to explain in detail how these responsibilities are to be met or fulfilled.

Personal Responsibilities

1. Any man who undertakes to teach enrollees in a camp should be master of the skill or knowledge which he is attempting to teach, and at the same time master of the art of teaching. In some instances, it is possible for the instructor to acquire a skill or to secure knowledge which he may need, after he assumes the teaching job. In any case he must have the ability to teach, that is to say, the ability to put over to others what he knows or can do. Some men who are masters of the skill and knowledge to be taught do not have the ability to teach. Others, who have the ability to teach, are not masters of any trade or technical skill. A combination of these two qualifications is the foundation for effective teaching in any educational program.

2. The instructor should understand how workers learn on the job. As a foreman or a teacher, he is usually familiar with methods by which new ideas and habits are acquired, and knows the characteristics of workers and how they learn.

3. He should be resourceful in the use of tools in his occupation. If he is resourceful as a workman, he usually is resourceful as a teacher.

4. He is responsible for the safety of his enrollees while they are under his jurisdiction, whether in the classroom, in a school shop, or on the job.

5. He must be a leader of young men with sufficient dignity to gain and hold their respect. An interest in, and a sympathetic attitude toward, young men who are seeking instruction is of vital importance. He must be able to put himself in the place of these young men, and realize that the way he thinks may not be the way they think.

6. He must be fair and impartial in his dealing with learners.

7. He has the responsibility of understanding the learning difficulties of these young men, and should make an effort to learn how to help them overcome these difficulties.

8. He is responsible for discovering the good traits of each trainee, and for helping correct the bad traits. By proper guidance and instruction, he can build on good habits in the development of skills.

9. He must be a follower as well as a leader, and be at all times tolerant of the ideas, attitudes, and problems of these young men, who are making an earnest effort to get a new start in life, and do something with themselves.

10. He has a responsibility for cultivating a pleasing personality. No man can be expected to be an efficient instructor unless he develops an agreeable atmosphere in the classroom or shop. If he is cheerful, courteous, considerate of others, and alert, his students will reflect these qualities, and his success as a teacher will be fairly assured.

11. He must school himself in holding his temper. A real leader cannot afford to be hot-headed. He must be big enough to overlook insignificant remarks.

12. Good standing as a citizen is important. No man can be expected to hold the respect and interest of students unless he displays to a reasonable degree, loyalty, honesty, reliability, and leadership.

13. The instructor has a responsibility for growing professionally after he starts teaching. Someone has very aptly said, "When we are green, we grow; when we think we are ripe, we are beginning to get rotten." Growth comes through exercise of thinking, studying to do a better job, planning for efficiency, and developing a real interest in the job of teaching.

14. The instructor is responsible for being able to write and speak with sufficient clearness to impart his ideas to students, and give understandable directions, explanations, and instructions. While he is not hired to display his ability in the use of good English, he should nevertheless try to express himself clearly and concisely, so as to gain and hold the respect of his students.

Teaching Responsibilities

The responsibilities enumerated below are those involved in the specific job of teaching in C. C. C. camps. Every camp presents its own peculiar difficulties for teaching. They are so numerous that it would be folly to attempt to list all of them here. Only the more important ones are discussed.

1. The instructor is expected to familiarize himself with the rules and policies governing the educational program.

2. As an instructor he has the responsibility of putting over facts or ideas in an understandable way.

3. It is of vital importance that the instructor analyze his subject for teachable content, and arrange the material in the order of learning difficulty. He cannot expect to teach everything the learner should know in the classroom. Some ideas and skills must be acquired by practice on a real job. No amount of lecturing, demonstrating, or illustrating can take the place of this practice.

4. A knowledge of the simple teaching methods, and devices used in connection with each, is of great importance. No man can teach effectively and easily unless he is master of at

least the simple teaching methods (teaching tools) which best apply to the lesson he is to put over.

5. He must know how to get the attention of learners, how to hold the attention until it becomes interest, and how to develop this interest into usable learning. There are many ways of motivating learning. Some of these are discussed in chapter 5 under the heading "The use of the question as a thinking device."

6. The native ability, educational background, and the desires and interests of enrollees present a wide variation of learning difficulties. The instructor has a responsibility for studying these difficulties and meeting the individual needs of enrollees.

7. The instructor should realize that camp enrollees are men and must be treated as such. Formal academic methods of instruction and discipline may not be entirely suitable for them. The job or occupational kind of teaching and management is necessary.

8. He should appreciate fairly the difference between teaching individuals and teaching groups. He has a responsibility for giving special help to the individuals who need it most.

9. He must realize the difference between facts and ideas usable as functioning material and those which are simply informational, and must bear in mind always that his job is to teach—not simply to peddle out facts and information.

10. He is responsible for records and reports, recommendations when necessary concerning equipment, teaching conditions, the transferring or dropping of students for just causes, the approving of students for certificates, and the keeping of progress charts and such records as may be required of him under the camp rules and regulations.

11. He must be economical in the use of supplies and equipment. He is expected to guard against waste and damage to machines or equipment. The matter of conserving his time, as well as the time of the enrollees, must be given considera-

tion to the end that effective use may be made of it for training purposes.

12. He is responsible for class or shop conditions, such as the condition in which the room or space is left at the close of his class period, the seating of the students, and the light, heat, and ventilation. Although he may not be held directly responsible for these things, he has at least a cooperative responsibility in seeing that suitable and reasonable conditions prevail.

13. He is expected to help secure equipment and supplies for teaching purposes, such as special demonstration equipment and illustrative material.

14. He is responsible for coordinating the tie-up of classroom instruction with the work which the young men are doing on the camp projects. There will be many places of interest which should be visited from time to time in order that the instruction given in the classroom may be applied to the work job.

15. He is responsible for the selecting of references in which he makes assignments from the lists in the instructional outline, or from the books available in the camp library.

16. The instructor must be resourceful in substituting teaching devices in lieu of the real thing. He must resort to the use of all sorts of simple objects, illustrations, and devices in order to teach the lesson more effectively.

17. He is expected to make recommendations concerning equipment and where it may be had, and to work out with the camp educational adviser a program for more effective use of teaching equipment and devices.

18. The instructor must learn the rules and regulations of the camp, find out to whom he is responsible, from whom he is to take orders, suggestions, and directions. He is to familiarize himself with these rules and is expected to set a good example in following rules and regulations, thus encouraging the enrollees to respect them also. Such matters as hours of instruction, days of the week on which classes are to be held, equipment to be used, supplies to be ordered, and

records to be kept are all within the rules and regulations, and must be clearly understood.

19. Effective teaching under C. C. C. camp conditions requires the closest type of cooperation. The instructor must cooperate with the camp educational adviser, since it is the adviser who will help him work out his teaching problems. The instructor must cooperate with the superintendents of the projects carried on in the field. This is necessary in order that the training in the camp may be more effectively applied to the daily work of the enrollees. The instructor, who is often the foreman, must cooperate with other foremen, and attempt to coordinate the instruction in the educational courses with the work done by the enrollee under other foremen. He must likewise cooperate with other instructors in the camp in order that rules, regulations, and standards of procedure may be uniform; thus bringing about a better understanding and spirit of cooperation on the part of the enrollees. The instructor is expected to cooperate in the advertising of classes, to help develop an interest in study on the part of the enrollees, to post notices, to work with groups, and to do what he can to stimulate an interest in the educational program. The educational program will be efficient to the extent that all agencies cooperate to realize the objectives of the Civilian Conservation Corps program.

20. Another duty of the instructor is to approve the issuance of certificates to enrollees. This necessitates keeping records and progress charts, preparing examinations, and grading assignment and test papers, so that certificates may be awarded on the basis of real merit.

21. The instructor should plan his work well in advance. Equipment and teaching devices are often so difficult to secure that future planning is essential. Under the subject of "Methods and devices for efficient teaching" in this manual, devices are discussed which may be used for planning purposes. These include plans for securing equipment, lesson plans, job sheets, and questions.

22. The instructor is responsible for having some qualified person selected and approved who can teach the class should

the regular instructor be unavoidably kept away from class for a lesson or two.

23. It is impossible to specify which, if not all, of the above-described responsibilities any one instructor will find it necessary to assume. It is of vital importance, however, that the instructor, before he attempts to teach, determine in some way precisely what his responsibilities are.

Chapter 3 ★ *Methods and Devices for Efficient Teaching*

MOST people learn to do things through one, or a combination of the three fundamental ways of learning, namely, being told, being shown, or doing. That is, they learn to do something through someone telling them how to do it; showing them how to do it; or by doing it themselves.

The following are examples of the three fundamental ways in which we learn to do things:

Telling.—A farmer is listening over the radio to a farm-hour program. He hears an agricultural expert tell how to feed cows so that they will produce more and richer milk. He writes down the suggestions and tries out the theory, and later finds that the new way is successful. The farmer in this case got his new idea by being told, and through practicing the idea, learned how to feed the cows so that they would produce more milk.

Showing.—A national manufacturer of cutlery decides to put on a pocket-knife advertising campaign. Through his representatives he encourages the hardware stores to arrange for show-window demonstrations. A hardware store hires a clever wood carver and puts him in the window to show—demonstrate how well the knives will cut. In one of the demonstrations he whittles a ball in a cage out of a single piece of wood. An interested spectator watches the demonstration. He goes home and proceeds to whittle a ball in a cage himself and does it successfully. Here the learner got the ideas through someone *showing* him. He was told nothing.

Doing.—A boy has never ridden a bicycle. He has seen a few people ride. He wants to learn and, not having a bicycle, he borrows one and proceeds to try to ride it. After many tumbles and narrow escapes, he masters it. In later years he becomes a teacher of bicycle riding. As a boy he actually

learned to ride the bicycle through *doing*. It was purely a case of practice and experiment. He did all of his own thinking, arrived at his own conclusions, and made his own decisions, but he learned to ride through practice.

These three examples, all actual cases, illustrate that people can and do learn through one of three fundamental methods. In each of the preceding cases it should be noted that the learning was really accomplished when the learner had applied the new idea, however secured. The theory that "We learn by doing" is just as sound today as it was when it was announced by Comenius in the seventeenth century.

Had each of the learners in the above example been taught through an organized lesson or procedure, a combination of the three methods would no doubt have been used, and each would have learned more quickly. In part at least each would have learned through having been *told*, in part through being *shown*, and in part through *doing*.

In the first example above, *telling*, could not have been of value to the farmer if he had had no experience on which to build the new idea, and if conditions had been such that he could not try it out or practice it. The second example, *showing*, was somewhat like the first, only each operation in whittling the ball in the cage was carefully demonstrated, and the observer tied the new idea up with old practice or experience, *i. e.*, with his own past experience along somewhat similar lines. Without the old experience to tie up with the new idea, it is doubtful if he could have made the ball in the cage after merely being shown how to do it. The third example, *doing*, is a clear case of learning through practice. The boy had no experience and very little, if any, information about the bicycle. The learning process was in all probability very wasteful of time and effort, but was, nevertheless, effective in this case. An organized procedure for teaching in these cases would have in some measure at least reduced the time, effort, and money required.

Checking.—Since we learn through some combination of the three fundamental ways of learning, we should organize our

teaching to make use of these procedures. In the teaching procedure we need to add one more method to the learning process, which is the *checking* step. This fourth method is for the purpose of examining or checking the learners to determine whether or not they have actually acquired the new idea or skill. *Telling, showing, doing, and checking* are therefore the four fundamental methods of teaching as discussed here.

Each of these fundamental methods can be subdivided into particular methods. For example, *telling* is subdivided into the particular methods dependent respectively upon (1) *talk*, (2) *discussion*, (3) *conference*, (4) *recitation*, and (5) use of *printed material*, which are particular ways of imparting information.

Method.—As defined in Webster's dictionary and as generally understood in teaching circles method means "an orderly procedure or process which follows a plan or design; a regular way or manner of doing anything."

Methods of teaching have often been referred to as the tools an instructor uses in putting over a lesson. A good workman has his kit of tools, and he uses each tool to overcome some difficulty encountered in the performance of his job. He may have special tools for special difficulties. The skilled instructor likewise has his kit of tools, and they are here discussed as methods and devices which he uses in the performance of his teaching job.

Device.—A *device* is a design, plan, scheme, stratagem, project, tool, instrument, appliance, contrivance, or expedient. Here it refers to anything which expedites the use of a method of teaching.

When the instructor encounters a learning difficulty on the part of the student, which he as instructor has not overcome through the normal procedure, he selects the special teaching tool (method or device) which will most easily and effectively help him put over the new idea to the learner. He may have been using the methods of *telling* and *showing*, and the devices best suited to those methods and to that particular part of the lesson, but if it develops

that the learner does not get the idea; the instructor proceeds immediately to use *demonstration* in place of *illustration*. As soon as the particular idea has been put over and is understood by the learner, the instructor discontinues *demonstration*, and goes on with the lesson using methods of *telling* and *illustrating*.

A good workman selects only the tools he needs to do the job quickly and easily. Likewise, the instructor should use only the methods and devices needed to teach quickly and easily. He should not attempt to use all methods and devices in putting over a lesson. He is expected to know what the teaching tools needed for the lesson are, and how to use them at the right time. Dr. C. R. Allen, author of *The Instructor, The Man and The Job*, once said that "Efficient teaching is to put into the head or the hand of the learner that which he did not know before with the least amount of effort on the part of the learner and instructor."

An efficient instructor, therefore, makes sure that he has put over his lesson, but in doing so he does not make the learning harder than is necessary for the students. Neither does he make the teaching more difficult. No one can be a competent instructor unless he knows and understands *how* and *when* to use certain teaching methods and devices. It is true that there are some people who do an excellent job of teaching without having been taught how to use methods and devices, but invariably the successful instructor proves to be one who has formed good habits as a workman, and has learned how to organize his thinking so that other people understand him when he gives orders or teaches a lesson. He has what some people call the "knack" of teaching. *Good teaching is nothing more than the organized application of common sense.*

The following chart lists the fundamental methods, the particular methods, and the devices most commonly used in the teaching of vocational subjects. It provides a simple, direct means of visualizing the four fundamental methods and the particular methods and devices used in teaching as discussed here.

Chart 1. ★ Methods and devices for efficiency in teaching

Fundamental method	Particular method	Device
I. TELLING Any telling of facts or ideas through words spoken, written, or printed in any form.	1. Talk.....	1. Talk by instructors. 2. Talk supplemented by visual materials. 3. Talking movie. 4. Radio. 5. Television. 6. Phonograph. 7. Learners' oral report (talk).
	2. Discussion.....	1. Informational question. 2. Suggestive question. 3. Interchange of opinions and ideas among learners. 4. Interchange of opinions and ideas between learners and instructor. 5. Blackboard analysis procedures.
	3. Conference.....	1. Blackboard analysis procedures. 2. Informational question. 3. Suggestive question. 4. Interchange of opinions and idea among learners.
	4. Recitation.....	1. Oral reports. 2. Answers by learners to questions.
	5. Use of printed material.	1. Job sheets. 2. Operation sheets. 3. Instruction sheets. 4. Information sheets. 5. Lesson sheets. 6. Blueprints. 7. Textbooks. 8. References. 9. Assigned readings. 10. Notebooks of others.
II. SHOWING Any use of the eye for teaching other than with printed material.	1. Illustration.....	1. Charts and diagrams. 2. Blackboard sketches. 3. Blueprints. 4. Still pictures. 5. Slides and still films. 6. Moving pictures. 7. Cut-away models. 8. Working models.

Chart 1. ★ Methods and devices for efficiency in teaching—Contd.

Fundamental method	Particular method	Device
II. SHOWING—continued Any use of the eye for teaching other than with printed material.	2. Demonstration-----	1. Real object. 2. An object similar to the real thing. 3. Laboratory experiments (learners). 4. Instructor experiments. 5. Performance of job by instructor before group. 6. Performance of job by instructor before individual. 7. Off job (special equipment, models, etc.). 8. Samples of work
III. DOING Performance in some way by learners.	1. Exercise-----	1. Job or operation sheet. 2. Job planning sheet. 3. Blueprints or sample. 4. Tools and equipment for testing. 5. Telling by learners how they will do the job. 6. Practice in doing. 7. Job-checking sheet. 8. Assistance by instructor when necessary.
	2. Project-----	1. Job or operation sheet. 2. Job-planning sheet. 3. Blueprints or sample. 4. Tools and equipment for testing. 5. Telling by learners how they will do the job. 6. Practice in doing. 7. Job-checking sheet. 8. Assistance by instructor when necessary. 9. Production work materials. 10. Production machines or tools.
	3. Production job-----	1. Job or operation sheet. 2. Job planning sheet. 3. Blueprints or sample. 4. Tools and equipment for testing. 5. Telling by learners how they will do the job. 6. Practice in doing. 7. Job-checking sheet. 8. Assistance by instructor when necessary. 9. Actual machines or tools. 10. Real materials. 11. Practice work machines or supplies.

Chart 1. ★ Methods and devices for efficiency in teaching—Contd.

Fundamental method	Particular method	Device
III. DOING—continued Performance in some way by learners.	4. Experiment..... 5. Class room performance.	1. Job or operation sheet. 2. Job planning sheet. 3. Blueprints or samples. 4. Tools and equipment for testing. 5. Telling by learners how they will do the job. 6. Practice in doing. 7. Job-checking sheet. 8. Assistance by instructor when necessary. 9. Actual machines or tools. 10. Real materials. 11. Laboratory work. Learner finds out things for himself on controlled shop job. 1. Participation of learner in discussion. 2. Participation by learner in conference. 3. Questions asked by learners. 4. Answers by learners to questions asked. 5. Looking up references. 6. Making reports. 7. Teaching tests.
IV. CHECKING Any inspecting, checking, measuring, and grading of the work of learners by instructors.	1. Checking learners' performance as to method and results.	1. Inspection of procedure by instructor. 2. Inspection of procedure by another student. 3. Questions asked by instructor. 4. Filling out job-checking sheet by learner. 5. Writing job report on how by learner. 6. Writing of job in log book by learner. 7. Performance test. 8. Comparison with work of others. 9. Instructor conference with learner regarding errors.

Comment on the Chart

It is not necessary to discuss in detail many of the items included in the foregoing chart. It is believed, however, that certain of the items need further explanation in order that they may be clearly understood.

Telling or informing.—Telling is used in instructing people any time during the training when it is needed, and it may be done in a number of different ways.

As stated in column 1 of the chart, telling is any telling of facts or ideas through words spoken, written, or printed in any form. Column 2 lists five particular methods or ways of telling.

It has been said that talking or lecturing is not teaching. On the other hand, some instructors get the idea that they are paid for talking or lecturing only. In fact, the type of student, the subject matter, and the group for which the course has been prepared will in any given case determine the amount of talking that should be done by the instructor. The more successful instructor carries on a discussion with the students in the class, the learner doing his own share of the talking. The instructor who has acquired the knack of asking questions so as to develop ideas and cause the students to do some constructive thinking, may do considerable talking, but there is a difference between simply peddling facts and dealing with them in a manner that will cause the students to do something other than listen.

Discussion.—Discussion is the exchange of ideas regarding such things as trouble-shooting engine failures, simple science, the right mixture for concrete, how to fight a forest fire, and what causes a radio set to stop working. The purpose is to get the class to think freely regarding a question, so as to bring out both sides of the question where there are two sides; to pool the experience of the class in developing necessary facts and ideas; to draw conclusions based on facts; to summarize decisions, and the like. The instructor can be described in such words as leader, referee, or conductor who keeps the game moving, keeps up interest, prevents the dis-

cussion from dragging, guides by careful questioning and suggestions the discussion in the direction of the things he wants brought out; and aids the group to arrive at definite facts and conclusions, analyses, and summaries. These class discussions, properly managed, furnish rich opportunities for all such experiences as interpreting what others say, analyzing things, organizing facts and ideas, getting facts and ideas from others, drawing conclusions, making decisions, and summarizing facts and ideas. This procedure is often referred to as the conference method, but for our purpose here we desire to classify it as discussion. The conference method is discussed elsewhere in this manual.

How to conduct a discussion.—Possibly some suggestions as to how to conduct a discussion will be of value to instructors, particularly to those who have had only a limited amount of experience in teaching vocational subjects. There are a number of ways in which a discussion may be started. The idea to be kept in mind is that whatever start is made, it must be something which directs the attention and interest of the group toward the topic. This can be done through the relating of a short story, reading of a brief article, raising a question which has previously been asked, asking a direct question, or citing a case to which the topic under discussion can be applied. A diagram of a problem may be drawn on the blackboard. The writing of the topic on the blackboard may be all that is necessary. And there is a possibility of setting up an analysis device with headings such as "pro" and "con", "advantages" and "disadvantages", or the "what", "why", and "how."

How to get all learners into the discussion.—One way is to let them talk freely. Another is to ask suggestive questions or to cite them a problem which applies to specific individuals in the group. Above all, the instructor should remember to be cheerful, and if necessary, joke a little once in a while. If he has any shy individuals in the class, he should study them carefully and find out how they can best be handled. He can ask simple questions. If the shy individual has difficulty in answering these questions, the instructor can help

him with the answers, and after he has answered, compliment him on the assistance that he has given with the problem. Using the knowledge of the shy ones to solve simple problems will encourage them to work and they will feel that they have been helping with the lesson.

Another way to handle the shy individual is to ask him if he agrees with certain opinions that have been expressed. It is possible in some cases to introduce a subject about which the individual can talk, and if so, let him express himself in his own words. Develop in him, if possible, the idea that he is as much a part of the class as anybody, and, whenever possible, draw out his opinions to encourage him to do better.

The fast learner is another type of individual. One way to handle him and keep him in balance with the other members of the class is to use him as a secretary. Give him a special job. Make arrangements beforehand to use him as a check-up man, and when the others have failed to arrive at the proper answer, put the question to him for his help. Occasionally, it may be advisable to ask him a question which he cannot answer, thus demonstrating to the rest of the class that even the most brilliant cannot answer all questions. In some instances it may be advisable to make the fast learner feel that he is depended upon to help put the lesson over. Let him make special reports and give him extra work to do outside. In many instances this type of learner, if he is properly managed, can become a most valuable member of the class. It is advisable, however, to govern him so that it will not appear that he ranks privileges not granted other members of the class.

How to avoid dangerous issues.—Discussion can reach a point where it may run into dangerous issues. This is particularly true in foreman training classes and with experienced groups. An instructor is not expected to sit as a judge and give decisions concerning arguments and policies. Should it be indicated that dangerous topics are being brought up for discussion in the class, the instructor should analyze the situation, and if it is considered unwise to deal with any

given topic, lead the discussion away from that topic. One safe way is, of course, to stay away from dangerous topics. Recognize them early in the discussion, and switch the subject to something of greater interest to the group if possible.

Another way is to promise to bring the dangerous issue up at some future time. This will make it possible for the instructor to secure additional information before discussing it, and it also sets up the possibility of the topic being forgotten. A story to switch the interests of the class is a clever device for changing the topic. Frankness and honesty will help, and if the case warrants it, the instructor should tell the class that the dangerous issue is not a part of the lesson, and should refuse to discuss it.

How to handle heated arguments.—It is a common thing in large discussion groups to find a heated argument creeping into the lesson. Here again suggestions as to how to avoid undesirable conditions may be worth while. A change of subject or telling a joke may do the trick. The situation can be analyzed by the entire group, and a vote can be taken on it, provided that in the opinion of the instructor this is the wise course to take.

Changing the type of discussion, tactfully quieting leaders, and shaming those who are making the disturbance may be the way out. An appeal to pride will sometimes overcome the difficulty. As a last resort a recess may be called, and the group left to settle the issue later.

How to stay on the discussion topic.—Planning a discussion in advance will make it possible for the instructor to keep within the limits of the topic under consideration. By avoiding getting off of the subject and by sticking to the outline, asking direct questions, and not taking a side track, the discussion can be completed within the limits of the subject selected. If some issue comes up which does not belong in the discussion, one way to avoid taking the side track is to list this topic on the blackboard and indicate that it will be discussed at some later date. Above all things it is important that any conversation carried on in the class in connection with the discussion shall be in a tone of voice which makes it possible for every member in the class to hear.

Informational question.—An informational question is one which is asked for the purpose of securing information which the instructor has reason to believe the learner possesses. The answer to an informational question is usually either something recalled through memory or an experience. In most cases it does not require any reasoning or constructive thinking on the part of the person answering, but only the telling of something one already knows. Answering involves an exercise of memory. The following are typical informational questions:

1. Who discovered America? The answer gives the name recalled of the man accredited with the discovery of America.

2. What instrument, which measures accurately in small divisions, is used to determine the diameter of cylindrical objects such as shafts and piston pins? The question anticipates recollection of the name "micrometer."

In each of these cases answering the question is a matter of simply recalling information. Should the learner experience difficulty in answering, the instructor may assist him through the use of a suggestive question.

Suggestive question.—A suggestive question is one asked for the purpose of causing the learner to do constructive thinking or reasoning to supply the correct answer. It indirectly suggests the answer, but leaves the learner free in the matter of arriving at his own conclusion or reason for answering as he does. It is a device commonly used to direct the thinking of learners so that they may arrive at the answer through a chain of reasoning or an association of ideas. Properly used, it stimulates thinking and guides the learner through a series of steps in a process of formulating the logical answer. The suggestive question is used also to develop a problem or subject where the information is not definitely known in advance, but is developed gradually through skillful questioning.

By way of illustrating the informational type of question, two questions were cited above. The same questions may be used here to illustrate how a suggestive question can be applied in case the learner does not immediately recall the answer to the principal question.

1. Who discovered America?

Reply.—I cannot recall; I am not sure.

(a) *Suggestive question*.—Why was the capital city of Ohio given the name it now bears?

Answer.—It was named after Columbus.

(b) *Suggestive question*.—Then, who discovered America?

Answer.—Columbus.

2. What instrument, which measures accurately in small divisions, is used to determine the diameter of cylindrical objects such as shafts and piston pins?

Reply.—I don't remember.

The following questions can be used to develop the answer:

(a) How is water measured when purchased for home use?

Answer.—Water meter.

(b) Are gas and electricity measured in the same way?

Answer.—Yes, by meters.

(c) Then what does meter mean?

Answer.—To measure.

(d) What instrument does the doctor use to look at blood and other matter to discover germs?

Answer.—Microscope.

(e) What do they talk into when broadcasting a radio speech?

Answer.—Microphone.

(f) Why are small germs called microbes?

Answer.—Because they are small, tiny germs.

(g) What does the part of the word "micro" mean?

Answer.—Small; tiny.

(h) Then what is the name of the instrument used for accurately measuring small cylindrical objects?

Answer.—Micro meter (micrometer).

The final answer to the second question cited above was built up through a series of suggestive questions some of which were in themselves informational or recall questions, but since they were asked to suggest the answer sought, they are here considered as suggestive questions. The way a question is asked and the purpose for which it is asked, will determine to a large degree whether it is informational or suggestive. The suggestive question in most cases causes

the learner to do more constructive thinking to get the right answer than informational questions commonly require.

Blackboard analysis procedures.—The blackboard analysis procedure as referred to here is essentially a listing of related topics for discussion—either a simple listing or a listing in parallel columns under proper headings—in such a way as to enable the learner to see the relationship of one factor to another and direct his attention and discussion to the topic in the indicated relationship. The instructor should be careful in working out the scheme of analysis for grouping related factors. If he sets up insignificant or misleading analysis headings for his discussion, the whole analysis and the discussion will be futile. An example of blackboard procedure is a 2-column analysis, such as is indicated below:

What a worker does in an occupation	What a worker needs to know about an occupation
1. 2. 3. Etc.	1. 2. 3. Etc.

A three-column analysis of radio receiver troubles might be set up as follows:

Trouble	Probable cause	Remedy
1. 2. 3. Etc.	1. 2. 3. Etc.	1. 2. 3. Etc.

Another simple procedure is what is known as the laundry list. This is commonly used in foreman-training work, and consists of listing in one column any number of things which may fall under the heading selected for discussion. For example under the heading "For what reasons do men lose their jobs?" may be listed all such things as loafing, wasting

materials, and too much time off the job. There are any number of other blackboard procedure devices which can be selected for drawing out the ideas of students in discussion. However, those noted above will illustrate the procedure sufficiently for our present purposes. Those interested in searching further for information concerning blackboard procedures are referred to *Foremanship and Supervision* by Frank Cushman, published by John Wiley & Sons, Inc., New York.

Conference—The conference is an educational procedure consisting of informal but systematic group discussion carried on by experienced persons under the direction of a leader.

Its special function is to provide an opportunity for constructive thinking on the part of individuals, under the stimulus of the best minds in the group and on the basis of contributions from their varied experience. This participation in the thinking-through process may be regarded as the ultimate aim of conference work, but there will always be many immediate and indirect objectives in view as well. The very nature of the conference procedure forbids the direct presentation of definite, preconceived goals, such as might well be attained by direct instruction or by "telling." On the other hand the group must be conscious of certain situations which need attention as a center of interest for their discussion. The leader also should have in mind certain objectives which he will try to work out if the discussion develops as he anticipates. In short, a conference should start with a problem or situation with which the group is concerned, but its outcome will depend upon the soundness of the thinking done.

The general aims of conference work may be stated as follows:

1. To develop habits of constructive thinking.
2. To modify attitudes of members of the group.
3. To pool the experience of the members of the group on the job under discussion.
4. To develop a basis for modification of practice.

5. To secure group action in cases where this is appropriate and feasible.

Some of the specific results that may be expected from use of the conference procedure are:

1. Stimulation of individual thinking.
2. Pooling and exchange of experience.
3. Evaluation and use of facts rather than mere fact getting.
4. Introduction of different points of view.
5. Development of the give-and-take attitude.
6. Friendly constructive discussion rather than bitter contentions.
7. Constructive thinking rather than rationalizing for the purpose of justifying a preconceived idea.
8. Individual participation in matters of common interest.
9. Balanced thinking.
10. Getting sufficient facts before making a decision.

The conference method has a definite place in camp training programs although enrollees may have a limited background of occupational experience. The conference group will be strengthened if some older men are enrolled.

When used in C. C. C. camp classes for developing subjects about which the enrollees have some knowledge, the suggestive and informational questions will be found most valuable devices to further the conference procedure.

Recitation.—The purpose of the recitation should be to find out what the learners understand or do not understand, not what they remember or fail to remember. The class should have the attitude of a group who have done their best to get ready for the lesson, and who have come to the class prepared to show this to be true.

The instructor should believe he is teaching something worth while; otherwise the lesson is a waste of time. It is worth while only when the student understands; otherwise he will forget, even if he can glibly give a book or memory answer. So the instructor works with the class to bring out the important facts or ideas. Constantly, he asks, "Why

is this true?" "Why is this done?" "How do you do it?" "What makes you say that?" "Are you certain you are right?" "When does that happen?" "What difference does that make?" "What formula do you use?" "How do you solve the formula?" "At what point did you have trouble?" "What is there you do not understand?"

A successful program calls for clear, specific, definite lesson assignments. It calls also for some discussion at the time of assignment to prepare learners for the intelligent study of the next lesson. The purpose of the recitation should not be to "jack up" pupils or test them for grading purposes, but to help them study, learn, and perform. Tests for *marking* purposes, if desired, can be given at the close of the course or at the close of the consideration of any subject. Learners should, of course, be expected and required to study, but there are other easier and less time-consuming ways of finding out whether they have studied or not than to turn the recitation into a detective agency, merely for finding out what a learner does not know and scolding him for it. When the recitation is conducted for the purpose of teaching members of the class to understand what they need to know, they will be trained in thinking straight about facts and ideas. Whenever the recitation is turned into a drill on facts and ideas, memorized but not understood, real thinking on the subject ceases. The fact that so few learners know how to work in the way described above, makes it all the more necessary that we train them in that way.

Use of printed material.—In connection with the particular method, *use of printed material*, the chart lists a number of devices in the form of printed sheets, which may here need some explanation.

1. *Job sheets.*—The job sheet primarily tells what to do and seldom gives any information as to how the job is to be done. It is criticized by many educators as a device which does too much thinking for the student, because the student does not learn to develop initiative through being told to do everything. If, however, the job sheet is properly used, it is an efficient device. It should not be used for all jobs, but

only for those done at the beginning of each level in the course. It can assist in developing a habit in the enrollee of doing his thinking in a systematic, definite way. Some instructors refer to the job sheet as an operation sheet. Regardless of the name given it, it usually sets up the steps or sequence in which a given job or operation is to be performed. The following job sheet, for example, covers the changing of a tire on an automobile:

Operations:

1. Set the brake.
2. Remove the spare tire from the carrier.
3. Jack up the car.
4. Remove the hub cap.
5. Remove the wheel and the flat tire.
6. Put on the spare tire.
7. Put on the hub cap.
8. Let the car down.
9. Mount the punctured tire and wheel on the carrier.

Other steps—such as the getting of tools, and the taking of necessary precautions—have been eliminated here, since the idea is to show only the main steps of the job.

2. *Instruction sheets.*—An instruction sheet usually tells what to do and how to do it—“*what*” and “*how*.” The instruction sheet is, in so many cases, the least efficient teaching device, because it is too often used to take the place of the instructor. A typical example of an instruction sheet is the printed instructions which are furnished with a new automobile, a sewing machine, or a vacuum cleaner. In each case a printed booklet telling what to do in the operation of the machine and how it is done is supplied. Instruction sheets can be of value when properly used with students who enroll after the regular course of instruction has begun, but should not be used to take the place of an instructor. Certainly the student will not do very much independent thinking or reasoning when all information is furnished.

3. *Information sheets.*—An information sheet, as commonly referred to, is any sheet which provides information. Where it is carefully planned, it usually provides only the “*why*.”

It may also furnish additional or auxiliary information concerning the job. The information sheet, as most commonly used, contains only the technical information which cannot be secured from ordinary textbooks. An example of an information sheet would be a printed page or two covering some special phase of the operation or construction of some new device, which is not as yet included in ordinary text material. When of this character, it can be a device of much value to enrollees, as it places in their hands information of a definite type which they can study and absorb during leisure time.

4. *Lesson sheets*.—Apparently, lesson sheets have not been clearly defined by vocational people. A study of samples secured from several courses shows that lesson sheets range all the way from job sheets, mixed with instructions and information, to suggestions regarding a lesson or a job to be done. In many instances, the lesson sheet is a mixture of the job or operation sheet, the instruction sheet, and information sheets. It is anything that one cares to make it, as long as it applies to the lesson. It should contain specific information bearing upon the lesson or subject. There are many forms of such material.

Illustration.—Eight devices are suggested for use in this particular method. An illustration is usually some form of showing people something other than the real thing itself. Sometimes an illustration is a better teaching device for certain steps in a lesson than the real thing itself. For example, a cross-section drawing may show more to the learner, and give him a better idea of the inside construction of a device than the real thing. If the real thing is cut into sections, then it is of greater value as a teaching device than the illustration, because there is no need for one to call upon the imagination to visualize the real thing.

Some instructors do not know how to use illustrative material efficiently. When one understands the fundamentals of teaching, it is not difficult to realize that whenever something is shown other than that which applies directly to the lesson, the attention of the learner is directed toward the new

device or illustration. Therefore, when using illustrative material, it should be used only at the time it is to be applied to the teaching. Charts and diagrams should not be put up on the blackboard or walls until the time for use. There may, of course, be instances where it will be advisable to set up the illustrative material beforehand to save time. However, this practice should be kept to a minimum. The illustrative material is most valuable when it is presented in its proper sequence and in connection with the teaching of each point of the lesson.

Demonstration.—A demonstration shows how to do a piece of work, a job, or something that is to be done. It should be done in such a way that those who are being shown will be able to see and do the thing that has been demonstrated. Before starting the demonstration, the learner must know exactly what he is expected to see or learn, and the instructor needs to have clearly in mind the result of his demonstration. The demonstration must be well planned, if it is to be effective. The instructor must know what he will do, where he will do it, and the order in which he will do it. He must make sure that he has practiced it to the point where he will not fail in the actual demonstration. Everything should be in readiness. If he has to stop for tools, materials, or anything else, the attention of the group is interrupted, and the demonstration will be less effective.

A common mistake in demonstrations is to make them too long. It is much better to divide a long demonstration into shorter parts and complete each part before going on to the next one. If it is carried on too long, the learners have too many new ideas to absorb before they can apply them. It is a mistake for the demonstrator to mix conversation with his demonstration. He should not attempt to impart all the auxiliary information which may be needed by the learner in connection with what is being done. The demonstration should include only the doing and a minimum of information or explanation. Of course, some telling and explaining will be required in the demonstration to emphasize certain steps in it. The demonstration should be presented

so that it can be seen by all. If this is impossible, divide the class into smaller groups and give separate demonstrations to each group. Make sure that all can hear everything that is said during the demonstration. Hold the attention of everyone and conduct the demonstration so that you will have order and quiet.

Immediately following the demonstration the learner should be allowed to apply the new ideas in practice. If it is discovered that the learner did not grasp all of the steps in the demonstration, the demonstration should be repeated. In giving the demonstration, it should be remembered that the instructor is showing something to be done and that, if he makes a mistake in the demonstration, he may expect the learner to do likewise. The students will try to do as he did. If he has been wrong, they will be wrong also. In some instances the application cannot follow the demonstration until some time later. If this is known in advance the significance of the demonstration should be particularly emphasized, and the demonstration in whole or in part repeated if necessary.

Exercise.—Exercise, as referred to here, is performing some manipulative job on a practice basis. For example, in automobile repairing a student may be required to fit rings to a cylinder, which, being no longer suitable for practical purposes, is a piece of practice equipment of the school. In this instance the student would be required to select rings to fit the cylinder according to predetermined standards.

Another example would be exercise in making splices in house wiring where the enrollee takes pieces of wire and makes simple splices. After the splices have been made and the wire is no longer usable, the splices are thrown away. This method is used in a number of vocational schools because of the lack of actual production material upon which the students can work.

Job planning sheet.—A job planning sheet is a device which is not commonly used by all vocational schools. It is a sheet or form upon which a student plans a job before he starts to do it. For example a student is given the job of changing a

tire on a Hudson automobile, and is asked to fill out a job sheet giving exactly, by step, how he will proceed to change the tire. When this job planning sheet is completed, it is presented to the instructor, who checks it, makes corrections, and when it has been approved by the instructor, the student is allowed to proceed with the job as he planned it. This device properly used is an excellent teaching device.

Device No. 7, the job checking sheet, as listed under the particular method "project", under the fundamental method "doing", is a sheet which is used either in connection with the job planning sheet or with the job sheet. It is a sheet which contains some typical check-up questions on the job done by the student. It is a form which the student, after he has completed his job, is required to fill out and bring to the instructor for checking. This is particularly valuable where production work is being carried on by learners, and provides a means whereby the instructor can more accurately check the work of a group of individuals for detection and correction of any mistakes made.

The job planning and job checking sheets are devices which may not be extensively used in the training of Civilian Conservation Corps camp enrollees. They, as well as numerous other devices, are left in the chart as typical examples of the type of devices which can be used for providing training in vocational subjects.

Project.—This particular method differs from the exercise in that a project usually requires not only the execution of the operations of the job comprised in the project, but also the complete planning of the job or project. The project as a particular method is of greater training value than the exercise, because it requires the student to think through the project from beginning to end. It stimulates his thinking more because it throws him upon his own resources. The project method cannot be used under all conditions, because of limitations placed on schools pertaining to production work.

Production job.—This method provides for the actual doing of a job according to production standards, or at least the

production standards as set for the course or group of individuals taking the training. It is not always possible to train under production conditions. Training under these conditions, however, will provide training of the greatest possible value because the learner is working on the real thing, is producing something that will be used, and will work harder to get to do the job because he realizes that his efforts will not be wasted. The devices indicated in the chart may be used by the instructor in helping learners who are being trained under production conditions.

Experiment.—This particular method is used to only a limited degree in the majority of training programs. It applies particularly to the types of training where the student is required to experiment with a number of ideas in the working out of a definite problem. The 11 devices set up in connection with this method are only suggestions as to how this method can be more efficiently used.

Checking a learner's performance.—Under this particular method there are two general objectives. One is the matter of checking the student as he performs a job, so that the instructor can assist him in overcoming some of the difficulties which he encounters in the performance of the job. The other objective is testing the student for the purpose of determining whether or not he can actually do the job as taught. This implies an examination, or fourth step in the lesson, to satisfy the instructor that the student can perform according to the standards set up for the subject. The nine devices listed in connection with the checking of the learner's performance are suggestive of aids which may be used in connection with this method.

The misuse of examinations.—The instructor who attempts to use the formal examination in connection with the C. C. C. camp instruction may find that his students are losing interest and dropping out of his class. The formal examination has little or no place in this type of program. In its place there should be substituted a constant checking system from lesson to lesson through discussion, informational and suggestive questions, and other devices.

The examination as conducted by most instructors is given for the purpose of sampling the knowledge of the subject possessed by the students. It is much better to use in its place a method which will not only provide a sampling of what the student knows, but will also assist in motivating the learning of the students. For a discussion of the use of the question as a thinking device see pages 54 to 58 of this manual.

In some instances short lists of true-false questions, or of incomplete, multiple choice, or other types of questions may be effectively used. To insure success, however, any such questions should be carefully prepared in advance. It will be necessary to write them out beforehand and have them typed, mimeographed, multigraphed, or otherwise reproduced before the lesson is to be presented. Some instructors use the true-false, multiple choice, or other types of objective questions as a study device, and have the students answer the questions at home. Then when the class is called to order, each student retains his own copy of the questions, and a discussion is held on the correct answers. The student grades his own paper, and the instructor does not know what the grade is, nor does he need or care to know. The students are asked to check themselves on the questions missed, and read up on or secure information about them. This method has proved to be successful. It is at least worth trying.

Examples of test questions.—The following are only a few samples of the different types of questions used to test and check up students:

1. *Essay type.*—When an auto mechanic is sent to aid a stranded motorist who reports that the engine of his automobile has stopped and refuses to start, what is the procedure the mechanic should follow in locating the trouble?

2. *Incomplete type.*—Fill in the correct name in the following: A brick wall is kept level by using a ----- in the center of the wall. Most storage batteries used in automobiles are of the ----- volt type.

3. *True-false type.*—Draw a circle around the T or F to show which you think is correct—T, F: A hack saw is used

to cut iron, screws, nails, or brass. T, F: For laying brick, a lime mortar is a stronger binder than a portland-cement mortar.

4. *Multiple choice*.—Underscore the word or words to make the statement correct. The tool most commonly used by a brick mason is the (hammer), (chisel), (trowel), (shovel), (line). A painter mixes the colors (white), (yellow), (red), (blue), (black) to make a green paint.

Chapter 4 ★ Teaching a Lesson

THE shop lesson.—Teaching a lesson is very much like performing a work job; all work should be planned, but a teaching job should be carefully planned. If a mistake is made in performing a work job, only a little time or material is wasted, but if a mistake is made in doing a teaching job, the learner may be started in the development of wrong habits. An instructor usually deals with a number of people at one time, and any error is multiplied by the number of students in the class; consequently, the ultimate cost in time and money may be great.

Anyone who attempts to teach should, as far as possible, be master of all conditions. To teach means to direct, to show how, to guide the studies of, to impart knowledge, or to manage the mind. Efficient teaching requires that one shall first secure the attention of those he is attempting to teach. He must hold this attention until the student is interested, and then guide the interest until it results in effective learning.

The teaching sequence discussed here is: Attention, interest, preparation, presentation, application, and test. Attention and interest have been added here as preliminary steps to the well-recognized four steps.

Too many instructors attempt to teach without first getting the attention of all members of the class. Whispering or talking by some students while the instructor is trying to teach, may confuse and distract others. Those talking certainly are not getting what the instructor is attempting to present.

There are numerous ways of securing the attention and interest of students, but above all get it, then proceed with the preparation, presentation, application, and testing.

The arrangement of the class in the room will have much to do with the efficiency of teaching. Small classes held in

a large room should be assembled in the room in an orderly manner. When students are permitted to find seats for themselves just any place in the room, it may be difficult for the instructor to hold their attention and maintain order. When students are assigned regular seats, better teaching conditions prevail than when they are permitted to scatter throughout the room. An orderly arrangement also makes it possible in some cases, to turn out certain lights in the room, thereby reducing the cost of operation. If for no other reason, a well-arranged class presents a better appearance to a supervisor or to visitors, and indicates that the instructor has given attention to the efficient management of his work.

A new instructor sometimes experiences difficulty in confining the discussion to the lesson which he is supposed to teach. The wise instructor plans each lesson, sticks to his lesson plan, and avoids "side tracks." He may vary slightly from the outline, but in general he teaches what he started out to teach.

The four-step lesson procedure.—This procedure lends itself more particularly to the teaching of vocational subjects. One may illustrate the procedure simply. In planning a vacation trip, for example, such questions as the following may be asked:

Going on a vacation trip? Yes; we all hope to do that sometime. Where? Well, that is a very important point to settle. How shall we approach our destination—by air, by water, or by land? What method of travel shall be used—airplane, boat, train, bus, or auto? What shall we carry with us? Certainly, we will take only what we actually need; there must be no excess baggage.

A decision must be made on all of these points before preparations can be made for the trip.

Every lesson that is taught has its parallels in the planning of a trip. The objective or aim of the lesson corresponds to the destination of the trip; the approach to that destination, to the line of approach of the lesson; the way one travels has its parallel in the methods of teaching; and the stations at which one stops and what is done at each

station correspond to the content of the lesson. Remember, in teaching a lesson, as well as in taking a trip, one must know *when* "to get off."

1. *Preparation step.*—The first step is the preparation of the learner's mind, which must be made ready to receive the information to be given. The skill of an instructor is tested in this step. He must be able to determine whether the learner has knowledge on which the new information can be built. The learner can interpret this new information only in terms of his past experiences. Unless the instructor knows that the learner has knowledge which can be used as a base for new information, he should proceed as though the student had no such information. He can use suggestive questions—questions, that is to say, which do not require specific answers, but are so formulated that the learner is led to think in the channel along which the instructor wants him to think. In this way his mind is made ready for the lesson.

Cleverly relating an experience will often prepare the learner's mind for what is to be taught; or the instructor may ask informational questions, if in preparing the learner's mind he wants to have the learner recall something that he, the instructor, knows the student knows. This knowledge becomes the learner's apperceptive base upon which to build the new information.

A demonstration without explanations may be used to attract and hold the learner's attention, and provide a foundation for the new information. New knowledge is seldom imparted in the first step.

The first step, preparation of the learner's mind, must not be too short or too long. There is a psychological moment that must be recognized, and when the proper time comes the teaching should be started. If the time taken is too long, interest will be lost and the learner's mind will wander. The psychological moment is when the learner is ready to ask himself: "What next?"

2. *Presentation step.*—In the first step, little or no new information is given the learner. The learner's interest has

been aroused and his attention focused on one idea, which is the basis on which to build the succeeding new ideas. Presenting new ideas and tying them up with these basic ideas is the object of the second step—the presentation.

Various methods and devices have been developed for carrying on this instructional process, as various tools and machines have been developed for carrying on industrial production. Just as suitable tools and machines must be used to get the best results on a given production job, likewise suitable methods and devices will give best results on any instruction job. One of the chief distinctions between the good and the poor instructor is that the former knows how to select suitable methods and devices of instruction, and the latter does not.

The choice of a method in dealing with a given teaching problem must rest with the judgment of the instructor. While general rules may be given, they will not take the place of experience. An experienced workman usually does a better job than an apprentice. Although the apprentice may know all of the tools, operations, and machines, he does not possess experience in the use of them. Likewise with the instructor, through experience and instruction will come a sense of what to do, which will gradually develop into what has been called “the art of teaching.”

In choosing his teaching tools the instructor must decide whether he will use the telling, showing, or doing method, or a combination of these methods, and what devices he will use for the check-up step.

3. *Application step.*—It is a self-evident fact that we learn to do by doing. Manipulative skill is acquired by manipulative practice. Few people learn to swim by listening to a lecture on swimming. Before one can swim he has to get in the water and acquire certain habits of doing. By the same token our mental habits are acquired—by putting into practice what we have observed or have been told.

The application step permits the learner to try out the ideas he has acquired in step no. 2. It also gives the instructor an opportunity to observe the performance of the student

and to correct errors. Teaching continues, and the instructor should answer all questions pertaining to the lesson, and make further explicit explanations or demonstrations, but no information should be given which was not included in the presentation step. Every individual in the group should be given an opportunity to use the new information. It will be profitable for all students in the group, if the instructor carefully summarizes the main points of the lesson before taking the next step.

4. *Test or check-up step.*—In the fourth step each learner is given an assignment involving all of the new ideas, and is allowed to carry it out unaided. There is no supervision in this step. Here the learner is absolutely on his own. One or more learners usually fail to pass the test satisfactorily. This may be due to the fact that the learner's mind was not prepared to receive the new idea, or that the information was not given in the proper way, or that the content was over the learner's head, or possibly that the learner was inattentive and disinterested. Perhaps the lesson was not teachable. The lesson has not been taught unless the learner masters the information, and it becomes a part of his thinking and doing equipment.

What can be done if several of the group fail to pass the test or check-up? It will be necessary to repeat the lesson, but do not repeat the same lesson in the same way.

An analysis of the failure to reach certain learners must be made. "Know your learner" is an excellent slogan. You will then know how to reach him. Probably a new plan of procedure will have to be worked out. The mind should be prepared for the new information from another angle. The teaching points should be organized in a logical order with more detailed explanations. The learner may need more time to grasp the meaning of the instruction. The instructor should give more detailed supervision in the third step before going into the fourth step for the check-up.

Each lesson should be followed with another lesson built upon the previous one. It should always be kept in mind that teaching is a building process, and that each lesson

becomes a stone in the foundation. A lesson should not be a haphazard thing, as it is an essential part of the whole. Therefore, in planning, the instructor must visualize, not one lesson, but the interrelationship of all lessons in a unit of instruction.

The class-room lesson.—Teaching people to do things with their hands is not a difficult procedure, since things of a mechanical or manipulative nature can be uniformly analyzed, but inducing people to think through class-room instruction is a more difficult task. The following paragraphs deal specifically with the handling of class-room subjects. They not only discuss some of the ways of getting the learner to react or think in class, but also describe ways learners may be required to secure information for themselves for use in class-room lessons.

1. *Class-room procedures.*—Certain class-room procedures have been proved by experience to be sound. Among them may be noted the following:

(a) If one wants to train a youth to think, one should strive to cultivate in him two habits, two abilities, two kinds of resourcefulness:

(1) The ability to get and the habit of getting facts (ideas) when he needs them for any purpose. This habit will develop resourcefulness in searching for information which, as we shall see, may be for use in class, or in practice work, or both.

(2) The ability to think straight, and the habit of thinking straight with facts and ideas after he has gained them, to the end that he may do successfully a given job, whatever it may be.

NOTE.—Not all jobs are work jobs. In the course of instruction, a student may study and report on lessons; study and report on articles in trade journals; organize material for presentation in a notebook, or before a class; find the cause or causes which explain something; analyze in some systematic, logical way what he has read; summarize things he has been taught; learn some truth he did not know before; discuss or debate some question with others; draw conclusions; make decisions; plan class work; and check up the results of some figuring he has learned to do.

(b) If one wants a learner to remember a fact, it should be a fact which the learner can understand, and one worth

remembering because the learner can use it. Teaching should not be cluttered up with a lot of useless facts, for two reasons—first, they will soon be forgotten, and second, if remembered, they will be of no value. To teach them is therefore a waste of time.

(c) If one wants a student to remember something, one must realize that there is one best way of fixing anything in the mind. One must have the student make some use of the idea or principle to be remembered; have him do something with it. Moreover, it is essential that what he is to remember shall be tied up with something he already knows. This means that he must think about the new idea or principle until he understands it. He must use it, or see that it will be of some value for practical use in the future.

(d) These two abilities—*i. e.*, the ability to get facts, and the ability to use facts—will be of the highest possible value to the youth later in life. Only as he develops them can he fairly expect permanent employment as an indispensable employee in any occupation.

(e) The ability to think and resourcefulness in getting and using facts will be of great value to him in the other affairs of life also. If he is trained to get facts and to use facts for thinking straight, he will set up two methods, two habits which he will tend to use in other matters besides his job:

(1) A habit of stopping, looking, and listening—of getting the facts before tackling the job; of getting reliable information before making a decision or expressing an opinion.

(2) A method of thinking by systematic procedure in spotting the problem and analyzing it to find out what facts or ideas are needed to solve it.

(f) Manipulative skill in the performance of any job in a training program is of course necessary up to a reasonable standard. Repetition and practice for the purpose of developing a high degree of skill at the expense of training in understanding and resourcefulness is a mistake. The emphasis should be laid on thinking—on understanding. More and more in the industrial world purely manipulative skill in the novice tends to become of less importance, because the

next mechanical improvement may eliminate the need for any given skill. The highly skilled worker will of course always be in demand. But resourcefulness, ability, the habit developed by experience of thinking about matters in the trade is constantly becoming relatively more important.

(g) All these things make individual or group instruction a vital feature of any educational program.

2. *Experiences and devices for use in class work of various kinds.*—By an experience is meant that which the learner does—goes through. By device is meant the contrivance, plan, or scheme used by the instructor to help the learner go through the experience more easily. It may be anything from a demonstration model to a dictionary. Having a student read an article in a trade journal and report on it in the class is a definitely arranged experience, and the trade journal is the device used in giving him that experience.

(a) *Getting facts and ideas.*—Opportunities for this kind of experience are presented in every vocational class, as well as in classes dealing with such subjects as simple science, civic and industrial problems, mathematics, and English. It is not proposed here that learners shall search for all the facts and ideas they use in the class, but that they should get some experience in finding what they have occasion to use. They need such experience, and, valuable as it is, it cannot be given them fully, by simply furnishing them with predigested information sheets or other printed matter.

NOTE.—Some camps use much printed information. Information sheets certainly provide usable facts and ideas to the learner, but may deprive him of the experience he needs in searching for facts and ideas for himself. Some opportunity for gaining such experience should be provided

(b) *Experiences.*—These are so varied that it is not possible to make any even approximately complete list of different types of possible experiences. However, the following may serve as a suggestive list:

(1) *Studying a lesson* on instruction or information to get ready for recitation.

(2) *Making reports in class* which require reading or a search for facts. In the English class, to illustrate, a student

may be assigned to review an article in a trade journal, or be required to select the article for review. His report may be oral or in writing.

(3) *Preparing an assigned lesson from a book* where a book is used for reference.

(4) *Running down the answers to questions* asked by the instructor, to gain practice in looking up facts.

(5) *Reading trade publications* in order to select an article from which to select the facts and ideas upon which to make a report.

(6) *Consulting the references* for additional or supplementary data, or for the purpose of gaining a further understanding of the subject treated in an instruction sheet or an information sheet.

(7) *Visiting a plant or project* for the purpose of getting an understanding of the way an occupation is practiced commercially, or a particular process is carried on. Sometimes, at least, this is followed by an oral or written report that calls for a selection and organization of facts to be presented.

(8) *Getting facts, ideas, opinions, and conflicting points of view from other students* through class discussion, and from personal interview with a student or students.

(9) *Learning from the demonstration* conducted by the instructor before the class a truth or the explanation of something, or the way to do something.

(10) *Correcting false information or ideas* in class discussion, or by having mistakes corrected by the instructor in the notebook, in the oral or written report, or in the recitation.

(11) *Reviewing for class tests* material such as is found in notebooks, lesson sheets, trade journals, catalogs, and encyclopedias.

(12) *Asking questions of the instructor* when the learner does not understand or wants additional information for any reason.

(13) *Learning how to use a new formula* by substituting quantities and solving an equation.

(14) *Getting facts and ideas from analyzing teaching devices*, such as cut-away parts, diagrams, photographs, still pictures, and motion pictures.

(c) *Devices*.—Among the innumerable devices that may be used in class work to induce students to get information for themselves are the following:

(1) *The dictionary* to find the correct spelling, meaning, or pronunciation of words.

(2) *The encyclopedia* to get information on any subject.

(3) *The trade journals* to read and report on some trade or technical subject.

(4) *Magazines* of the Popular Science Monthly and Popular Mechanics type.

(5) *Trade knowledge lesson sheets* for study in preparation for a class lesson—*i. e.*, sheets furnishing information applying to a specific trade, used in many vocational schools.

(6) *Shop knowledge lesson sheets* for the same purpose—*i. e.*, sheets furnishing information applying to shop jobs, used in many vocational schools.

(7) *Reference books* of all kinds, including handbooks containing specific information for the occupation, which students can be required to read in connection with their lesson preparation or for special discussion of any point.

(8) *Manufacturers' catalogs* for each trade, giving information about machines, tools, operation, cautions, difficulties, remedies, tables, and graphs, to be used in connection with shop jobs or with classroom problems.

(9) *The notebook* for taking notes, recording facts, and writing up summaries, analyses, and reports

(10) *Questions* which challenge the interest of learners and cause them to search for facts and ideas, or which require them to look up answers.

Student Records

1. *Class record*.—It is necessary that some record of attendance be kept of all classes. Some instructors prefer to take the roll at the beginning of the class, others at the close. In most cases it makes very little difference just when the roll call is taken. A record should be kept, however, of those who are tardy and of any who may leave early. A roll-call book, a chart, a sheet of paper, or almost any form or device

can be used for recording attendance—including absences, tardiness, and the like—but whatever the form in which the record is kept, the record should be kept systematically and accurately. A record is worth nothing unless it is true and accurate.

2. *Progress chart.*—In recording the progress of students, particularly in connection with manipulative practices or work jobs, some chart or form should be used. This is particularly true where students are permitted to enter a class after it has been started and several lessons have been conducted. There are any number of forms which can be used for this purpose. The following chart has proved an efficient device. It is set up here in condensed form to save space. In common use, it may be any size desired, usually 12 inches wide by 16 inches long. Many instructors rule up one or two forms to suit themselves, on sheets of paper or cardboard suitable for the purpose.

Chapter 5 ★ Teaching Learners to Think

THE importance of learning to think cannot be overestimated. For no person is this more true than for the worker who must adapt himself to constantly and rapidly changing conditions and demands. This applies particularly to C. C. C. camp enrollees. Skill of hand is still necessary and important, but the ability to get, know, and use facts in doing work is becoming increasingly important.

The mind builds its own processes, its own way of handling itself. It is a mental switchboard that wires itself through experiences. It establishes its own bonds, its own connections which we here call habits of thinking and doing. Habits are acquired only by practice. No practice, no habits. Wrong practices, wrong habits. Habits are much more easy to learn than to unlearn. The vital thing is to develop correct habits of doing and thinking. Like all other people, C. C. C. enrollees may have developed bad habits of thinking. The most important problem for the instructor is to displace bad habits of thinking and doing by substituting good habits.

The way we think.—There is one practical way of thinking for those who would get along in the world. The steps in this way of thinking may be indicated as follows:

1. Spot the problem to be solved, the job to be done, or situation to be met.
2. Analyze the problem to determine the facts that count. (The facts you must know and use in order to think straight about the matter.)
3. Take stock of those functioning facts that are already known.
4. Get the functioning facts that are not known.

5. Put all these functioning facts together as a kit of usable facts for solving the problem. (They constitute the thinking stuff.)

6. Mull this thinking stuff (usable facts) through your mind; comparing, contrasting, weighing, rejecting, accepting.

7. Arrive at a decision or a series of decisions about the problem or question.

8. Organize these decisions into a plan, if the problem goes beyond step no. 7.

9. Put over that plan.

10. Inspect the work after it is done to see the results. If the results are correct, the facts were correct, and adequate, and the thinking was sound. If the results are bad, either the thinking was not sound or the facts were incorrect, or important functioning facts were omitted in the thinking.

When a learner thinks.—He thinks when he is so managed by the instructor that he goes through one or more of the following experiences:

1. He carries out instructions accurately, as when he performs a new operation or process by following the directions on a detailed job sheet.

2. He interprets what others say or write, as when he reads reference material.

3. He explains the reason for things (the why), as when he gives the instructor the explanation for some statement made by either the instructor or himself.

4. He explains a way to do a thing (the how), as when he describes a piece of work he has done in his notebook.

5. He searches for the facts or ideas he needs to do something, as when he looks in a handbook for the correct formula or information to use.

6. He organizes information, as when in the class room he gives a review of an article in a magazine.

7. He systematizes his work, as when he lays out his tools and materials in an orderly way.

8. He analyzes things, as when he prepares from a blueprint or specification a check sheet showing tools, materials, and steps for a given job.

9. He draws conclusions, as when he performs an experiment and gets an answer.

10. He makes decisions, as when he decides to connect lights in series or multiple, or some combination of the two, on a circuit with a given voltage in order to get the best results in candlepower.

11. He makes a plan for doing something, as when he is asked to write out a program for doing a given job from a blueprint or specifications.

12. He executes a plan for doing something, as when he carries out the program he sets up in no. 11 above.

13. He checks the results of his own work or that of others, as when he is required to inspect the job he has done before presenting it to the instructor.

14. He tries to locate the cause of anything, as when he trouble-shoots a job in auto electric work to find what keeps an automobile engine from working as it should.

15. He teaches others to do something, as when a student who has learned some process teaches it to another, or when one student becomes responsible for others, on a gang job.

Suppose we take no. 14 above for further illustration. The student searches for the trouble that keeps something from working correctly. What does this have to do with the thinking process as discussed above? First of all he spots the problem. It is to learn, let us say, the reason that a given automobile will not pick up on a hill but loses power rapidly. From his previous instruction, the student has learned that this happening may result from any one of a half dozen causes. Only one of them, let us say, is the real cause. These six causes are facts or ideas which he already has that he must use in checking on the car. The other facts he must get. They have to do either with the way the automobile acts as he checks its actions against one after the other of the known possible causes of the trouble, or with the way the auto acts when any one of the possible causes is remedied. To illustrate, the carburetor is adjusted, but the car may still lose headway on the hill.

All these facts and ideas, when put together, constitute his kit of thinking stuff for the job. He thinks through the

possible causes, car behavior, effect of this, that, or the other trial remedy, until he arrives at a decision or decisions regarding the cause of the trouble with the car. From this, such a plan as would be necessary to remedy the trouble would naturally follow.

One thing above all others to be remembered is that students learn to think by thinking, each for himself, not by merely watching an instructor think or by listening to him talk. Habits are generated, developed, and fixed only by the practice of the learner. At best, all the instructor can do is to control the experience which requires the learner to think for himself. He who does this best is, beyond all question, the most efficient and therefore the most valuable instructor.

The use of the question as a thinking device.—The question can be used for many different purposes by the instructor, not all of which have to do primarily with thinking. Among these may be noted the following:

1. *For the purpose of creating interest in the subject under discussion.*—The instructor is teaching the law of falling bodies and asks this question, "Which is the easier to catch, a high fly or a pop fly?" The answer being a pop fly, the teacher continues, "The purpose of this lesson is to find out why that is true."

2. *For the purpose of recalling a fact needed at the time in teaching.*—In a class in automotive electrical work, for example, the instructor wants to emphasize the fact that batteries can be damaged by charging at an excessive rate. He asks, "What is the effect on a storage battery if it is charged at a rate too high for its condition?"

3. *For the purpose of reviewing the pertinent points in the last lesson as preparation for step 1 of the new lesson.*—He may say, "What were the important things we learned in our last lesson?" and set the important answers down on the blackboard. In the last lesson he taught that gravity accelerates the falling body and retards the rising body. Today he asks, "What is the path of a ball thrown from A to B through the air?" When he is told that this path is a curve because the ball first rises and then descends due to gravity, he says,

"The purpose of this lesson is to find the cause for the ball not following a straight path."

4. *For the purpose of learning whether the student understands instructions that have been given him for doing something.*—After giving instructions, the teacher pauses and then says, "Jim, what is it you are to do?"

5. *For the purpose of finding whether the students understand how to do a given job or perform a given process.*—After showing the way in which one fraction is divided by another the teacher says, "How do you proceed in dividing one fraction by another?"

6. *For the purpose of finding whether the student understands the cause of something.*—The teacher says, "We have demonstrated that the front wheels of an auto are both turned in. Why is this done?"

7. *For the purpose of making the student reason from cause to effect.*—A student of carpentry is taking a slow stroke with the saw. The instructor asks him, "What would be the effect if you doubled the speed of the stroke?"

8. *For the purpose of correcting a learner's misunderstanding of something.*—In mixing electrolyte for storage batteries, the pupil says that water should be added to the acid. Thereupon, the instructor asks, "Is there any danger in mixing it that way?"

9. *For the purpose of causing a student to analyze the steps in the performance of a given job.*—He is asked by the instructor to describe the steps involved in the removing of the right front tire of a Ford V-8.

10. *For the purpose of causing a learner to plan his handling of a given job properly.*—The instructor asks him, "What is to be done?" "What parts are needed?" "What approximate time is required?"

11. *For the purpose of causing a learner to answer his own question.*—This is sometimes called the "old Scotch game" of answering a question by asking another. A learner in baking produces a loaf of bread which is off color. Unable to account for the trouble, he asks the instructor, "What is wrong?" Instead of answering directly, the instructor says, "What are the possible causes of the trouble?" The learner

answers by giving a few causes and saying that he has checked them. The instructor says, "There are other causes, what are they?" The learner does not know; thereupon, the instructor refers him to sources of information in references and asks him to make a list of other possible causes and to check them against the trouble.

12. *For the purpose of stimulating the class to get important facts for themselves.*—The instructor asks a question which no one can answer. He says, "You had better look it up as it is important."

13. *For the purpose of testing at the close of a lesson whether the instructor has put over what he has tried to teach.*—He has tried to teach a group of auto mechanics how to read the micrometer. He draws on the board the "mike" and its markings. He indicates certain marks and asks a member of the class to read it by saying, "What is the reading?" By changing the markings and repeating the question, he soon learns whether the class can read the micrometer. He checks them by having them set a real micrometer for him.

14. *For the purpose of developing a lesson from the knowledge possessed by the learners and not from what the instructor knows.*—By skillful questioning the class is led to teach itself. In the experimental kitchen, the class in bread baking has gone through the experiment of baking three loaves of bread—a standard loaf with the proper amount of salt, a second loaf without salt, and third loaf containing too much salt. On the basis of this experience, the instructor asks such questions as these: "What effect does too much salt have on the volume of the loaf? Too little salt? What effect does too much salt have on the color? Too little salt? What effect does too much salt have on the texture? Too little salt?" By writing the correct answers of the students on the blackboard, the after-results of varied amounts of salt are made plain to the students.

15. *For the purpose of summarizing, by way of review, the main points brought out in a lesson.*—In an auto class the subject of lubrication has been discussed, and the differences in the kinds of lubricating oils have been pointed out. The instructor asks, "What were the different oils used?" and he

lists them on the blackboard as they are named to him by the learners. He may in a second column list the reasons each oil is used. This is an application of the conference procedure.

16. *For the purpose of providing additional work for the more capable or industrious members of the class.*—As an illustration, students are induced to volunteer for additional assignments. In the auto shop, the construction and operation of a model A ignition system has been gone over thoroughly. The instructor asks this question: "How is the model B ignition system constructed and how does it work? Compare with the model A we have been discussing. Who will volunteer to bring a diagram and an explanation of model B?"

17. *For the purpose of carrying class discussion over the "dead point" so as to get it moving again.*—The instructor should be a director and a manager of discussion by the class, occasionally furnishing statements or suggestive questions to clarify particular points or to keep the discussion from dying out. In a class in forestry there has been a discussion of how to put out a forest fire, and two students have differed on a point. The progress of the lesson has been stopped. The instructor asks what would be the results from following both methods and lists in one column the results if A's method is followed, and in another column the results if B's method is chosen, and then the class helps decide which is most effective.

18. *For the purpose of getting the attention of an inattentive student.*—By suddenly asking a question and calling on him to answer. This is sometimes good strategy.

19. *For the purpose of correcting errors—not merely for detecting them.*—In questioning students in a class, question for the purpose of correcting errors and not for the purpose of detecting them. The discovery of errors, has some value, but it is the correction of them that produces results.

20. *For the purpose of causing each student to formulate the answer in his mind before anyone is asked to give it.*—Who is to answer the question should not be indicated by mention of a name, or by motion or glance, until after the question has been asked. This procedure sets up four steps: (1) Stating question; (2) pausing; (3) calling on student to answer; (4) answering by student or passing question to

another student. This method tends to cause every member of the class to think about the question since he does not know whether he or some one else will be called upon to answer it. We learn in proportion as we are able to think. A good instructor causes his pupils to think.

Characteristics of a good question.—Questions should be asked very plainly and distinctly in order that every student may hear them and know their meaning. After the question has been put, it should not be repeated for the sake of those who did not get it the first time. A good teacher makes it a point to hold the attention of every student. However, if he fails in this respect, he may then be expected to repeat questions for the sake of those who are not paying strict attention.

Repeating questions for the benefit of inattentive students helps develop an attitude of indifference on the part of students, and the efficiency of the class is lowered. No instructor should fail, however, to repeat a question or restate it for the sake of making it clear to members of the class.

Questions should be understood by the learner. To this end the student should be expected and encouraged, when he does not understand, to say so and ask for a further explanation.

Questions should be stated so that they can be interpreted in but one way.

Questions should be thought provoking, and not such as can be answered by yes or no.

Questioning students in rotation automatically reduces the amount of thinking done by individuals in the class. This method indicates who is to answer the next question and shows a weakness on the part of the instructor. The more successful instructor makes it a point to learn the names of the students early in the course, thereby making it possible for him to call on them by names, and putting himself on a much more personal basis with every student. Knowing the members of the class also makes it possible to fit questions to individuals—the more difficult questions for the brighter students, and the less difficult ones for the backward students. Answers to questions furnish information for all members of the class.

Chapter 6 ★ *Planning for Efficiency in Teaching*

PLANNING a lesson: In the instructional outlines prepared by the committee for use in C. C. C. camp instruction, referred to in the Foreword, the first lesson of each unit course sets up points commonly covered by instructors in introductory lessons—the object of the course, the hour and place of meeting, use of notebooks, records to be kept, conditions under which certificates are to be awarded, selling the course to the class, rules and regulations, presentation of material, check-up questions and assignments. In this chapter additional matters are to be considered which have to do with the planning of lessons.

The lesson plan is the instructor's blueprint of the teaching job to be done. It is used by the instructor, not the learner. The instructor thinks the lesson through and organizes it on paper. In doing so, he must determine the answers to such questions as:

1. Is it to be a technical or practice lesson?
2. What is the objective of the lesson?
3. Can testing be done to help determine whether the learner got the new idea?
4. Can the learners apply or practice the new idea?
5. What are the teaching points and what is the order in which they are to be arranged?
6. What teaching methods, equipment, and devices are needed for the lesson?
7. What can be done to prepare the learner for the lesson?
8. Are there any analyses or plans available through the United States Office of Education or other agencies which will aid me in my work?

The answers to these questions must be secured as a guide to the preparation of a usable plan for teaching purposes. The accompanying blank form of a lesson plan provides

headings under which the lesson plan is developed. Samples of these forms will be found in the instructional outlines which have been prepared by the committee.

Lesson plan

Course: _____ Unit No.: _____

Lesson No.: _____ Date to be taught: _____

Lesson Topic: _____

- I. Object of this Lesson:
- II. Teaching Devices:
- III. Procedure (Teaching Points):
- IV. Questions (Test or Check-up):
- V. Assignments:
- VI. References:
- VII. Comments:

Planning for equipment and teaching devices.—Illustration and demonstration equipment is seldom available at all times in any of the camps. One way to avoid delay in securing such equipment and to increase the efficiency of the teaching job is to plan far enough in advance for all equipment and teaching devices, to make sure of having things ready for use when needed.

The following condensed planning form is suggested here as a possible form for use in securing and scheduling teaching devices and supplies. By listing what is needed on the form, it is made possible for those in charge to arrange to have the listed equipment on hand when needed.

Planning form for teaching devices and supplies

Lesson no.	What is needed	Date needed	Where it may be had	Check (X) when arrangements are completed

Planning for shop and field trips.—Whatever equipment for demonstration and practice is available in the C. C. C. camp, it will be of advantage to the enrollees to be taken to shops or into the field for the purpose of inspecting something that has been done or matching something that is being done. If these trips are to be of maximum value to the enrollees, they must be scheduled and planned so that each trip may be made as closely as possible to the lesson which most nearly ties up with the work that is to be witnessed on the trip. No form for scheduling such trips is suggested here. They can, however, be scheduled on the planning form suggested for scheduling teaching devices and supplies.

Planning for the management of the physical set-up.—The instructor manages things, and he also manages human beings. We are here concerned with the former. Among the long list of things he manages on the job or in the classroom are the following: Light, heat, ventilation, seating, blackboards, tools, machines, demonstration material, charts, diagrams, job sheets, lesson sheets, information sheets, progress charts, records, reports, reference material, textbooks, and the like. He has the primary responsibility of organizing and handling these things so as to get the best possible results in teaching—to avoid learning difficulties because of the mismanagement of these things.

Management means control. Management by guess does not give effective control since it is not based on systematic, intelligent planning. The responsibility of the manager of anything centers around planning, and that planning has in it at least four easily recognized duties:

1. The duty of planning a thing in advance.
2. The duty of putting over that plan, either himself or through subordinates.
3. The duty of checking up the results of the plan.
4. The duty of correcting mistakes in the plan, in the light of results.

Planning for the management of human beings.—Here again the instructor is a planner, or should be. What is his plan or general policy for dealing with his learners man to man? Should he attempt to be a ruler or a friendly helper? Should he appeal to learners for observance of rules, or threaten them? Should he have many or few rules? What rules should he have? Should he have certain fixed standards of conduct, or have none? Should he discipline publicly or privately? Should he handle all learners in the same way, or vary his treatment according to the individual? How much time should be given to the study of individual learners? Should he use competition, interest, or force as the main device in getting learners to work, and whichever device he uses, what should be his plan for using it? How much of an "open door" should he keep for the personal troubles of learners outside of regular class or work periods?

When a general plan, or a plan covering any one or more questions such as have just been formulated, is contemplated, the procedure followed will of course also go through the four steps of:

1. Making the plan.
2. Putting it into effect.
3. Checking the results.
4. Changing the plan where necessary.

Planning as a manager of instruction.—As a manager of a physical set-up, the instructor plans and executes his plan concerning the use of light, tools, reference material, and records. As a manager of human beings, he plans and

executes his plans for dealing with learners in his human relations with them. As an instructor, he plans and executes his plan for giving them instruction to develop skill or knowledge, so that they will understand, and make progress in their ability to think, or perform, or do both. Teaching, or giving instruction, after all, is only the execution of a process which has been planned or should have been planned in advance.

So the instructor plans for his instructional work. What is the purpose of the course? What content does he need to fulfill the purpose? In what order shall he present the various topics? What equipment does he need for this, that, or the other instructional task? What recognized teaching methods shall he use? What teaching devices shall he employ? By what methods shall he check up the results of his instruction? What methods or devices shall he use to create and maintain interest in the work? What are the learning difficulties, due to the instructor, that need to be anticipated and prevented? What are the learning difficulties in the subject matter itself, which require special care and planning? What are the learning difficulties that need to be forecast and provided against? What are sound rules in class or work-job management of the instructional process that need to be constantly followed? What policies and devices should be used with learners who fail to make satisfactory progress in the work? How does the lesson fit into the general purpose of the course? How much review should he give to help the slow learners, and how much to check up the results of the instructor's own work? How can he get learners to think for themselves, instead of trying to memorize information? How much shall he "cut the corners" to save time, rather than really teach the lesson or have learners work things out for themselves in class or on the job?

Through observing good practices and by constantly making an effort to do a better job of planning, the instructor eventually becomes an efficient worker in the teaching profession.

Chapter 7 ★ Success Factors of an Educational Program

A CIVILIAN Conservation Corps educational program of the voluntary type will probably be successful and worth while in proportion as:

1. It offers its learners instruction which they want or need which will be of real value to them, and which will be usable after they have completed the course.

2. It develops in the enrollees a desire to take additional courses.

3. It provides a satisfactory educational service for the enrollees.

4. It conducts an effective service at a reasonable cost with respect to time, money, and effort.

In the following pages are discussed some of the factors which enter into the successful operation of Civilian Conservation Corps camp educational programs.

1. *Efficient organization of the program.*—Those responsible in any way for the educational program should know and fully understand what their responsibilities are and what authority they have in connection with these responsibilities. Instructors should learn, before starting to teach, to whom they are responsible and the authority which they have in the carrying out of these responsibilities. They should then plan for their teaching to conform to the prevailing requirements.

2. *Cooperation.*—The Civilian Conservation Corps camps are endeavoring to operate on an efficient and business-like basis. Cooperation is needed to conserve the time of both the instructor and the learners. The instructor should study the teaching job for the purpose of increasing his efficiency; study the operation of his work for the purpose of cutting the cost; make an endeavor to reduce the cost of supplies used; promote economy in the use of power, light,

and other facilities; and insist that the students conform generally to standards of economy and practice similar to those observed in modern industry. They are being trained to meet the requirements of a job; therefore, it is essential that they conform to reasonable standards in the educational program.

Selling the service of the educational program is one of the cooperative responsibilities of the instructor. He should be loyal to the camp, and at the proper time and place, put in a good word for it. Industry expects every employee to be interested in the welfare of the business; likewise, the camp commander and educational adviser expect every member of the staff to work toward the best interests of the program. Those who carry a grouch or ill will toward the management are usually the losers and invariably unhappy. When the instructor has a suggestion for the improvement of the service, he should tell his superior about it. It may mean promotion for him or the saving of dollars for the camp. By boosting the educational program, he boosts himself. By "knocking" the program, he acknowledges that he is in part responsible for any deficiencies noted.

3. *Promptness of instructor.*—The instructor who is on the job ahead of the time the class is scheduled to begin, and who arranges his work ready for the class, may expect to find his students also getting to class ahead of time or at least on time. The instructor who reaches his classroom "on the dot" or occasionally a few minutes late, may expect to find students coming in late, as they naturally assume the attitude: "Well, the instructor will not be there, why should I get there on time?" Although the courses are not conducted primarily for the purpose of training in promptness, the importance of a good example on the part of the instructor should be recognized. Establishing the habit of being prompt in getting to class helps to develop the habit of getting to the daily job on time.

4. *Prompt dismissal of class.*—After the class schedule has once been established, students should not be kept beyond the agreed time, except by consent of the class. The en-

thusiastic instructor is inclined to forget that students have other responsibilities and that they hesitate to leave the class at the pre-arranged time, although it may be necessary for them to go. There may be, of course, exceptions which may make it advisable to continue the class beyond the scheduled time, but this should be avoided whenever possible, particularly if the extension in time is brought about through students asking questions. If the questions are of an individual character, it is best to dismiss the class at the regular scheduled time and ask those who have special questions to remain for such help as they may need.

5. *Proper classroom conditions.*—Ventilation and temperature play an important part in connection with the comfort of learners. A room that is too cold causes discomfort, and a room that is too warm may not only be uncomfortable, but may bring on drowsiness. Fresh air is necessary, not only for efficient teaching, but also for good health.

Another factor which influences the comfort of students is the manner in which they sit. They should be encouraged to sit in an upright position with the spinal column against the back of the chair.

In rooms where no provision is made for the circulation of air, instructors should see that windows are open to the point where sufficient ventilation will be secured, or that the doors are opened at necessary intervals to give a change of air. Students think more clearly when the classroom is properly ventilated, and when the temperature is maintained at or about 70° F. Drafts should of course be avoided.

6. *Clean blackboards.*—The instructor who attempts to teach a lesson in a room where the blackboards are covered with charts, problems, announcements, writing, and the like left by the instructor of another class, may experience difficulty in holding the attention of the students. Whenever possible, all blackboards should be free of such material and all other objects should be removed which may distract the attention of the class. At the close of each class, all drawings and writing should be removed from the blackboard.

7. *Freedom from outside disturbances.*—It is a mistake to leave doors ajar which open into halls or places where things

are happening which may distract the attention of students. If a door must be left open, it should be opened no wider than is necessary for ventilation. The operation of machinery close by may make it difficult for all class members to hear distinctly. Therefore shut out, if possible, all unnecessary noises.

8. *Reading to class.*—The instructor who persists in reading to his class is not only misusing the time of the students, but is wasting his own efforts. Most students can read; let them do their reading outside of class hours. The instructor should likewise do his reading away from the class and not attempt to prepare his questions and teaching points during the class period. The lesson should be handed out, the chapter assignments in the textbook made, or the special problem or problems given before the time for discussion. There may be special parts of a lesson or a chapter in a book which are of sufficient importance to make it desirable to read them aloud to the class, but cases of this kind are the exception rather than the rule.

9. *Instructor standing while teaching.*—There seems to be considerable difference of opinion as to the efficiency of teaching when an instructor sits while presenting a lesson as compared with presentation of the same lesson by him while standing. Sitting while teaching has been a common practice in lecturing and reading lesson material. More progressive educators are, however, agreed that an instructor who is on his feet is better able than he would be if sitting to demonstrate equipment, to illustrate on the blackboard, to emphasize his points, to direct his remarks toward students who may be showing a lack of interest, and in general, to perform efficiently as an instructor.

Observation of instructors who sit while attempting to teach, indicates that some of the students at least, must sit in uncomfortable positions in order to see what is going on. Students who attend evening classes have usually put in the regular hours of the day at work, and are therefore deserving of consideration as to their comfort. The instructor who stands recognizes these conditions. There may be excep-

tions, but as a general rule the "sitting teacher" is a lazy and inefficient teacher.

10. *Encouragement of students to do better work.*—It is a mistake for an instructor to fail to check each assignment or piece of work the student does and to comment upon the accuracy, neatness, and grade of work. The student should be encouraged to put forth his best efforts, even though he has done a poor job, because he is in the class to learn, and it is the instructor's job to teach him the things that he does not know and cannot do.

11. *Individual recitation.*—Chorus recitation makes it possible for students who do not know the answer to questions to "get by" without giving the instructor a chance to check up on what they know. A good instructor asks individuals questions rather than the class—at least he does not direct all questions to the class. The questions should not be put in such a manner as to encourage group recitation. There are times when volunteer answers may be accepted, but only under the control of the instructor.

12. *Understandable language.*—Tradesmen are familiar with trade terms, but may have difficulty in understanding big words. When a technical expression is first used, it should be explained as accurately as possible in trade terms. The instructor who attempts to employ big words in teaching trade subjects is usually rated by tradesmen as a "swell head" or a "theoretical bird."

13. *Proper presentation of subjects.*—Before condemning a class for failing to understand the lesson under discussion, it is advisable for the instructor to check himself and determine whether or not he has presented the subject in a thorough and efficient manner. The wrong method may have been used, the lesson may not have been suitable for the group, or the preparatory step may not have been completed. Failure to put over lessons should be analyzed in order to determine, if possible, what is wrong. It may be that the lesson is given at the wrong time, but whatever the reason is, it should be detected and the same mistakes should not be made again.

14. *Impartiality.*—The more intelligent students in a class are usually better able to take care of themselves than the less fortunate ones. Present the material for the benefit of the normal students as well as the bright ones. The bright students may mislead the instructor into believing he is doing a good job of teaching, when in reality the remainder of the class may be failing to get the ideas. There should be work for all students. The more advanced students should be used to help others, but playing favorites is to be avoided.

15. *Even temper and tact as teaching assets.*—The instructor who loses his head, shows anger, or argues with his students in class, shows poor judgment. He should maintain his dignity as an instructor at all times. He is supposed to know more about the subject than his students, and when he starts an argument with a student, before other members of the class, he may appear to take unfair advantage of his position and lose the respect of the class. By controlling his temper, by being not too positive on all points, and by tactfully sidestepping open arguments until he can get the facts, he can usually avoid criticism.

16. *Answering all pertinent questions.*—Failure by an instructor to give a reasonable answer to a student's question creates dissatisfaction. If the correct answer cannot be given at the time, it is much better to say "I don't know but will look it up," than to bluff. Questions that do not deal with the subject at hand may have to be carried over to some future lesson or time. By requesting that such questions be written out and handed in, the instructor can provide the definite information for the student whenever it is advisable to give it to him. However, if the question indicates an urgent need for the information, the instructor should give him the information after the class period if possible. He should not permit himself to be diverted from the subject in hand by attempting to answer questions which are not pertinent to the subject under discussion, even though the discussion may be of interest to the entire class.

17. *Clear-cut and adequate directions.*—In teaching manipulative work, it is a mistake to leave a student before he

thoroughly understands what he is to do. The instructor may want to let him think about how he is to do the job, but there should be no question in his mind as to what the job is. Job sheets on the "what to do" help speed up the job training. Instruction sheets or the "how to do" sheets are also of value when properly used.

18. *Proper use of tools and machines.*—It is a mistake to fail to explain fully (teach) the operation or use of a piece of equipment or tool. If the use of the tool or machine is not fully explained, there is danger of breakage and loss to the camp, as well as a loss of time to the learner. The experimental method is too costly where expensive tools and machines are involved.

19. *Getting along with the boss.*—An instructor displays a weakness when he resents taking orders from his superior (the boss). The superior may not always be right, but he is paid for looking after what is done. If the instructor does not agree with his views, he should be big enough to go to him and tell him so. It is usually a very narrow boss who does not respect an honest, straightforward individual. A willingness to help him should be shown by discussing differences in viewpoints with him before talking to others.

It is folly to fail to get along with the boss. Constructive work is impossible when harmonious relations do not exist.

It is a mistake to fail to comply with orders and requests received from superiors. There is usually a good reason for every order sent. Orders should receive prompt attention. Failure to observe orders may mean a great loss of time and money. Course records and reports are needed for the completion of final reports and records. It is wise to comply with all requests sent or explain to the proper authority just why it is not possible to comply as requested.

Every organization must have its rules and regulations—each instructor has a set for the students, and he expects the students to follow them. Whenever the instructor knows and understands the rules and regulations of the educational program, he should follow them. If he thinks they are unsound, he should explain his reasons to his superior.

Do what is expected, and a little bit more. It's the "little bit more" that gets results.

20. *Use of good English.*—Students' answers to oral questions should be sufficiently complete to be of value to all members of the class. In some cases, a complete statement is necessary for clearness. Answers should always be sufficiently complete to develop in the student the ability to express himself.

However, no instructor teaching trade subjects should consider himself a teacher of English, or spend time requiring the student to give complete answers to questions when the time might better be spent in dealing with usable information for the class. Written answers to questions, of course, should be more detailed and complete than oral ones. The use of good English on the part of an instructor will help students who are attempting to improve their use of English.

21. *Aiding the slow learner.*—In every class there are some students who need individual instruction. This may be in the form of suggestions as to what to study, help with a certain problem or assignment, or a private lesson of only a few minutes to help the learner think for himself. The normal individual usually can proceed under his own power. It is the less fortunate that need the added assistance. Too often the instructor is of the opinion that the slow student is not worth bothering with. Possibly a few minutes with him, to give him the much needed help, will be worth much more to him than the same amount of time given to a normal individual. Individual instruction is necessary.

22. *Aiding the rapid learner.*—The rapid learner is an individual who, because of his native ability, training, or experience, can progress much more rapidly than the average individual. Sometimes these young men present a problem for the instructor. One way to handle this type of learner is to give him a task which will fit his degree of ability. It may be a larger assignment or a special problem. He may also be used as an assistant class leader. Certainly, something should be done to make use of this excess energy and keen desire to learn. Individual assignments and special reference readings help solve the problem.

23. *Class instruction applied to camp projects.*—Too often the opportunity of tying up the instruction offered in the camp with the daily work of the enrollee is ignored. The class instruction can best be coordinated with camp work projects when the students in a course are grouped under one foreman.

The foreman on the job in many instances is the instructor, and is only too willing to help with making the training of these young men of the greatest possible value. This procedure is being successfully followed in several Corps areas.

24. *Regularity of attendance.*—Tardiness in a majority of cases is due, in part at least, to lax management on the part of the instructor. If each lesson is so planned that there is something worth while presented in it and the instructor is prompt in getting on the teaching job, the enrollee will be anxious to attend class regularly so that he will not miss something worth while. Certificates awarded to those who have satisfactory attendance records are motivating devices.

25. *Properly selected references.*—Since the number of reference books in the camps is limited it is necessary for instructors to select reference reading material with great care. References should always be selected on the basis of their direct application to the lessons under consideration. Too often the textbook or reference material selected is too far advanced for the enrollee. When he does not understand what he is reading, he has little or no interest in it. When he understands what he is reading and can see the usability of it, he will study more faithfully.

26. *Making students feel at ease.*—Inasmuch as many Civilian Conservation Corps enrollees are not accustomed to formal instruction, teachers should be especially careful to keep their meetings informal. Ridicule of individuals because of mistakes should be discouraged.

27. *Avoiding repetition of students' answers.*—To repeat every answer given by students is usually a waste of time. Students in answering questions should be encouraged to speak distinctly and give each answer in such a manner that every member of the class can hear it. This saves time

and develops in the student the ability to give his answer clearly and concisely. There are times, however, particularly with large groups, as when some noise has prevented the entire class from hearing, it may be necessary to repeat the answer, provided it is of sufficient importance to warrant emphasis.

28. *Teaching the student how to study.*—The average instructor often neglects to give the learner needed assistance or suggestions regarding how to study. The following suggestions are offered here in the hope that some of them will be passed on to the learner. Studying here means the inspection of reference material regarding the lesson and writing up reports of anything done outside of the class in connection with reference material.

(a) Whenever possible, study in a quiet place.

(b) The temperature should be comfortable. Probably not less than 68° nor more than 72° F.

(c) Avoid studying in an unventilated room.

(d) Get sufficient light on the work, whatever it may be. Too much light is as hard on the eyes as too little. If possible, have the light strike the reference material over the left shoulder. Avoid reflection of light in the eyes from the printed page or similar reflecting surfaces.

(e) Arrange to study and get the habit of studying in the same place and at the same hour of the day if possible.

(f) Get a comfortable chair, but not a reclining one. To keep alert, sit upright at a table or desk and have the spine as straight as possible.

(g) When tired of the subject, take a short rest. Get a drink of water and do something else for a while to relieve the tension.

(h) When studying must be done in noisy places or where others are moving about, practice fixing your attention upon your work and study. Develop the habit of studying under any conditions which, although not entirely favorable, cannot be controlled or avoided. Others learn to do it; you can too.

(i) If there is any indication of eye strain, headaches, etc., inspect the light conditions and see an oculist. Wear glasses if necessary.

The instructor can motivate the outside study of students through the careful selection of assignments and by not giving too much to study at one time. When making an assignment, select subjects of a usable type so that the learners will be able to see how they connect up with the lesson. Outside study does not necessarily mean in all cases studying a book or other printed material. It can be the studying of diagrams, charts, equipment, a project, or anything which is usable in connection with the course which is being taught.

29. *Constructing teaching devices*.—The resourceful instructor finds many ways in which he can secure or construct ingenious devices for teaching purposes. Sometimes the most crudely constructed device has a greater teaching value than the highly polished or most expertly made piece of equipment. There are all sorts of simple teaching devices which can be constructed in the Civilian Conservation Corps camps by the instructor or by some of his enrollees. For example, a few boards with dirt placed on them to demonstrate the process of soil erosion is a simple and inexpensive device which can be constructed. Small models of forests, and model bridges, also can be made use of in the classes.

Chapter 8 ★ *Learning Difficulties of Students*

A **LEARNING** difficulty is anything which in any way makes it difficult for a student to learn.

Learning difficulties as described here are considered under three general headings: Personal, Camp, and Instructor difficulties.

Personal Difficulties

Personal difficulties are those of a personal nature under the control of the enrollee. They are individual and most of them, through proper teaching and handling, can be almost entirely removed.

1. *Variation in educational background.*—There is such a wide variation in the previous schooling of the enrollees that it is difficult to group them in classes according to scholastic standing. Therefore, one of the difficulties to be encountered is the necessity for grouping high-school students, and high-school graduates, with sixth-, seventh-, or eighth-grade students. The ability to learn does not, however, depend entirely upon grades completed in the regular school system. Many will have acquired considerable education since leaving school. This wide variation in educational background necessitates more individual assistance for those who are unable to keep up with the normal progress of the class.

2. *Practical experience lacking.*—A large percentage of the enrollees lack experience as a background upon which to build new information and ideas. Not having had practical experience in subjects which they may desire to study, they are unable to learn through the ear alone. Appeal must be made through all the senses—eye, ear, and hand. Most of these young men can think in a very practical way when the teaching is based upon some experience which they have had. Under the camp conditions it is not always possible to pro-

vide practice to fix an idea; but the instructor can in many parts of each lesson give practical application of the idea through an illustration, by citing a case, making reference to practical examples, or by giving a demonstration.

3. *Little or no interest in the subject.*—Many of the young men enrolled in these programs are there because they have had no training qualifying them for a job. They are indifferent, a number lack ambition, they have no objective, there is little or nothing at all to motivate them, and they are in the camp because it is the only place to go. Family influence and the home community associations have had much to do with their thinking. Some can see no reason why they should take a course which is planned to assist them in securing more desirable employment, since they see no possibility of getting a job after they return to their homes. This great lack of interest, varying to such a wide degree, presents a problem for the instructor. It is only one of the difficulties of the learner.

4. *Fear of exposing ignorance.*—Many of these young men will not attend classes because they do not want to expose their ignorance. They are timid, awkward, hesitant in asking for help, and because of their inability to express themselves clearly and their fear of being laughed at, they resent being called upon to participate in a group discussion. They are anxious to do something with their hands. Where this fear of exposing ignorance is apparent, the instructor should be patient in gradually removing it through tactful management of the individual.

5. *Little or no native ability.*—A wide variation in native ability of the enrollees exists. Some are capable of making rapid progress in the development of skills. Others have no ability to do anything of a manipulative character. Many have had no chance to develop their talents, and the camp educational program may provide this long-needed opportunity.

6. *Dislike for any and all kinds of schools.*—A large number of the enrollees have left the public-school systems because they did not like the way the courses were taught, the way

the teacher disciplined them, or the subject matter which was given them. They did not like the examinations, assignments, or methods of study as they were applied in the regular school system. They have reached the stage of manhood and must, therefore, be treated like men. They no longer have any respect for the grade-school procedures. They need a new kind of practical education and guidance.

7. *Inability to study.*—Few have been taught how to study. They have had little or no experience in looking up material for themselves. If they are to be trained more effectively to run under their own power, they must set up new habits of acquiring information. This is a challenge to the instructor.

8. *Fatigue.*—It will be found that many of these young men come to the classes in a very much fatigued condition. They are tired after having worked with the road crew, in the woods, or on a project all day. They may be sleepy, and become tremendously more so when they come into a warm room for instruction.

9. *Lack of physical fitness.*—It is the duty of instructors to report to the company commander enrollees in need of medical attention.

10. *Greater interest in other things.*—Interests outside the camp or in some cases games or sports within the camp may interfere seriously with group instruction. It is important that instructors make the training so attractive and valuable to enrollees that outside interests become of secondary importance.

11. *Personal influence of others.*—In every camp it is to be expected that enrollees will be subjected to influences which may be distracting and entirely undesirable. Members of the military and technical staffs carry great influence with the men of the company as to their interest in education. If the right attitude toward improvement of the enrollees prevails throughout the camp, a successful educational program of value to every man is bound to result.

12. *Dislike for the instructor.*—A number of instructors teaching in the camps are foremen, workmen, and members of the technical staff. The conditions on the work job may

develop an undesirable attitude on the part of an enrollee toward some member of the staff. If an enrollee dislikes the instructor, every effort should be made to correct this condition. If fairness and impartiality are displayed in the classroom, this difficulty may have only a slight effect upon conditions. Practice the golden rule.

13. *Failure to see any value in the course.*—The enrollee may not have been convinced of the value of a particular course, if it has not been properly presented so as to inform him of its content, its usability, and how the learning may be applied when he returns to his home.

14. *Need for individual help.*—In practically every class of any size there will be individuals who are unable to make normal progress. This may be due to illness, absence, inability to study, or the lack of native ability to learn. This is a difficulty that must be recognized early in each course, and a plan set up to assist these earnest, though sometimes backward, individuals over the stumbling places.

15. *Desire to work with hands.*—Since a large majority of the gainfully employed work with their hands, it is only natural that these young men should want to study something which will make it possible for them to use their hands in earning a living. The equipment in the camps for use in evening classes may be limited. There are many occasions, however, where the lessons presented in the camp during the leisure hours may be tied up with the work job. Or the enrollee may be so taught while in class that he acquired certain ideas about the practice which will make it possible for him to study textbooks, magazines, and correspondence lessons, thereby furthering his knowledge in a particular occupation. If he has an intensely keen interest in the subject, and each lesson is well taught, the enrollee will make an effort to apply the lesson in a practical way. Practical applications, demonstrations, and illustrations by the instructor of the ideas in each lesson will aid the student in this effort.

Camp Difficulties

The difficulties discussed under this heading are those under the control of the administration of the camp, usually the captain. It may be impossible to eliminate entirely some of these difficulties. All that can be done here is to describe the difficulties and offer some suggestions regarding them.

1. *Unsatisfactory places for holding classes.*—The use of the recreational hall or the mess hall for group instruction is not recommended. The first building is intended for other purposes, and the second is usually too noisy for effective conduct of instruction without distracting interruptions.

Good light in a room properly heated and ventilated is essential for evening classes. Quiet rooms are necessary for reading, study, and recitation.

Many camps have solved these problems by building separate school houses.

It is, of course, unreasonable to expect to find the same facilities for training in Civilian Conservation Corps camps as are found in modern school buildings. However, every effort should be made to provide, as far as possible, suitable quarters for these classes. In some camps separate buildings have been provided. In other places classes have been scheduled to meet in the recreation hall, and on class nights the recreation hall is closed to general use. There are many other ways in which this problem can be dealt with. The point is, that if the teaching is worth doing at all, an honest effort should be made to control conditions as far as possible, so that the time and effort put forth in teaching will not be wasted.

2. *Limited reference material.*—All camps have a library. Reference material has been provided to a limited extent. Some companies have supplemented this by donations of books by members of the camps and in other cases local communities have generously provided valuable reference works. Instructors should aim at building up a good reference library.

3. *Other camp activities.*—Camp activities may make it difficult for the learner to pursue his studies according to schedule. These activities include, for example, showing of motion pictures, athletic events, addresses, and camp duties. It is suggested that provisions be made to schedule these activities so as to avoid interference with classes as much as possible.

4. *Teaching equipment needed.*—Instructors with energy and initiative can usually secure material for demonstration and other supplies needed from nearby schools or business concerns. Much illustrative material may be secured through manufacturing agencies and their representatives.

5. *Size of the class.*—Under certain conditions the class may be too large. This may cause disturbance, noise, and distraction of attention, all of which increases difficulties for the student. Whenever a class exceeds 30, particularly when it is composed of healthy young men, one may expect considerable noise which is not easily eliminated. It is not possible with large classes to distribute questions and discussion so as to insure active participation of all members of the class. On the other hand, a class may be so small that there is lack of interest on the part of enrollees. Where only a few enroll, others may think that the instruction can be of little or no value or it would attract a larger number. No minimums or maximums can be suggested here. What size of class will insure best teaching results will depend in some measure upon the type of lesson presented. A class of 12 to 15 people in vocational subjects is, in general, considered desirable for efficient teaching. In all cases efficient class management is important.

6. *Class schedules not adjusted.*—The common practice in a majority of Civilian Conservation Corps camps is to conduct a class in a subject 1 hour a night, either 1 or 2 nights a week.

Consideration should be given to local conditions in scheduling classes. In some localities athletic events, dances,

wrestling matches, and other programs are scheduled on certain nights of the week. Should enrollees have sufficient interest in these events, classes should not be scheduled on those nights. The preparation of a calendar showing the nights each class will meet will make it possible to schedule athletic events and special lectures on the off nights, and to avoid scheduling classes on nights when other regular public events take place. Camp programs usually have one or more free nights for such affairs.

7. *Voluntary attendance.*—The attendance in classes is largely voluntary. Most students come because they want to learn. There will always be the curiosity seekers, some of whom may interfere with the smooth running of the program. Many of these, after visiting one or two classes, join and become excellent students. One of the principal success factors of a class is efficient management, commonly called discipline, of the students. A good class manager usually has no difficulty in handling all types of students. An efficient businesslike instructor, who knows his subject, knows how to teach, and knows how to manage, usually has a full class.

Instructor Difficulties

Under this heading are discussed the things which an instructor does or does not do which make it harder for the enrollee to learn. They are difficulties under the control of the instructor.

1. *Has not mastered skill and knowledge.*—Because the instructor has not mastered the skill and knowledge of a subject, the learner has difficulty in understanding and using to advantage that which is taught.

2. *Lacks ability to teach.*—Unless he has ability to teach and has learned further how to use as needed special methods and devices, the instructor cannot put over his subject. He does not know when to illustrate or when to demonstrate; he may talk too fast or too slow; he lectures instead of

teaching; he does not know when he has taught his lesson; he tells all he knows in one or two meetings and thinks he has been teaching.

3. *Lacks interest and sympathetic understanding of student needs.*—The instructor may not care whether or not he teaches and may make no effort to find out why the learners are not interested in his subject. He may try to handle the young men as children and be, in general, indifferent. He may not understand young men and may not be in sympathy with the fellow who is trying to improve himself. Effective learning cannot be expected under such conditions.

4. *Lacks ability to analyze.*—The instructor may not know how to analyze his occupation for teachable content. He may not know how to arrange the content in proper sequence, and in general, his material may be mixed, widely varied, unusable, and not all applicable to the subject selected for the lesson.

5. *Is too technical.*—The instructor may use big words in teaching and present problems over the heads of the learners. He may entertain a group, but from a learning standpoint the class has gained little. It is doubtful if a lesson can be too simple in its language. The college graduate, when he first starts to instruct in technical subjects, is inclined to teach the way he has been taught. Simple, common sense, occupational terms must be used if the teaching is to be understandable.

6. *Is not a good manager of the class.*—The instructor may cater to the exceptionally bright student and neglect the average or less brilliant individual. He may attempt to discipline instead of manage the class. He may lack business-like dignity; may not be orderly in his manner of procedure and habits; may allow disturbances to occur within the group, and may fail to control discussion. Under such conditions the students are confused and learning becomes more difficult.

7. *Does not plan in advance.*—Where the instructor does not plan in advance, it is difficult for the learner to follow the instruction because interruptions are bound to occur in getting equipment set up, selecting devices, and putting up

charts. This delay and lack of preparation in advance reduces the effectiveness of teaching.

8. *Has not sold himself to the class.*—The instructor may have failed to gain the confidence of the group. They may doubt his statements, have no faith in his opinions, and discount him in general. He is supposed, as the instructor of the group, to know his subject, to be able to teach it, and to command the respect of the group because of his successful experience in his occupation.

Chapter 9 ★ Analyzing an Occupation for Instructional Purposes

ANALYSIS here means the taking apart of an occupation or breaking it down into its parts so that these parts, or units may be rearranged in an order for effective teaching. Good teaching can be done only when small amounts of material are presented at one time. "One thing at a time" holds for teaching as elsewhere. The analysis of an occupation, therefore, consists of finding out just what these small units or parts are, and how best to arrange them to make the learning easy and the teaching effective.

No attempt will be made here to discuss how to make a complete analysis of a trade or occupation. For teaching purposes in Civilian Conservation Corps camps, there is rarely a necessity for making complete occupational analyses. An effort will be made, however, to point out how simple, teachable content can be formulated for instructional purposes under conditions such as are found in the camps

Making a Study of Camp Conditions

As a first step the instructor should secure satisfactory answers to such questions as the following, by way of informing himself concerning camp conditions, and the enrollees who are to be members of his class.

1. Who are the learners for whom instruction is to be prepared?
2. What are their ages?
3. What experience in this or similar work have they had?
4. How many hours are to be devoted to the course?
5. How long will each class period be?
6. Where is the course to be conducted?
7. What tools and equipment will be available for teaching?
8. What teaching devices or aids are available?

9. Will the instruction be of the classroom type or of the shop type?

10. Will the instruction be given by means of talks, demonstrations by the instructor, or actual shop practice by the students?

11. Will there be an opportunity for students to do practice work after the lesson is taught?

12. What analyses of occupations may be secured from the United States Office of Education, the State Department of Education, or from other sources, which will help in analyzing the occupation?

In considering these camp conditions and the nature of the instruction desirable and possible, the instructor should keep in mind his own qualifications, both as an instructor and as a tradesman qualified by practical occupational experience to teach the course.

The Type Job as a Part of the Analysis

With the above information in hand relative to the men and their environment, the *work job* may be considered as a logical starting point for the analysis of any occupation. An occupation may be analyzed into its component *work jobs*. In turn, the sum of these jobs taken as a whole constitutes the occupation.

For teaching purposes it is not necessary to consider all of the jobs which make up the occupation. Certain jobs, which are typical, may be selected. That is to say, one job representing a large group of very similar jobs may be selected. The typical job thus selected is called a *type job*. Grinding the valves of an automobile engine, for example, may be considered a type job. This type job may cover the grinding of valves on the engine of a Ford, Chevrolet, Cadillac, or Packard automobile. Although the general procedure is somewhat the same for each of these engines, the details of the job of grinding the valves for them may vary.

It will be readily seen that by adopting this plan of selecting *type jobs* for determining teachable content, the total number

of jobs required to represent an occupation is greatly reduced. Thus the occupation is first analyzed into its *type jobs*, and later the jobs are further broken down into a "doing" and a "knowing" analysis. The following suggestions illustrate the above procedure in making an analysis of this kind.

Details of Analysis by Progressive Steps

1. *Listing the jobs.*—One practical way of starting an analysis is first to make a list of all the type jobs in the occupation for which it is planned to develop a course of training. The form below is suggested for this purpose:

Occupation.....

Type Jobs

Job no.	Name or description of job
1.....	
2.....	
3.....	
4.....	

2. *Elimination and selection of jobs for the final list.*—After due consideration has been given to the camp conditions and facilities for instruction, and the jobs which make up the occupation have been listed, the next step in the analysis is that of eliminating from the list of jobs those which for various reasons cannot or should not be included in the course. This procedure will result in a final list of jobs which will constitute the instructional content for the particular group of students under consideration. Changes of content may, of course, be advisable for other groups.

3. *Job analysis.*—Having completed the list of jobs in the occupation as a whole, and eliminated from this list those jobs which do not function under Civilian Conservation

Corps camp conditions, the remaining jobs should be given a special analytical treatment for the purpose of finding out what teachable content they represent. Each of these jobs should be considered separately and a job analysis made of it. For this purpose a chart may be used with two parallel columns, one headed "What the worker does", and the other "What the worker needs to know." In the first column are listed all the things which a worker on the job ordinarily does in the performance of his duties; the information which a worker must have in order to perform the job well is set down in the second column opposite the appropriate "doing" items. The form indicated for this analysis follows:

Analysis of a job

Type job no. ----- Name of type job -----

What the worker does	What the worker needs to know
1.	
2.	
3.	

With this information in his possession, the instructor is in a position to teach the job, and its related technical information.

4. *Grouping jobs—Classification.*—When the type jobs are first listed, no particular attention need be given to the matter of *systematic or orderly arrangement*. In the reorganization of the material, however, the jobs which are closely related and which refer to the same general subject may be put into separate groups. For example, using the automobile again as an illustration, all the jobs relating to tire change, tire repair, vulcanizing, and patching may be grouped together and designated as tire jobs. Similarly, the jobs having to do with engine adjustments, repair, or replacements may be designated as engine jobs. This grouping or classification continues until all of the selected or final jobs are arranged

in their proper groups—which as a matter of convenience may be referred to as the tire group, the engine group, or other group as designated in the classification.

5. *Arranging groups and jobs in instructional order.*—In the matter of teaching it is logical to proceed from the easy to the more difficult, and from the simple to the complex. Obviously, some of the groups mentioned above will contain subject matter which is simpler than that of other groups. In other words, the jobs in some groups will be relatively easy to learn, others more difficult. An orderly arrangement of the groups for instructional purposes will place the simpler and easier groups first, gradually introducing the more difficult and complex.

What has been said regarding the instructional order of the groups applies also to the instructional order of the specific jobs within each group. In other words, the jobs are likewise arranged in their proper instructional order, so that the easy jobs are introduced first, and the more difficult ones later.

It is quite evident that the instructional order of the job may be entirely different from the order of operation or the production order. As an illustration of this dual order, the double column outline below is submitted representing the order of operations an experienced driver uses in starting and driving his automobile, and the order an instructor would use in teaching a beginner to drive.

Chart 3 ★ *Starting and driving an automobile*

OPERATION ORDER	INSTRUCTIONAL ORDER
<i>Sequence of steps in practice as taken by an experienced driver</i>	<i>Sequence of steps followed in teaching a beginner</i>
1. Inspect tires (look).	1. Steer and use accelerator.
2. Set brake if necessary.	2. Use clutch and brake in slowing down and stopping.
3. Check to see that gears are in neutral.	3. Continue driving practice, including road driving, passing, crossing, signaling, and negotiating hills.
4. Adjust spark and gas levers if necessary.	4. Stop and put gear lever in neutral position.
5. Turn on ignition (usually glancing at gas gage).	5. Disengage clutch and release brake.
6. Start engine and adjust gas and spark levers. Inspect oil-gage pressure.	6. Shift into low gear.
7. Release brake and disengage clutch.	7. Engage clutch, use accelerator and start car moving.
8. Shift into low gear.	8. Shift into second gear.
9. Engage clutch, use accelerator, and start car moving.	9. Shift into high gear.
10. Steer and use accelerator as needed.	10. Practice shifting from high to lower gears, including stop.
11. Shift into second gear.	11. Set brake.
12. Shift into high gear.	12. Check gears for neutral before practice in starting the engine as covered by 13, 14, 15, and 16 below.
13. Use clutch and brake in slowing down and stopping.	13. Adjust spark and gas levers.
14. Shift from high to lower gears.	14. Turn on ignition, inspect oil-gage pressure.
15. Stop and put gear lever in neutral position.	15. Start engine and adjust gas and spark levers. Inspect oil-gage pressure.
16. Turn ignition off.	16. Turn ignition off.

6. *Dividing the material into units of instruction.*—After completion of the analysis, if it is found that too much material has been developed for effective use in the time

available for instruction in any period of enrollment at the camp, it may be found advantageous to divide it into two or more units. In this event the first unit will include the material best suited for giving the student a general orientation in the occupation, and will consist of the simpler jobs. The second and each succeeding unit will contain practical jobs progressively more difficult. Unit courses I and II in "Automobile Repairing", one of the Instructional Outlines, in the series of separate publications prepared for Civilian Conservation Corps camps, provides a typical example of such division of instructional material.

7. *Determining job content for a lesson.*—In the development of the teaching material, through the process of analysis, it is evident that the type jobs selected to represent the occupation will vary in size. Some will be small jobs, others large. The job, therefore, is not to be considered as identical with a lesson. Some jobs may contain sufficient material for only one lesson, others may require several lessons for complete treatment. By a lesson is meant that portion of a job or of a subject which can reasonably be presented by the instructor, or developed by instructor-pupil discussion or reaction, within a given allotment of time set apart or scheduled for one class meeting or recitation. A lesson and a class period should not be considered as identical. Too often instructors think a lesson should fill a class period. In one class period one or more lessons may be taught. The period of time has little to do with what is to be taught. A lesson outline can and does in many instances contain several small lessons, all of which are included in the main lesson as planned.

In general the lesson plan should not contain too few teaching points. Each teaching point should include material sufficient for teaching the idea. On the other hand, if there are too many teaching points, the learners may not be able to get each idea intended to be taught, for the reason that some points may have to be covered too generally and sketchily to be understood. It is much better to teach main ideas and divide them into subteaching points. A complete

analysis will therefore provide for division of the teaching of jobs into lessons as may be required.

8. *The lesson plan.*—After the lesson or lessons have been determined upon for each job, the lesson plan is developed as a means of presenting the subject matter to the class. This procedure in instruction takes place in accordance with certain well established principles of teaching. A sample lesson plan outline used in the *Outlines of Instruction* for different occupations prepared for use in Civilian Conservation Corps camps has been given on page 60 of this manual.

Summary of Analysis

The special committee, brought to Washington for the purpose of preparing this *Manual* and the *Outlines of Instruction* covering a number of occupational subjects, used the analysis procedure described in this section.

This simplified form of analysis is condensed from a fuller analytical treatment commonly used in the field of vocational education. Properly carried out, as indicated by the above suggestions, this simple analysis of an occupation may be summarized as follows:

1. Preliminary study of the camp's conditions and facilities for instruction, and of the men enrolled for the course.
2. Preparation of a list of type jobs, commonly referred to as a "laundry list," representing the occupation which is being analyzed.
3. Preparation of a final list of type jobs, by elimination of such jobs as seem impracticable under Civilian Conservation Corps camp conditions.
4. Analysis of each type job retained on the final list, showing what a worker does, and what a worker needs to know in the way of technical related information.
5. Classification or rearrangement of the type jobs into groups of similar content, or groups made up on the basis of learning difficulties.
6. Rearrangement of these groups into an instructional order suitable for teaching and learning purposes.

7. Rearrangement of the individual jobs within each of these classified groups into an instructional order.

8. Division of the course material into two or more unit courses, if found to be too much for one course of 12 lessons.

9. Division of specific jobs into one or more lessons for each job.

10. Organization of the instructional material of each lesson into its proper form for teaching by means of a uniform outline lesson plan.

The Job-Analysis Procedure in General Education

No attempt will be made here to set up a procedure for analyzing general education subjects. It is well known that all such subjects as, for example, civics, English, and history, need analysis for the proper presentation of the subject matter. It is suggested that those interested in teaching any subject study the job-analysis procedure discussed above, and note how an occupation may be divided into parts for special instructional purposes, and how teaching content may be arrived at through careful study of each of the parts resulting from the analysis. It is suggested further that the unit of instruction in the other subjects be divided so as to coincide with that of the vocational subjects treated in the instructional outlines prepared by the committee. Through this process of analyzing and scheduling, it will be possible to parallel vocational subjects with other needed general education courses.

A survey of camp conditions and recommendations secured from corps-area advisers indicated that the units of instruction should contain 12 lessons of 1 hour each. The committee, in most instances, prepared two unit courses of 12 lessons each, or a total of 24 lessons in each of the subjects treated. This was done for the sake of uniformity in administering the educational program of the camps.



