

TEACHING DEVICES

FOR SPECIAL

TRAINING UNITS



WAR DEPARTMENT •

30 DECEMBER 1943

WAR DEPARTMENT,

WASHINGTON 25, D. C., 30 December 1943.

War Department Pamphlet No. 20-2, Teaching Devices for Special Training Units, is published for the information and guidance of all concerned.

[A. G. 300.7 (11 Oct 43).]

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UNITED STATES GOVERNMENT PRINTING OFFICE

WASHINGTON : 1943

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Section I

General

1. INTRODUCTION.—a. The development of basic academic skills in the Army necessitates the judicious use of highly motivated drill and practice exercises. Without frequent repetition in many meaningful situations, new material will not be mastered thoroughly and retained by most men in special training units. Nor will they develop the ability to apply to advantage the information or skills they have acquired. Highly motivated drill has an important place in the development of proficiency in any academic subject.

b. Education is to a large extent a process which involves the development of correct and generally useful habits. Fundamental habits in any academic field are established by meaningful repetitions. Failure to make steady progress in learning may be attributed to faulty patterns and to under-learned habits. Successful remedial endeavor will require the identification of these habits and the correction of some patterns. It will necessitate also the provision of additional drill which is essential if certain habits are to function smoothly and efficiently.

c. The teacher should be able to offer these instructional services. He should be thoroughly familiar with diagnostic measures in arithmetic, reading, and language. Following diagnosis, he should know how to employ appropriate corrective methods and procedures. Finally, he should be able to devise or procure the essential materials for carrying out the procedures which are indicated.

d. The teacher should be especially zealous to insure that drill is highly motivated. To accomplish this goal, he must have access to a variety of drill exercises and must use them correctly. These exercises should be adapted to satisfy individual and groups needs. And they should be associated clearly with situations and experiences in which they will have a genuine meaning and usefulness. Thus, drill materials, practice exercises, and games will prove to have wide utility both for regular classes and for special cases. Employed in this way, they will induce interest and foster efficient learning.

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2. PURPOSE.—a. It is the purpose of this bulletin to describe teaching aids, diagnostic procedures, and corrective exercises which the teacher in the special training unit can employ effectively.

b. To be of maximum value, these practice or drill exercises should meet several criteria. Aids and devices which fail to meet these requirements should not be used in special training units. Because of the limited time available for academic instruction, only the most efficient aids can find a place in this program.

c. Drill materials should have these characteristics. They should be—

- (1) Useful in the development of specific skills required in the Army;
- (2) Functional in that they present material in the form in which it will be used;
- (3) Motivating and varied;
- (4) Practical from the standpoint of cost, construction, and time consumed; and
- (5) Correlated with other instructional materials.

3. USEFULNESS.—a. A diagnostic study should be made frequently of each man's abilities and needs. Only when a student's changing strengths and weaknesses are known can the instructor decide which aids and practice materials to utilize with him at a particular time. Certainly, drill materials cannot be justified solely because they are attractive and interesting, although this consideration is of importance. It should be pointed out that all drill materials, including games and contests, should be employed only when the repetitive exercise they afford is needed to promote the acquisition of some worthwhile skills. Thus, in the special training unit, the use of games is not an end in itself. It is, instead, a way by which drill and exercise are offered through the introduction of challenging and novel learning situations.

b. Certain other cautions should be introduced. Drill exercises should be selected according to their suitability for use with students at various levels of development. For example, flashcards are helpful and appropriate at certain stages of learning; at others, their use is of doubtful value. Similarly, anagrams and crossword puzzles serve a definite but limited function. It is doubtful that such exercises provide the most effective means for meeting the language needs of non-English-speaking men, or even of those men whose difficulty is primarily in their lack of understanding and command of the special vocabulary of the Army. Such men require varied experience in which the new vocabulary appears in a simple, meaningful context. Other devices and aids have similar limitations. But they also have specific and definite value. It is of utmost importance,

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therefore, that the instructor use discriminating judgment in assigning drill exercises to groups or individual students.

4. FUNCTIONAL APPROACH.—Some games and devices fail to yield maximum results because they present facts in stilted or artificial form, whereas such materials should be offered in a normal, natural setting. To provide the best conditions for learning, it is not enough simply to employ an appropriate Army vocabulary, since knowledge of isolated words is in itself an inadequate acquisition. It is necessary also that each new word or fact be learned in a functional relationship or natural usage; moreover, the number of these relationships should be large enough to include many situations which will arise normally in Army life. The instructor must bear in mind the fact that some games and aids afford only aimless drill on irrelevant items. However entertaining such devices may be, their use cannot be justified unless the skills they stress can be readily integrated into meaningful and significant Army experience.

5. MOTIVATION AND VARIETY.—**a.** Meaningless repetition is relatively ineffective and may become tedious. Drill materials should appeal to adult tastes, but they must remain simple in form. The aids and devices which will be presented in this bulletin aim to satisfy both requirements. It is well to remember that the use of any of these devices should be discontinued if it is observed that interest is waning. But the teacher should make sure that the maximum benefit is derived from every device before it is finally given up. Drill devices should be judiciously selected; plans for their use should be carefully made; and results obtained from them should be systematically checked.

b. It should be pointed out that *group* games and devices serve an especially worthwhile function in special training units. They help to establish confidence, gratification, and success in activities involving other persons. For many men, group activity is much more stimulating than individual effort. This type of exercise has, therefore, strong appeal for many men. Moreover, such exercises often provide a means of developing skill in cooperative participation. Well-planned activities of these kinds will not only make learning a pleasurable and worthwhile experience; they will contribute, also, to the practice of teamwork which, in the Army, is a pervading ideal.

6. PRACTICALITY.—Practical considerations influence the choice of teaching devices. Practice exercises which are expensive or which require a great deal of time and effort in construction should be rejected in favor of simpler, more practical materials. Some instructors will be able to use mimeographed materials. In planning some practice exercises, the provision of mimeographed copies is an important consideration. In preparing

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other materials, standard lettering apparatus, such as the Wrico or Leroy sets, is useful. In some cases, hand lettering may be used. It is well to bear in mind that legibility, rather than artistic quality, is the aim in this work. In these and other ways, the ingenious instructor can develop a variety of valuable teaching aids.

7. CORRELATION WITH OTHER INSTRUCTION.—

Drill exercises for special training units should be correlated with other classroom experience. And they should be related to actual Army needs. In this way, learning will be both purposeful and pleasant.

8. SUMMARY.—By way of summarizing this introduction to the use of practice exercises and drill devices, attention is called to paragraph 34, FM 21-5:

“Drill is practice in standardized procedure. The object of drill is the attainment of skill in the performance of such duties, methods, or movements as are of frequent use. * * *

“It must be clearly understood that drill is a means to an end, not an end in itself * * * it is a great aid in the development of self-control and of a group spirit among the members of the unit.”

Section II

Teaching Aids and Devices

9. INTRODUCTION.—This section contains descriptions of teaching aids and devices suitable for special training units. The teacher should select the aids needed and should adapt them to fit his particular situation. Some of these aids can be used with the class as a whole. Others will prove more valuable for use with individual students. All of them must be adapted to meet specific needs.

10. FLASH CARDS.—a. Purpose.—Flash cards may be used to develop (1) rapid recognition of words, (2) quick recognition of phrases and sentences, and (3) speed and accuracy in arithmetical computation.

b. Construction.—The content to be displayed should be printed by hand or with a large printing set. The cards should be large enough to accommodate print which is $\frac{1}{300}$ of the distance from the front of the room to the last row of students in the room. The illustrations in figure 1 show flash cards in which words, sentences, and numbers are presented.

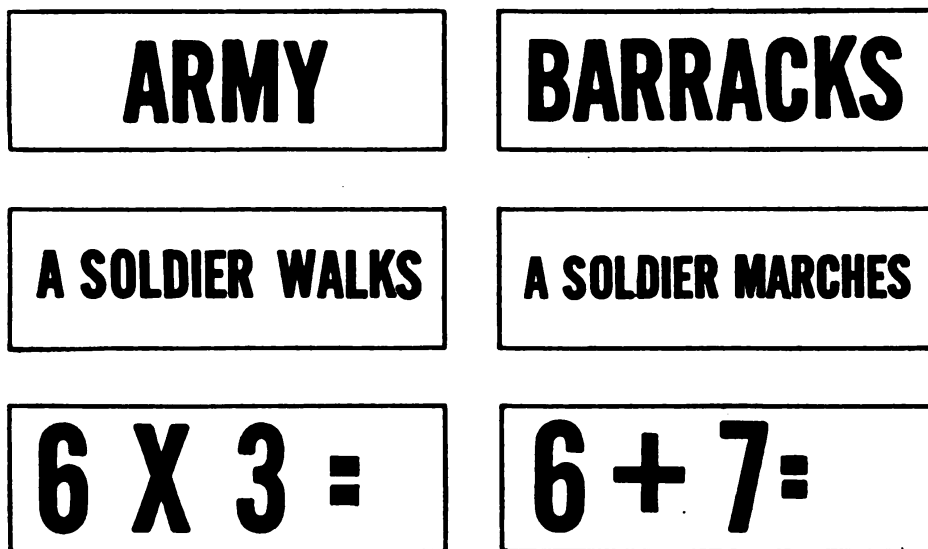


FIGURE 1.

c. Uses.—Some suggestions for the use of flash cards are given below:
(1) When new words are being presented for the first time, the instructor

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should (a) show the word, (b) pronounce it, and (c) ask the class to pronounce it. In the initial presentation, recognition rather than speed is the important consideration.

- (2) About five words or phrases will constitute a single lesson. Each word or phrase should be repeated according to the three steps given in (1) above, until the class has learned to recognize the entire group.
- (3) After the first five words or phrases have been mastered, another group of five should be taught in the same way.
- (4) The two sets of 5 cards should then be combined, shuffled, and presented as a group of 10 words. Similarly, when a third set of 5 cards has been learned, these will be grouped with the 10 preceding cards. In this way, review becomes a continuous process, covering a rapidly expanding list of words.
- (5) Every time a set is presented, the cards should be shuffled so that the students will not memorize the words in sequence.
- (6) After the students have learned the words or phrases on a set of cards, it will be desirable to try to increase their speed of recognition. The instructor will show each card for a fraction of a second only, calling upon the class as a whole or upon individual students to read it. The length of time the card is shown will depend upon the ability of the class to learn in this way. The time should be shortened as reading skill increases. The exercise will be abandoned when the students are able to read the words at a glance.
- (7) Computation facts should be identified with concrete situations. When these facts have been learned, flash card presentation may be used primarily to give exercise in making arithmetical calculations quickly. The speed of presentation should be determined by the difficulty of the calculations involved and by the speed at which the students can respond.

11. STUDY CARDS.—a. Purpose.—To furnish an effective self-teaching aid in learning words and phrases.

b. Construction.—A simple picture of an object and its name should be placed on one side of a small card, and the name alone on the other side (see figure 2). The number of cards will depend upon the subject matter to be acquired. Forty or fifty such cards might be used to test the basic vocabulary of sight words necessary for reading the Army Reader. With other materials, the number will be smaller. The size of the cards should be about 2 inches by 4 inches.

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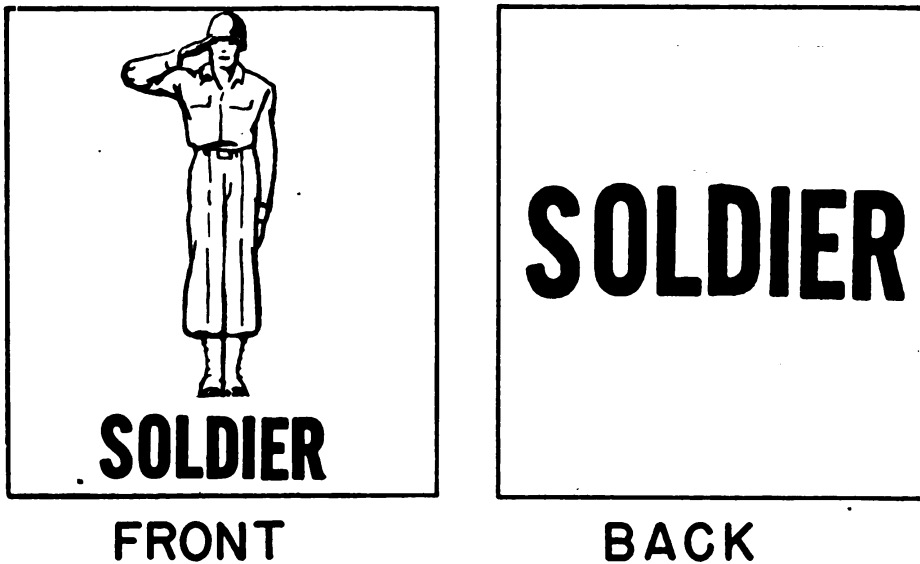


FIGURE 2.

Figure 3 shows a phrase recognition card, and figure 4 portrays a simple arithmetic card. Cards such as these may be used for presenting many types of material.

c. Uses.—These study cards can be used to foster word and phrase recognition, and to establish skill in arithmetical computation. Some ways of using them follow:

- (1) A set of cards should be given to each man. The student will study the words and pictures and turn the cards over. Then he should attempt to read the words without the aid of the pictures.
- (2) The student reads the word and then turns the card over to verify his response by checking with the picture. The cards containing the words that are recognized immediately are placed in one pile. The remaining words will be studied until they can be read without error.
- (3) If two students can work together, one student may act as a teacher and check the other. Errors can be quickly noted by the student teacher who glances at the pictures and words on the back of the cards. Corrections are then made, study proceeds, and rechecking follows. Thus two students can teach each other.
- (4) Students may retain their sets of cards and study them in the barracks.
- (5) Phrases and arithmetical facts can be taught with cards in the same manner.

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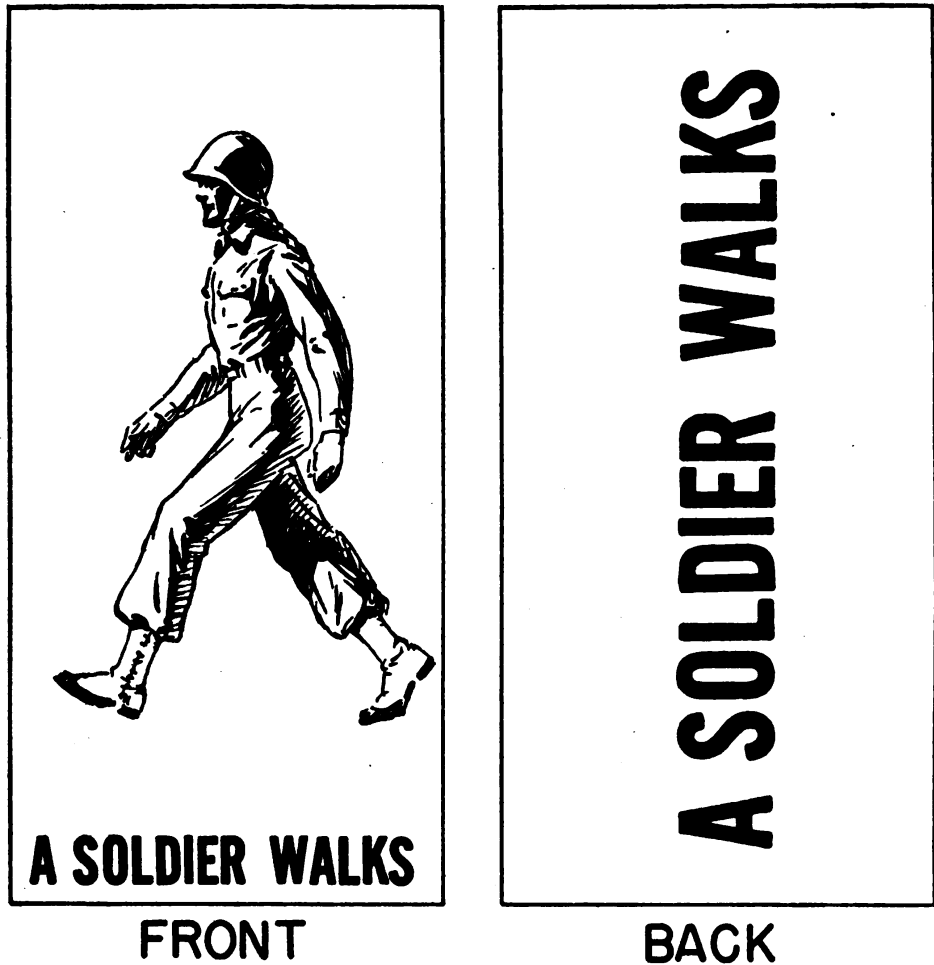


FIGURE 3.

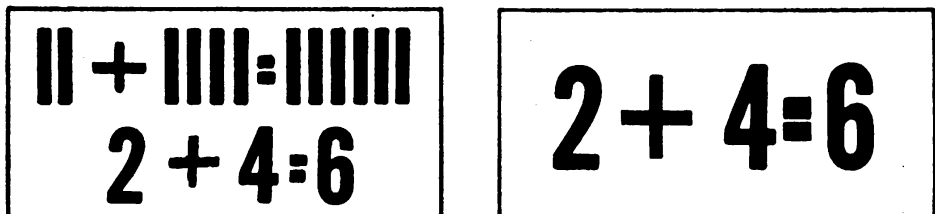


FIGURE 4.

12. WORD AND NUMBER WHEEL.—a. Purpose.—To develop skill in the recognition of words and phrases and to increase facility in the use of numbers.

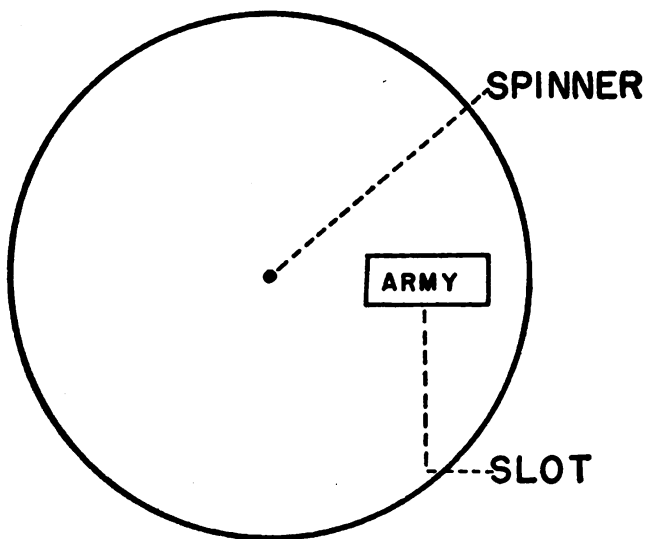
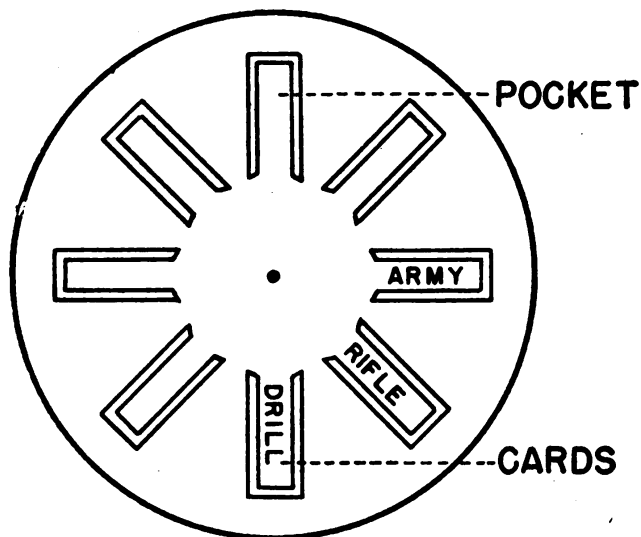
b. Construction.—The materials needed for the construction of the word wheel are two large pieces of oak tag or cardboard; if these are not available, the circular wheel can be constructed from scrap wall board, fiber board, lumber, or any other appropriate material which is available. A slot is cut in one of the circular boards. On the other, pockets made of heavy paper should be pasted at regular intervals around the edge. A large stock of word and number cards can be prepared, and the cards in the pockets may be changed as frequently as desired. The two boards are attached in the center, the slotted one uppermost, so that the under wheel can revolve independently. The simplest method is to drive a nail through the center of the two boards and into a wall or stand. A few iron washers or other disks may be used to separate the boards sufficiently to prevent friction when the under wheel is revolving. The under wheel should be loosened on the nail so that it will revolve freely. The top wheel should be fastened so that it will remain stationary. As the under wheel is revolved, words appear in the slot of the top wheel.

The diameter of the wheel should be at least 4 feet. The slot should be about 2 inches high, and long enough to expose the longest card which will be used in the wheel.

c. Uses.—The word wheel may be used for teaching many types of materials. Examples of its use follow:

- (1) Most words should be taught as sight words. Such words can be printed on cards to be placed in the pockets on the under wheel. The wheel can be revolved until a word appears in the slot. The students learn to recognize or read these words as they appear.
- (2) Short phrases can also be presented in this way.
- (3) The word wheel can be used for phonics and for word building exercises. One end of the slot may be covered with a card containing two or three letters which form the beginning or ending of several words. Cards will be prepared for the underwheel containing the letters necessary to complete these words. As the wheel is revolved, various complete words will appear (see figure 6). In the illustration, the outer portion of the slot is covered with the letters *ing*. The inner part of the slot remains open so that the symbols on the under wheel will appear in the open portion when the wheel is revolved.

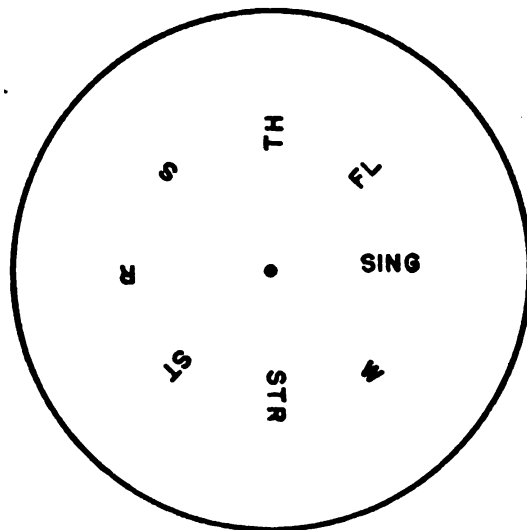
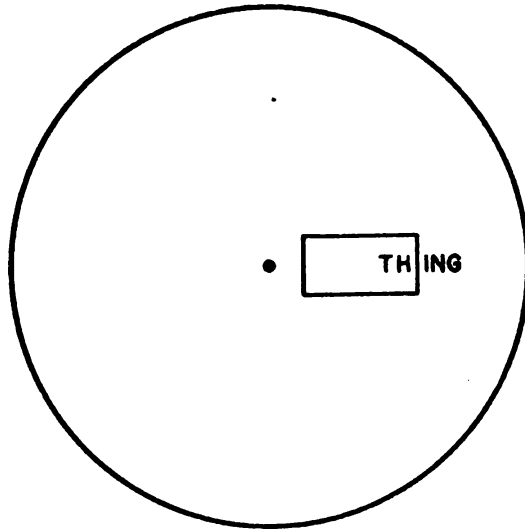
UNDER WHEEL



TOP WHEEL

FIGURE 5.

TOP WHEEL



UNDER WHEEL

FIGURE 6.

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- (4) In teaching arithmetical computation facts, one of the numbers and an arithmetical sign may be attached to the top wheel near the slot. The other numbers and *equals* signs will be printed on cards for the under wheel. These cards will be used in the same way as the word cards. Addition, subtraction, multiplication, and division facts may thus be taught through the use of this wheel. This type of work should always be done under the supervision of the teacher.

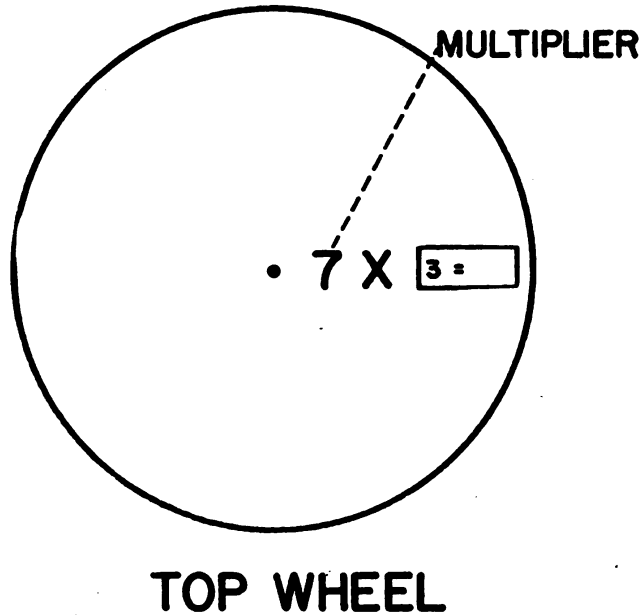


FIGURE 7.

- (5) Figure 7 shows a self-teaching arithmetic wheel. 7×3 appears without the answer. The under wheel can be arranged to provide drill exercise with any combination of numbers.
- (6) Many "games" can be played with this wheel. One student can spin the wheel while another reads. When the reader misses a word, he spins the wheel and the other reads. The one who reads the largest number of words correctly, wins. In playing another game, the class is divided into two teams. One person from one team spins and calls on a student from the other team to read the word that appears in the slot. When a member of one team misses a word, the other team has a chance to read the word. The team reading the largest number of words wins. The instructor should see that every student has an opportunity to take part in this game.

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13. SPINNER.—a. Purpose.—To teach word and number recognition and to give further practice in computation.

b. Construction.—An arrow spinner made out of wood or heavy cardboard is attached to a circular board about 3 feet in diameter (see figure 8). The tip of the arrow should be flexible so that it will bend enough to pass by pins which are stuck near each word. Words are pasted on the outside of the circular disk, or word cards are inserted in pockets pasted to the disk. Figure 8 shows the spinner with pockets attached.

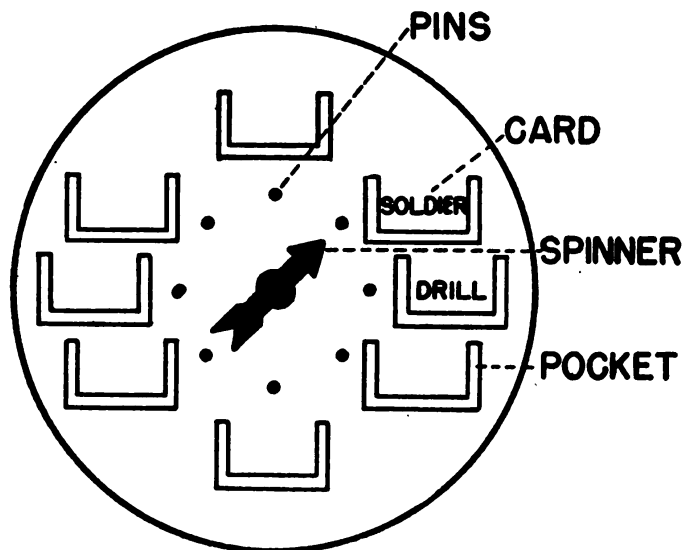


FIGURE 8.

c. Uses.—The spinner, which introduces the element of chance, constitutes an interesting teaching device. It can be used in the following ways:

- (1) The instructor can call the name of a student, then spin the arrow. The student tries to read the word at which the arrow stops. The instructor should encourage the other students to read the words silently as they are designated.
- (2) The class can be divided into two teams. A member of one team spins the arrow while members of the other team read the words. When a word is missed, the other team has a chance at reading it. The winning team is the one that reads the largest number of words in the period devoted to this exercise.
- (3) Numbers can be written on the disk or on cards which are inserted in pockets. The student is required to read the number at which the spinner stops. For a student who has not learned to recognize numbers, this device will offer valuable aid.

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(4) Addition, subtraction, multiplication, and division examples may be written on cards and inserted in the pockets. Procedures similar to those just described should be used with these combinations. This gives further practice in computation facts presented in a novel setting. To provide variety in the exercise, several computation problems of varying difficulty in addition, subtraction, and multiplication can be used so that the type of example one gets becomes a matter of chance. For instance, one student may get the example $2+4$. Another may get 8×9 . Thus, winning becomes not only a matter of ability, but a matter of chance in getting easy or difficult problems.

14. MOVIES.—a. Purpose.—To present sentence and paragraph reading in a new setting.

b. Construction.—The “movie” device consists of a large box, about the size of reading charts, with a roller at each end (see figure 9). Paragraphs of a story or whole stories used in beginning reading are printed on a long sheet of wrapping paper. Each end of this paper is then attached to one of the rollers. By means of a crank on the roller, the wrapping paper is so wound that one paragraph at a time appears.

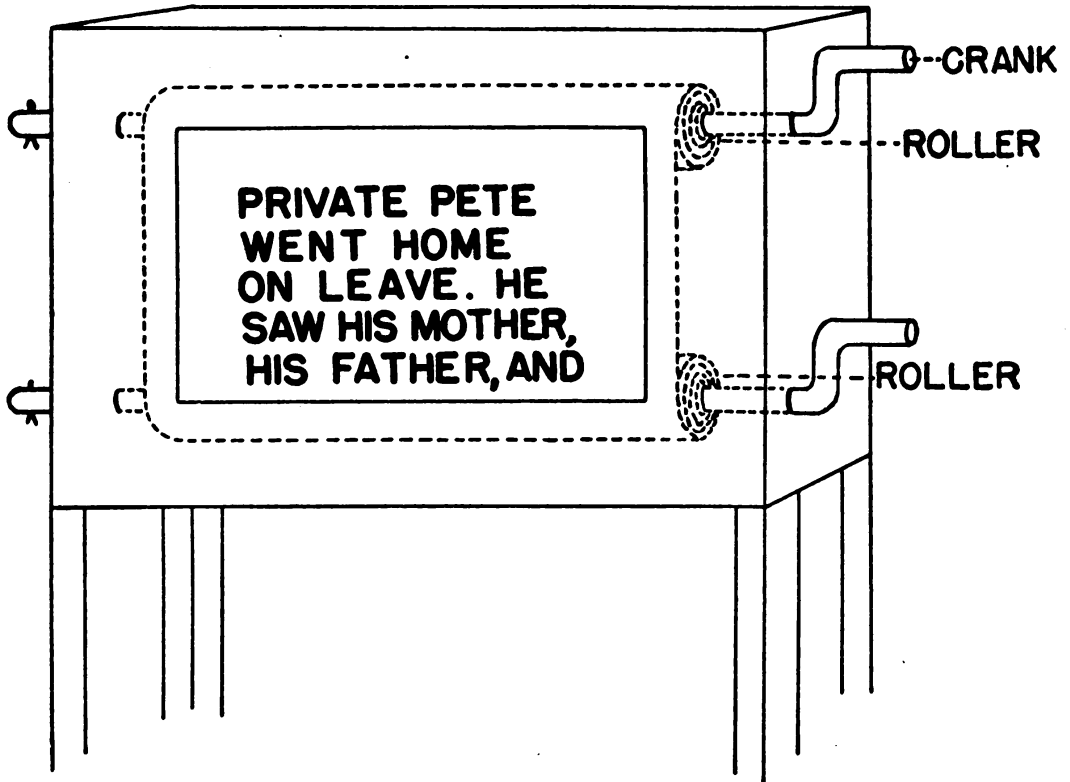


FIGURE 9.

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c. Uses.—Movies may be used to present reading material (1) one sentence at a time or (2) a whole paragraph at a time. Short stories may also be written either by the instructor or by the students, and used with this device.

15. ADAPTATION OF "BINGO".—a. Purpose.—An adaptation of the game of "Bingo" can be used for (1) word recognition, (2) phrase recognition, and (3) arithmetical computation.

b. Construction.—Select a list of 25 words. Type these words on a sheet of paper as shown in the example in figure 10. Type one sheet for each student, but change the order of the words on each one. Thus every student will have the same words on his sheet, but in different order. A set of sheets should be made in the same way for each 25 words to be learned. Each sheet should be pasted on a card.

The adaptation of "Bingo" shown in figure 10 was called "Victo" in one special training unit where it was used.

V	I	C	T	O
DRILL	COMRADE	BOMB	BED	INTERNAL
DISMISS	ASSIGN	COMMAND	CLOTHES	GRENADE
COURTEOUS	CANTEEN	OBLIQUE	POLITE	FURLOUGH
COURAGE	CADENCE	ASSEMBLE	RIFLE	FREEDOM
CONVOY	BRAVE	VIOLATION	MOVEMENT	EXERCISES
			LIBERTY	

FIGURE 10.

Another type of adaptation, "Addit," which may be used for practice in addition, is shown in figure 11.

A	D	D	I	T
12	16	18	9	7
4	8	14	11	6
17	10	2	13	5

FIGURE 11.

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c. Uses.—(1) For those who are poor in word recognition, a matching type of game can be used. In this game, the instructor writes the word on the board or shows it on a card. He pronounces the word, erases or removes it, then directs the students to place a marker on the word on their card. In this way they will obtain practice in matching the word from memory. When a student has markers on five words in a row, horizontally, vertically, or diagonally, he calls "Victo!" He is then asked to read the row indicated by markers.

(2) When this device is used with men who have some skill in word recognition, the preliminary step of writing the word on the blackboard or showing it on a card may be omitted. The instructor will merely read a list of words.

(3) The "Addit" game can be used to give practice in addition. In this game, the instructor distributes cards with whole numbers on them (see figure 11) and says, "Two plus four equals what?—Put a marker on it." The students are to find 6 and mark it. Or the addition combinations, such as $2+4$, are printed in the squares, and the instructor says, "Find the numbers that, when added, make six." A marker is placed on the square with $2+4$. When checking the cards, the instructor should give the problem and the answer, so those who do not mark the right ones can correct their errors.

(4) Further practice in subtraction, multiplication, and division problems can be provided in the same way as in (3).

16. READING EXERCISE (ADAPTED FOR GEOGRAPHY).—**a. Purpose.**—To give practice in the recognition of geographical names and places.

b. Procedure.—Prepare or secure commercial maps of the world or of a particular geographic area which you wish the students to study. If the maps are fastened to wallboard, they will be easier to use.

c. Uses.—(1) Maps with names covered up can be used for practice in the identification of geographic places. The names of the geographic places should be typed on cards and given to the students. Individuals can be requested to pin or tack (with thumb tacks) the name on the appropriate section of the map.

(2) A travel game may employ almost any map. In this game, the students are required to start at one place and to proceed to a specified destination. They are to write the names of all places through which they pass. For example, they might be asked to start from New York and travel to San Francisco by a particular route. The students will write the names of the states through which they pass. Variations of the games might require writing the names of cities, Army posts, service commands, and other important military positions.

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17. CALENDAR EXERCISE.—a. Purpose.—To give further practice in the use and understanding of the calendar.

b. Procedure.—Calendars should be obtained or made in abundant quantity.

c. Uses.—(1) Cut up calendar pads and arrange the sheets so that the months will not be in order. Have the students arrange the months in order starting with January. If the students cannot read the names of the months of the year, these should be written in order on the blackboard by the instructor. The students' lists can then be compared with the list on the blackboard.

(2) The class can be divided into two teams. One student from each team goes to the board and writes a month of the year, beginning with January. These two students are followed by other students in rotation from their respective teams; each successive player writes the name of the month that follows. The team which obtains the most accurate list of months is the winner. The scoring should consider the proper order of the months and the accuracy of spelling. A score of one should be given for every month recorded in order, and one point should be added for correct spelling.

Section III

Diagnostic and Remedial Procedures

18. LANGUAGE.—a. Introduction.—Problems in language may be divided into three types: sound, meaning, and usage. Since the men use language in practically every activity, the teacher should be on the alert to check, correct, and expand these three types at all times. Such an emphasis is more effective than prescribed, routinized language lessons.

b. Analysis of Difficulties.—Whenever the men are using oral language, the teacher should analyze pronunciation difficulties and devise ways of correcting them. This does not imply a strict adherence to the requirements of refined diction; it does mean a determined effort to help each man become articulate and reasonably successful in his ability to communicate with his comrades. If a soldier can make himself understood, whatever his dialect may be, then he can get along in the Army. Contact and experience with varied speech habits will soon enable him to understand and be understood by the men around him.

c. Remedial Procedures.—(1) Special attention, individual tutoring if necessary, should be given to particular sounds which the men do not make correctly. Words involving *j*, *l*, *r*, *s*, *th*, and *w* often give trouble. Sounds which depend largely on the correct lip position also cause difficulty for certain individuals. Some men will be able to relearn difficult sounds by imitation. Others may learn better by being told what to do with the teeth, tongue, and lips in forming each sound. There is probably little to be gained in special training units, on the other hand, by a complete analysis of all sounds, voiced and unvoiced, and so on. Additional suggestions for teaching men to sound words may be found in the section on phonics. The best results will be obtained if difficult sounds are incorporated in words and sentences. Extensive practice on isolated sounds may lead to a stilted, exaggerated enunciation. In each case the teacher should be sure that he himself is able to sound each word correctly so that the men may have a good pattern to copy. The instructor should, moreover, speak clearly and distinctly at all times so that he may be readily understood. He must not confuse the men by the sound patterns he sets

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for them. The men, too, should be encouraged to speak out as clearly and accurately as they can at all times.

- (2) Every effort should be made, likewise, to see that the men understand the meaning of the words used in Army life, and that they add to their own active vocabulary those words which are necessary for adequate expression and simple communication of ideas. Pictures, demonstrations, and illustrative sentences should be used to explain new words. (See Film Strip 12-5 and the accompanying Instructor's Reference for techniques for presenting nouns, verbs, and prepositions.) For slow learners, the use of supplementary devices may be needed to fix the desired concepts. Completion-sentence or jumbled-sentence exercises may serve as one test of understanding.
- (3) Individual or group exercises might be devised for getting the men to write as many different sentences as possible, using words apparently simple but which have many meanings, such as *get*, *come*, *go*, *see*. If the students exchange papers and discuss each other's sentences, it will help to increase their understanding of the varied meanings which words have. The spinner device already described in section II might also be adapted to this purpose.
- (4) Prepositions, the direction words, generally need special attention so that the men will not confuse their meaning. A chart showing a box with some other article placed in different positions with relation to it—*in*, *on*, *over*, *above*, *under*, *beside*, and so on—might be devised to help distinguish the meaning of these words. Flash cards might be used to provide additional drill on these words. In another exercise a box and a pencil are used. The teacher moves the pencil from one place to another and asks, "Where is the pencil?" The student should be encouraged to answer with complete sentences. Other simple exercises might also be devised to provide additional practice in the use of prepositions. These exercises should be employed with individual students and with the group.
- (5) The instructor should check the men's understanding of what they hear and read by asking questions about the content and by asking for a paraphrase or summary of the material. This "telling in their own words" also helps the students retain the information, and at the same time gives additional experience and practice in expression.

d. Oral Expression.—In order to develop facility in usage, students should be encouraged to express themselves verbally on many occasions. They should be given many opportunities to tell about their own experiences at home and in camp. One device might be to start a story, real or imaginary, of something which has happened in camp; then let

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each man add a sentence or two when his turn comes. Corrections should be made only when the man's speech is unintelligible or when he asks for help in articulating what he has in mind. (See chapter 4 of *Instruction in Special Training Units* for additional suggestions.)

e. Written Expression.—Oral exercises in language usage should be followed by written composition. Letters and stories should be developed cooperatively by the group and by individuals. The students should exchange papers and correct each other's work. This will foster interest and encourage accuracy. Another device for developing facility in composition is to have as many men as possible go to the blackboard and write a story. These stories are read and corrected by the class. Thus each man can see his good work recognized and his errors or misunderstandings corrected. Most of the men will be proud of their new accomplishments. The teacher may capitalize on this justifiable pride in order to motivate further accomplishment.

19. READING.—a. Introduction.—In reading, as in language development, there will be need for practice materials in order to form good habits. The *Army Reader*, *Our War*, *Newspaper Supplement*, and other publications for special training units will help meet this need for additional materials. Many special aids to meet specific needs may be devised to be used with these and other materials. Again, the assignment of drill exercises should be made only after careful analysis has been made of the good and bad reading habits of each man in the class. Keeping in mind the specific skills to be acquired, the instructor should observe carefully the performance of his students so that he can diagnose accurately and prescribe for the inadequacies of each one.

b. Developing Good Reading Habits.—(1) In the normal process of learning to read, certain fundamental skills should be developed. These abilities have been described as follows:

- (a) Recognizing and understanding a basic stock of words.
 - (b) Understanding new words and deriving meaning from context.
 - (c) Reading to follow directions.
 - (d) Reading to note detail.
 - (e) Reading to get specific information.
 - (f) Reading to understand the sequence and meaning of related items presented in a whole episode, unit, or chapter.
- (2) These skills and methods of developing them have been discussed in some detail in *Instruction in Special Training Units* (chapter V, paragraph 4).
- (3) Most of the devices described in section II, flash or study cards, spinner, and so on, are designed to aid in the development of reading vocabulary. Film Strips 12-5 and 12-7 present a basic stock of nouns,

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verbs, and prepositions. The teacher should constantly supplement these aids by using similar techniques for presenting other new words which come to attention, and which the men need to get along in the Army.

- (4) An easy initiation into reading to follow directions may be made by writing, on the blackboard, simple directions for carrying out class activities. This method might be used for administering tests, explaining practice exercises, or making other relatively complex assignments. Observe the response of the men carefully to be sure they understand what they are reading. In many cases, they should be asked to read and explain in their own words what is required for each step. After they have mastered simple sets of directions, let them go on to progressively more complex expositions. The class might be divided into small groups, each of which is to work out cooperatively a set of "military" directions for another group to follow; this or some other variation of charades might be made highly instructive. If the men are required to carry out the directions in each case, the lesson will be of maximum value. The instructor will also be better able to check the understanding of his men.
- (5) The Newspaper Supplement, Your Job in the Army, and selected Our War stories offer excellent material for drill in reading for detail and for specific information. Ask the men to find the answers to a specific set of fact questions on a particular story. Or ask them to examine the reading matter and make a list of details of time, place, direction, and so on. A competitive game might be made of such an exercise by comparing results, and finding which individual or which row of men has the most correct items.
- (6) These same publications may be used for drill in reading for understanding of whole units. Introduce each new story with an interesting and stimulating overview. Let the student see the problem as a whole before he begins to read. Then break it down and read it carefully for detail. After the parts of the story are thoroughly understood, it should be considered as a whole again. Ask the men to retell the story in their own words. Then have this summary condensed into one or two sentences.
- (7) For another exercise, give them numbered sentence summaries of each article in one issue of Our War; then ask them to see how quickly they can read the issue and find which sentence belongs to each article. Be sure that the summary does not carry the words of the title. This type of activity might be combined with the exercise suggested in the preceding paragraph to form a competitive group activity. Have

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each side work cooperatively on a set of sentence summaries for each article in their issue of *Our War*; then let the groups exchange papers, and match stories and summaries as before.

- (8) Still another device for helping the men learn to synthesize their reading might be worked out with several past issues of *Newsmag Supplement*. Have the group work cooperatively in tracing the development of a given campaign, Sicily, Italy, Russia, or the Pacific. After they have determined the sequence of events, ask them to trace the story on the map. This exercise might be followed by the writing of compositions in which each campaign is reviewed and brought up to date. These stories should be exchanged, in turn, and read for accuracy and coherence.
- (9) For advanced students, further drill in reading for understanding of whole episodes might be provided by asking the students to reread the *Army Reader* and summarize each chapter. Students could be required, also, to tell the class stories which they had read in other newspapers and magazines. In all these exercises, stress the ability to select the significant points in the story and to relate them coherently and clearly. Emphasize, also, how minor items contribute to the whole picture.

c. Development of Specific Skills.—Some men will need additional help with the following specific skills which are essential to the development of good reading habits.

- (1) VISUAL ANALYSIS.—(a) In the development of the sight vocabulary, students should be taught to recognize whole words and to distinguish words as units. For those men who have difficulty in doing this, the instructor may call attention to such distinguishing features as the relative length of the word, the height of the middle and end letters, and the position of letters going below the line. All clues to similarities and differences in words should be utilized.

(b) Attention should be called, also, to the small words contained within the big words, especially where the small word gives a clue to meaning and to spelling. Some men may profit by a study of the basic elements of derived words; a knowledge of common prefix and suffix forms and meanings will help them in remembering certain words. This visual analysis must necessarily be made in conjunction with emphasis on word meaning.

(c) Flash cards and the spinner described in section II are particularly useful in furnishing drill in this kind of analysis. Other devices may be similarly adapted and used to achieve this end. When students confuse two similar words, as *battle* and *barrel*, the

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simple expedient of writing them on the blackboard and calling attention to their differences and similarities should help to clear up the difficulty.

- (2) AUDITORY ANALYSIS.—(a) Some students learn to distinguish words more readily by sound than by appearance. Again students should be taught first to hear and recognize words as wholes and as meaningful symbols. Where they are unable to do this and when they need special help in working out the sound of new words, the instructor may find it profitable to help them break the word down into sound parts. When this is done, however, the teacher should be warned against the possibility of developing a stilted, artificial pronunciation. Sounds pronounced in isolation are often very different from the correctly blended sounds in whole words. The problem of blending the sounds, once they have been learned, into a correct whole, is one which deserves special attention. A difficulty with this method of word study occurs because English is a relatively unphonetic language; words do not always sound as they look, and there are many sounds for the same letter or combination of letters. With many words whose pronunciation constitutes exceptions to phonetic principles, the student must learn the word as an entity, not as a combination of already-learned sounds.

(b) When words are taught by sound analysis, the following procedure is advocated:

1. Begin by emphasizing the sounds of words already known to the student.
2. Proceed with words not yet in the stock of sight words, but still within the student's meaningful speaking vocabulary.
3. Use the techniques of sounding words in working out the pronunciation of new words. Encourage the student to develop confidence in doing this for himself.
4. Use context clues to teach the more common nonphonetic words. For example, the word *have* may be considered nonphonic. In the sentence *I have a rifle*, the student may first pronounce it with a long *a*; he will, however, correct himself as the meaning of the word becomes apparent through the understanding of the sentence. Teach students to anticipate a great many of these exceptions. If nonphonic words are overemphasized, students may become greatly disturbed since their efforts in sounding may produce words which are not recognizable.
5. Emphasize the importance of pronouncing the whole word correctly. This includes accuracy in each sound and a proper

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synthesis or blending of sounds. Avoid, for instance, *ser-gee-ant*, instead of *sargunt*, although the former may seem to be an accurate reproduction of the syllables in the word *sergeant*.

(c) Certain students may benefit by drill on words which involve special problems in sound analysis. Attention may be called to the different sounds of words which look somewhat alike, such as *bag* and *tag*, *bag* and *bed*, and so on. Emphasis on the common elements in certain words may help some students: *bring*, *thing*, *sing*, *take*, *bake*, *lake*. Stress may be laid, also, on the different ways in which a single vowel may be sounded, as the *o* in *uniform*, *shoes*, *socks*, and *soldier*.

(d) A list of word elements which will be helpful in preparing instructional materials for word analysis is given below:

1. Phonograms: ack, all, ame, ell, igh, ill, ome, ough, an, ar, at, ay, ed, en, er, et, ig, in, og, op, or, un.
2. Digraphs and diphthongs: ai, ay, ea, u, en, oa, oo, ou, ow.
3. Initial consonant blends: bl, ch, cr, dr, fl, fr, gr, pl, sh, sm, sn, st, sw, th, tr, tw, wh.
4. Final consonant blends: ch, sh, nd, nt, st.
5. Initial consonant sounds: b, e (hard and soft), d, f, g (hard), h, j, k, l, m, n, p, q, r.¹

(e) Exercises in auditory analysis as a means of word recognition may also be developed with flash cards, the spinner, and other devices already described in section II. Attention should be called once more to the fact that these drills in word analysis should be correlated with the total reading program; they should not be presented in isolation. Meaning in context is an essential part of word study. Other clues to recognition are a means to better reading habits; they are not valuable skills in themselves.

(3) PHRASE RECOGNITION.—(a) Phrase recognition should be a natural extension of the student's expanding skill in using words. Exercises in this skill should be started early and developed concurrently with practice in word recognition. It is sometimes helpful to study entire sentences and break them into several meaningful small units for further study. For instance, the sentence *The soldier marches to the drill field in the morning* can readily be divided into

The soldier
marches to the drill field
in the morning.

¹ Witty, and others. Teachers Manual, D. C. Heath and Co., p. 384.

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These phrases can be read, pictured, combined with other phrases, and used in new sentences. Finally, when they are reproduced in their original form, the new relationships and meanings in the sentence should be brought out in discussion. This simple exercise may lead to more complex ones, such as providing the class with a group of phrases to be made into sentences or coherent paragraphs.

(b) Students may develop phrases, also, by making titles for the pictures they find in their reading materials. They may also be asked well-defined questions requiring certain phrases as answers. Distinctions in meaning may be stressed by varying phrases in a given sentence: *He jumped into bed, on the bed, over the bed, in the bed; Pete washes in the morning, in the barracks, with soap,* and so on.

(c) Such exercises should be followed, naturally, by an emphasis on the ability to read paragraphs with accuracy and understanding. They should be used, generally, as part of the total reading program. When used for remedial purposes, they should be adapted to the particular needs of the men.

d. Faulty Reading Habits.—(1) FREQUENT ERRORS OF STUDENTS.—(a) Most reading difficulties are related directly or indirectly to poor comprehension. Meager vocabulary and limited backgrounds often explain this inadequate comprehension. However, even with very simple reading material, some students may fail to understand what they read. This may be caused by a number of related factors. Generally, these students will be found to have a short recognition span. Their inability to perceive words rapidly and accurately often results in word-by-word reading and incorrect phrasing. Consequently, they show many regressive movements instead of the rapid, rhythmic eye movements which characterize effective readers. Correcting these specific difficulties will aid in improving general comprehension. Likewise, emphasis upon reading for specific information, to find answers to questions, will help. Students will eventually correct bad habits or substitute good ones.

(b) Instructors will find that many of these poor readers exhibit a basic difficulty in word perception. They frequently display the following types of errors in oral reading:

1. Faulty pronunciation of vowels and consonants.
2. Reversals of letters or words.
3. Addition or omission of sounds.
4. Substitution, repetition, addition, or omission of words.

(c) The instructor is referred to Instruction in Special Training Units for additional comments on this problem.

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(2) REMEDIAL SUGGESTIONS.—(a) There are several techniques and devices which have proved successful in dealing with the errors listed in paragraph 19d (1). Some of these follow:

1. *Lists of words for specific errors.*—Lists should be prepared for use in constructing exercises for correcting specific errors. For instance, lists of words containing the short *o* sound, or other sounds which cause difficulty, should be compiled; likewise, lists may be constructed for use with students who present particular difficulties, such as adding or omitting the *r* sound in a word, i. e., *tack* for *track*, *dive* for *drive*, or the reverse of this.
2. *Phonetic stories.*—Here, again, each story should be devised to correct specific errors. If the student is having difficulty with the short *a* sound, for instance, a story with words stressing this sound will be useful.
3. *Picture cards.*—Have pictures of objects mounted on cards. There could be several groups of cards. For example, there might be one group beginning with the same consonant or vowel; another group might present the picture and word on one side, and the word alone on the other side.
4. *Sounding-tracing method.*—The word to be taught is written in large handwriting on a piece of paper, and pronounced by the teacher. The student is asked to trace and pronounce the word simultaneously. This device should be employed with great caution since it presents a somewhat unnatural situation, and one which may seem childish to adults.
5. *Concert reading.*—The teacher and the student read a passage aloud. For the student who has difficulty with a vowel or consonant, the picture cards can be useful. If, for example, the difficulty is the sound *s*, the student may be presented with a group of picture cards representing words which begin with this letter. After he learns to say these words, and to recognize the letter which represents this sound, cards containing words beginning with other letters are added. The student makes two piles, one of words beginning with *s* and another of the remaining cards.

(b) In some cases, the teacher will need to illustrate how certain sounds are made. He may have to show that the *m* sound is made with the mouth closed, and that *n* sound is made with the mouth open.

(c) With the few students who seem to profit by this kind of experience, the sounding-tracing method may be adapted to correct several types of

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errors. It may be used to help students with faulty vowels or consonants. The coordination of the sound with the manual response may aid in associating the various visual patterns and their correct sounds. This method may be tried also in correcting reversals. The left-to-right tracing and sounding of the word sometimes helps in developing correct habits of physical orientation. The sounding-tracing method provides students who omit sounds with an opportunity to overcome their difficulty by making a more accurate analysis of the word.

(d) For students who add sounds, appropriate lists of words should be developed. Short stories should then be made in which these words appear. These stories should be read aloud. If the student is adding the *l* sound frequently, the list could include such words as *pay, play; fat, flat; side slide*. The story would then include these words in meaningful context.

(e) Substitution of words frequently occurs when there is a limited reading vocabulary. In such cases, very easy reading material should be provided. It may help, also, to present picture cards, and develop an understanding of phonetic sounds through the use of word lists and short stories.

(f) Repetition of words sometimes occurs when the student is making other errors and requires time to pronounce a word which presents a difficulty. In such cases, the repetition tends to decrease as other errors are eliminated or reduced. When the repetitions are habitual, concert reading, by teacher and student, may help to reduce the tendency.

(g) The student's attempt to acquire speed often causes him to omit words. When omissions destroy meaning, attention should be directed to this situation. This may be accomplished through using a series of questions dealing with the passage. Concert reading, also, may aid in eliminating such errors.

(h) Poor readers occasionally manifest difficulties which may be due to physical defects or undesirable emotional attitudes. Errors caused by physical defects, whether visual, auditory, or vocal, need to be diagnosed by specialists in the particular field. Corrective measures should then be designated. Emotional reactions and irregularities should be studied before remedial steps are undertaken. The attitude of the student toward reading usually improves with a gain in his ability to read. However, an unfavorable attitude sometimes persists. In some cases, the teacher will need to convince the student of his ability to succeed in reading. In many cases, this will serve to establish self-confidence. Attitude may be improved also by starting at a level at which the student is unmistakably successful and by making his achievement become a source of pride and satisfaction for him.

(i) Each of the remedial suggestions outlined above may be helpful in correcting more than one type of error. The suggestions are illustrative rather than definitive and inclusive.

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20. SPELLING.—a. Introduction.—(1) Spelling should be taught concurrently with other language instruction. Accuracy in visualizing the letter arrangement of each word will contribute to correctness of pronunciation and to the ability to “unlock” new words encountered on the printed page. On the other hand, clear, accurate pronunciation and the ability to sound out new words will contribute to the accuracy with which the student learns the letter details of each word. Thus, the interrelationship of the spoken and written symbol is used to the best advantage.

- (2) For special training unit men, correct spelling should be looked upon also as a means of improving the clarity of written communication. While perfection in spelling is certainly commendable, however, it is not to be attained at the cost of valuable time which should be given to the development of skills more essential to success in the Army.
- (3) Stress in spelling should be laid on those words only which will be needed in written expression. The soldier does not need to be able to spell accurately every word he sees or hears. There is little reason for his learning at this time to spell words which he will not be able to use in his letters and other communications. If he has need for a new and difficult word or a strange proper name, he can either copy it or get help from an appropriate source. Moreover, the spelling of useful words should be stressed only in written form, since the soldier has little need for oral spelling. The words should be taught in context, not in the traditional lists of spelling words. Men in special training units must learn to spell the words they need in the form in which they must use them.
- (4) Suggestions have been offered elsewhere for following this functional approach. The Instructor's Reference for FS 12-5 shows how 46 basic nouns should be presented so that the men will learn to spell them at the same time that they are learning to sound them and to recognize them in print. Emphasis is placed upon meaning, as it should be. Learning is improved also by the multiple-sensory approach, making use of the visual, auditory, and kinesthetic senses. Similar techniques should be employed in presenting other new words.
- (5) Frequent and varied drill should be given on words in order to insure retention of correct forms. This drill should be closely correlated with all word study and analysis as a normal part of the learning process. For all but the slowest learners, no other special training in spelling will be necessary. For those who are still unable to make their written expression understood because of poor spelling,

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a special study should be made to diagnose the cause of the difficulty. The teacher should then devise special techniques for meeting these inadequacies.

- (6) Spelling rules should be employed sparingly. They should seldom be memorized. The nonphonetic character of English makes rules difficult to apply. There are, also, many exceptions to most spelling rules. Furthermore, many special training unit pupils, because of their relative inability to deal with abstractions, find difficulty with generalizations involved in rules.

b. Difficulties Found in Spelling.—To improve spelling ability in occasional problem cases, knowledge of the causes of deficient spelling is necessary. It is also essential to be aware of the most frequent errors made in spelling, and of their probable causes.

- (1) **CAUSES OF DEFICIENT SPELLING.**—(a) *Lack of motivation because of faulty previous instruction.*—Unfortunate experiences with spelling may have left the student discouraged as to his ability to learn. In addition, a number of faulty or underlearned habits may require correction or improvement.

(b) *Defective articulation and mispronunciation.*—Slovenly or defective speech often contributes to poor spelling.

(c) *Phonetic spelling.*—Attempts to spell some words according to phonic principles sometimes results in incorrect spelling, since English is essentially nonphonetic. Where there is an improper or excessive emphasis on phonics in the reading program, students frequently develop an unfortunate reliance on phonics as an aid in spelling.

(d) *Writing difficulties.*—The handwriting of poor spellers is typically inferior to that of good spellers. Improving a student's handwriting will not necessarily improve his spelling ability. However, if a student is free from concern about the mechanics of forming letters or writing words, he is better able to direct his full attention to correct spelling.

(e) *Miscellaneous causes.*—Instructors will find additional reasons for poor spelling. Minor sensory defects, insufficient to affect the trainee's status in the Army, may influence performance in spelling. Difficulties in language perception may also complicate a student's achievement in this field. These and other factors, some highly technical in nature, may contribute to a soldier's poor showing in spelling. When the instructor meets a stubborn case of disability, which does not respond to simple remedial measures, he should enlist the cooperation of the personnel consultant, the psychologist, or the psychiatrist to secure an adequate evaluation of the student's condition and needs.

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(2) ERRORS FREQUENTLY FOUND IN MISSPELLED WORDS.—Analysis of words often misspelled has revealed the following errors to be common:

- (a) Confusion of letters, as *n* and *m*; *u*, *v*, and *w*.
- (b) Reversals of letters, as *b* and *d*; *p* and *q*.
- (c) Reversals of letters which produce confusions in familiar words as *saw* for *was*.
- (d) Omission of initial silent letters, as *nife* for *knife*; *rong* for *wrong*.
- (e) Omission of final silent letters, as *crum* for *crumb*, *stor* for *store*.
- (f) Incomplete words, as *broa* for *broad*.
- (g) Inversion of letters, *yrad* for *yard*, *grem* for *germ*.
- (h) Vowel confusions, as the short sounds of vowels, *a*, *i*, and *e*.
- (i) Nonphonetic words spelled phonetically, as *wate* for *weight*, *koff* for *cough*.
- (j) Confusion of word endings, as *er* spelled *ier*, or *air*; *ed* spelled *et*.
- (k) Failure to double consonants as in *full*, *fill*.

c. Remedial Suggestions.—(1) EVALUATING THE DIFFICULTY.—The instructor should first make a study of the frequency and type of errors made by the students. After classifying the errors to ascertain which are most common, he should attempt to determine the probable contributing causes. His remedial instruction can then be planned most effectively. For example, if a majority of the students are relying too greatly on phonetic analysis, this can be met by giving adequate time and attention to basically important nonphonetic words. Words should be stressed as whole units at all times and their use and meaning in sentences clearly demonstrated. If many of the students are showing a tendency to invert letters, because of incorrect pronunciation, it should be possible, through proper exercises, to improve pronunciation. An inventory of errors, organized according to type, will guide the instructor in determining where to place his emphasis.

(2) GENERAL REMEDIAL PROCEDURES.—Procedures which emphasize meaning of the word, its sound, appearance, and special features often prove helpful in teaching spelling. Extensive use of methods which result in the coordination of the greatest number of varied sensory impressions is another effective means of overcoming spelling difficulties. Procedures in reading instruction which seek to improve the student's ability in word recognition and capacity to discriminate between words will improve spelling.

(3) RECOMMENDED AIDS AND GAMES.—(a) *Anagrams*.—The material for this game may be of the usual commercial type or may be constructed by having small cards cut out with letters on them. This aid may be used to teach letter discrimination as well as correct spelling forms. It may be employed in a number of ways, in most of which the game

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element will predominate. For example, the teacher may provide groups of students with sets of letters. He then pronounces a word and has each student start to make it at his desk. The student who completes it first is called upon to tell what he has done. Students who spell the word incorrectly are helped to see their mistakes. Varied repetition may profitably follow. One student may give the correct spelling orally. Others might write it on the board. The entire class may then be asked to write it at their desks. To maintain high and continued interest, points can be allotted for correct spelling during a contest. Competition may be fostered between the rows. Each row of students may be organized into a team. The student who spells the word correctly and completes it first receives five points. All other students who spell the word correctly obtain three points. Scores may be kept for each row, and the winner selected.

(b) *Word building*.—Anagrams may be used in another way. Students may be asked to build as many words as they can with a particular number of letters, three, four, or five, in each word. After a given period of time, the class is stopped; then different students are asked to present the words they have constructed. Attention is directed to the spelling of the words. To make the task more challenging, students may be asked to build words related to particular fields of military interest. For example, the instructor may say, "Make as many different words as you can think of which have something to do with interior guard duty."

(c) *Rearrangement word sheet*.—These sheets, also, may be mimeographed by the teacher. Words are presented with the letters disarranged. The students are asked to identify each word and write it correctly on the adjacent line, i. e.:

slodeir	-----
rlfie	-----
braracks	-----
pac	-----
cksos	-----

Emphasize the correct spelling. Write the correct form a few times. Pronounce and spell each word aloud.

(d) *Sentence and paragraph building*.—The class is given certain cue words and requested to write a sentence using them. For example, students may be told, "Make a sentence with the words *soldier* and *rifle* in it." Thus, students have to spell the words in context. Very easy exercises should be presented at first with one or two words only to be used in a sentence. The number to be used should be gradually increased and should not exceed three. In this way, practice is obtained in spelling certain words in their natural context, as parts of whole sentences.

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(e) *Summary.*—The above games, exercises, and contests can be employed effectively with small groups of individuals who experience great difficulty in learning to spell. They may be used also with regular class groups to motivate spelling and sustain interest in it.

21. HANDWRITING.—a. General.—(1) OBJECTIVES OF INSTRUCTION IN HANDWRITING.—Students in special training units should develop sufficient skill in handwriting to permit them to write easily and legibly. Special emphasis should not be placed on speed in writing. The major objective of handwriting is a clearly legible product.

(2) RELATION OF HANDWRITING TO LANGUAGE.—Writing is the medium through which the soldier can record his thought, wishes, and feelings. Written expression is closely associated with other language skills. The soldier will wish to write his friends or relatives about material he reads and experiences he has in camp. Sometimes, he may want to keep a written record of these experiences for his own use. The many and varied inter-relationships between all language forms should be kept in mind.

b. Methods.—(1) SUGGESTIONS FOR TEACHING HANDWRITING.—(a) Students should be given opportunity to develop correct habits in letter formation and spacing, and in keeping slant and alinement uniform. These are important elements in legibility.

(b) Students should have individual practice under proper guidance. Practice should be limited to words and sentences which they have occasion to use in written communication. Fundamentally, skill in handwriting is achieved through continuous drill. The acquisition of manual skills generally requires repeated application to develop proper sensory-motor coordination.

(c) In accord with previous recommendations, manuscript or print form of writing should be taught to those who have not learned to write.

(d) Letter models in manuscript and cursive form should be available for the students' use during writing and practice periods. Samples of sentences in the two forms should be employed. The student should be reminded that there are samples of the alphabet and numbers at the back of the Army Reader. He should be urged to refer to them whenever he is in doubt, since guessing leads to the formation of incorrect habits.

(2) CAUTIONS IN THE TEACHING OF HANDWRITING.—(a) There should be no special insistence on any particular posture and method of arm movement in writing. Students should be permitted a free choice among several possible writing postures; considerable freedom should be permitted also in the holding of the pencil and the slant of the paper, provided, of course, that this freedom does not result in inaccurate, illegible writing.

(b) There should be no practice in ovals, slanting lines, and other drill forms, since there is little transfer from such artificial exercises to actual writing.

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(c) It is inadvisable in special training units to have concentrated drill on different aspects of the writing process. Trainees should not be drilled to form individual letters perfectly before going on to spacing of letters or words; nor should they perfect spacing without simultaneous emphasis on developing proper slant and alinement. Special training unit students should spend most of their time, during instruction and drill, in the coordinated activities necessary in writing words or other meaningful units. Special attention should be given to particular parts of the total process only when it is apparent that particular incorrect habits are limiting further progress.

c. Difficulties Found in Handwriting.—Awareness of the factors which produce poor handwriting is necessary to improve students' abilities in this field.

(1) FACTORS CONTRIBUTING TO HANDWRITING DIFFICULTIES.

(a) *Inadequate background of writing experience.*—Many special training unit men have not had occasion to write much and so have not retained any skill which they may have originally acquired. Some have never been completely taught, so that initially there was insufficient integration of writing habits.

(b) *Poor motor coordination.*—Individuals with poor motor coordination find it very hard to write legibly and rapidly. A good number of special training unit men have for years been working at occupations in which gross muscular coordinations have been required. It is difficult for these men to shift to the fine muscular coordinations which are required in legible writing. It will be necessary for them to make the transition gradually and to have sufficient practice in order to fix essential neuro-muscular habits.

(c) *Inadequate language ability.*—Trainees who are limited in their power of verbal expression will often show evidence of inferior handwriting in their written efforts.

(d) *Poor spelling.*—The handwriting of inferior spellers is typically poor. Where uncertainty exists about correct spelling there is apt to be letter malformation, poor spacing and slant, and alinement difficulties.

(e) *Emotional blocks.*—Some students will experience difficulty in writing because of various emotional factors. Where the instructor feels that the student is showing undue resistance to writing, he should not use pressure to secure cooperation. Since it is likely that such resistances are related to other emotional conflicts, an effort should be made to study the individual to obtain an understanding of his total needs.

(2) CHARACTERISTICS OF POOR WRITING.—Evaluation of writing specimens has revealed the following difficulties to be characteristic of poor performance:

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(a) *Malformed letters.*—Letters may be inaccurate; or if accurate, they may be too large, too small, or irregular.

(b) *Improperly spaced letters and words.*—Spacing may be too crowded, too wide, or too irregular.

(c) *Unacceptable slant and alinement of letters.*—Slant may incline too far backward or too far forward, or it may be too inconsistent for legibility.

(d) *Uneven movement.*—The quality of line, which is determined by the smoothness of movement, may be faint, heavy, broken, or tremulous.

(e) *Rewritten letters and words.*—Letters and words may be written over, or lined out and rewritten.

d. Remedial Suggestions.—(1) ASCERTAINING THE EXTENT OF THE DIFFICULTY.—Instructors should make an analysis of the characteristics of the handwriting of certain students. Such a study will reveal the broad types of difficulties, i. e., form, spacing, slant, alinement, or movement. Sometimes it is desirable to make a more detailed analysis. For example, in studying letter formation, it may be noted that the letter *a* is often written to look like a *u*, *o*, or *ci*; similarly, the letter *b* may often be written as *l*, *k*, or *f*. Study of common errors of this type may be made profitably for the group and for individuals. Instruction should then be undertaken to overcome outstanding writing difficulties.

(2) GENERAL REMEDIAL PROCEDURES.—It is apparent that, when writing difficulties are associated with inaccurate spelling or faulty language, improvement in spelling or language may result in gains in handwriting. Similarly, relief from emotional blockings and other difficulties will sometimes be associated with improvement in handwriting. When poor handwriting is the result of insufficient training and experience, additional practice will be required. The nature of this practice will be indicated by study of each individual's writing. For example, to correct the quality of the line in writing, it may be necessary to adjust the student's grip on the pencil; and to improve slant, the arm and position of the paper often need to be altered. The teacher should encourage the student to note the proper position of the paper as he proceeds down the page, if the slant is to be kept relatively uniform. It will be found that the correction of limitations in one aspect of handwriting will improve other elements as well and will affect the total performance. For example, the correction of difficulties in movement or quality of lines results in fewer defects in size of letter; elimination of deficiencies in slant tends to correct errors in letter spacing; and improving slant yields improved alinement.

(3) SUGGESTIONS FOR IMPROVEMENT.—(a) Students should be encouraged in every way to strive for accuracy and neatness in their writing. Ask them to point out their own and each other's errors. Post

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the best letters and other compositions to serve as models. Remind the men that their friends and relatives will be better able to read neat, well-written letters. Urge them to copy their corrected letters before mailing them. Thus each student will bring about his own improvement as he strives for better attainment.

(b) Certain spelling and language aids and games may be adapted also to foster improvement in handwriting. Legibility of the written response should be considered in scoring certain games. As a result, students will be less inclined to develop slovenly habits in their effort to write rapidly.

22. ARITHMETIC.—a. General.—(1) **MATERIALS AVAILABLE IN THIS FIELD.**—Previous publications for special training units have covered various aspects of the teaching of arithmetic. The Teacher's Guide to Instructional Materials, DST-M3, pages 22-24, contains recommendations for the classroom use of Army Arithmetic, TM 21-510. The Illustrated Instructor's Reference to accompany FS 12-6, Introduction to Numbers, contains many suggestions for the development of vocabulary, concepts, and number relationships requisite to successful initiation into arithmetic. And the Manual for Administering and Using Unit Test in Arithmetic, DST-16a, pages 8-12, has valuable suggestions for diagnostic and remedial work in arithmetic.

(2) **OBJECTIVES OF THE PRESENT MATERIAL.**—The present material aims to supplement the foregoing suggestions and will treat the following:

- (a) Typical errors in arithmetic in special training units.
- (b) Principles that may be used to guide corrective instruction.
- (c) Recommended aids and devices for classroom use.

b. Typical Errors Found in Arithmetic in Special Training Units.—(1) In general, special training unit students make the usual arithmetic errors which are attributable to inaccuracy, carelessness, and failure to know addition, subtraction, multiplication, and division combinations. A recent analysis of students' performance in arithmetic in special training units revealed that the following errors occurred frequently:

- (a) *Errors in addition.*

1. *Disregard of column position.*—The students do not add the units column, then the tens column, etc., but add all the numbers as if they were in one column. For example:

$$\begin{array}{r} 35 \\ +13 \\ +4 \end{array}$$

is added as follows: $1+3+5+3+4=16$.

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2. *Carrying difficulties.*—Students forget to add the number to be carried, or they carry the wrong number, or write the carried number in the answer, or carry a number when there is none to carry.

(b) *Errors in subtraction.*

1. *Borrowing errors.*

(a) Students do not allow for having borrowed. To illustrate, in the example

$$\begin{array}{r} 734 \\ -387 \\ \hline 457 \end{array}$$

if no allowance is made for the borrowing in the units and tens columns, the answer 457 is obtained instead of 347.

(b) There is a failure to borrow when necessary, and zero is always given as the answer whenever a larger number is taken from a smaller one.

(c) Students show evidence of random borrowing. To illustrate, in the example

$$\begin{array}{r} 407 \\ -198 \\ \hline 119 \end{array}$$

the following reasoning seems to prevail: to subtract 8 from 7, borrow 1 from the 4; then, to subtract 9 from 0, borrow another 1 from the 3 that was left after having borrowed the first 1 from the 4; then, subtract 1 from the 2 that is left after the two 1's have been borrowed from the 4.

(d) The following additional errors are shown by the students in borrowing: deduction from the minuend, when borrowing is unnecessary; deduction of 2 from the minuend after borrowing; and increasing the minuend digit after borrowing.

2. *Confusion of minuend and subtrahend.*—In errors of this type, the students subtract the smaller number from the larger, regardless of whether it occurs in the subtrahend or minuend. To illustrate, the example

$$\begin{array}{r} 734 \\ -387 \\ \hline 453 \end{array}$$

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is worked in this way: 4 from 7 is 3, 3 from 8 is 5, and 3 from 7 is 4.

3. *Confusion of process.*—Students often add where subtraction is required. It is likely that some of the students who do this are aware that subtraction is the process needed. Since they are unable to do subtraction, they add the figures rather than omit the example.

(c) *Errors in multiplication.*

1. *Omission of number in multiplier and multiplicand.*—Three procedures are fairly common in this type of error. In the example

$$\begin{array}{r} 32 \\ \times 14 \\ \hline 38 \end{array}$$

the incorrect answer is obtained by multiplying 2 by 4 and 3 by 1. The example

$$\begin{array}{r} 76 \\ \times 35 \\ \hline 2,130 \end{array}$$

is solved by multiplying 6 by 5 and putting down the 30, and then multiplying 7 by 3 and recording the 21; thus, the answer 2,130 is secured. The same example is solved frequently in the following manner:

$$\begin{array}{r} 76 \\ \times 35 \\ \hline 30 \\ 21 \\ \hline 240 \end{array}$$

In this case the 21 is added to 30, after it has been moved over to keep it under the multiplier 3.

2. *Adding or subtracting instead of multiplying.*—Students frequently add or subtract in examples which require multiplication. Thus, the example

$$\begin{array}{r} 76 \\ \times 35 \\ \hline \end{array}$$

may yield the answer 111 or 41.

3. *Miscellaneous types.*—Other types of errors are confusion in the position of partial products, and errors in carrying and summing, such as were noted under addition.

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(d) *Errors in division.*

1. *Contributing errors in multiplication and subtraction.*—Multiplication and subtraction are important elements in division. Inability in either or both of these processes makes it difficult for the student to master division.
2. *Incomplete division.*—Students often use the partial remainder without bringing down the new dividend figure; they then put a zero in the answer because the partial remainder is smaller than the divisor. The example

$$\begin{array}{r} 10 \\ 8 \overline{)128} \\ \underline{8} \\ 4 \end{array}$$

represents this type of error. Instead of bringing down the eight and dividing 48 by 8, 4 is taken to be less than 8 and a zero is put in the answer.

3. *Incorrect use of divisor.*—When the divisor contains more than one figure, students occasionally use the digits of the divisor separately. In the example

$$\begin{array}{r} 24 \\ 45 \overline{)820} \end{array}$$

4 is taken to go 2 times into 8 and 5 is taken to go 4 times into 20; hence, the answer 24 is obtained.

4. *Miscellaneous errors.*—Some other errors shown by students are to begin dividing at units end of dividend, to group too many digits in dividend, to use digits in the dividend twice, and to omit the zero in the quotient when zero results from a zero in the dividend.

(e) *Errors in arithmetic problems.*—Students make the same types of errors in arithmetic reasoning problems as in the strictly numerical examples involving the same operations. They show also other errors which are caused by an erroneous formulation of the problem from the verbal material given. Frequently, students know *how* to add, subtract, multiply, and divide, but they do not know *when* to do so. This type of limitation may be due to inadequacy in reading or to an inability to analyze the problems and associate the correct process with the steps involved.

c. Principles That May Be Used to Guide Corrective Instruction.—(1) Remedial instruction is most effective when it aims to correct known specific difficulties in the group. To make an analysis of class performance in arithmetic, instructors should use Unit Test in Arith-

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mestic DST-16a. This test yields a measure of general arithmetic performance, and it is so devised that it will reveal specific weaknesses and strengths in different aspect of arithmetic, i. e., simple number relationships, computational processes, and arithmetical reasoning.

(2) The following principles may be used to guide remedial work:

(a) Instruction should be planned to correct those errors and error patterns which are most frequently encountered.

(b) Remedial instruction should emphasize the meanings of numbers.

(c) The amount and type of repetition should be planned in terms of extensive and continuous diagnosis of each student's needs.

d. Recommended Aids and Devices for Classroom Use.—There are many aids and devices which can be used in the classroom to improve speed and accuracy in numerical computation and reasoning. Some of the more useful ones are (1) flash cards, (2) self-study cards, (3) word and number wheel, (4) self-teaching arithmetic wheel, (5) spinner, and (6) adaptation of "Bingo." Ways of adapting these for use in the classroom are presented in section II, Teaching Aids and Devices. Judicious use of these aids facilitates remedial work. Through them, drill can be made both varied and interesting.

Section IV

Sources of Additional Teaching Materials

23. INTRODUCTION.—Many instructors will be interested in securing additional materials for use in their special training unit classes. The available materials are few, since comparatively little supplementary material has been developed for this specific purpose. The citizenship books and other stories devised by the W. P. A. are perhaps the most useful and suitable of the recent publications. They are written for adults who have very little reading ability. A number of magazines or papers such as *My Weekly Reader* are designed for children; yet their subject matter is generally of interest to adults. These publications contain some stories which are suitable for men in special training units. Other materials may be adapted to meet the needs of soldiers in these units. A concern for the proper adaptation of materials should be kept in mind by the teacher in the selection and use of any of the publications which follow. This list of sources includes a circular which itemizes various kinds of free or inexpensive teaching materials; it contains, also, specific references to useful teaching aids and reading materials. The annotations will help the instructor in making a wise selection.

24. MATERIALS FOR TEACHERS.

a. A List of Free and Inexpensive Teaching Materials.—Work Projects Administration, Division of Professional and Service Projects, Washington, D. C. Margaret Stanley, compiler. W. P. A. Technical Series. Community Service Circular, No. 8, Education Circular No. 3 (mimeographed), Washington, D. C.: Work Projects Administration, 1940.—Very useful to teachers in locating suitable materials which may be obtained at little or no expense.

b. Health Bulletin for Teachers.—School Health Bureau, Welfare Division, Metropolitan Life Insurance Co., Madison Avenue, New York City.—A free monthly bulletin dealing with various health topics. There are also accompanying bulletins for parents and separate bulletins for boys and girls.

25. TEACHING AIDS IN READING.

a. Games and Devices for Remedial Reading.—F. El-mendorf, A. Jameson, and F. Pierce, compilers. Institute for Juvenile

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Research, 907 South Lincoln Street, Chicago.—“Sixty-two mimeographed pages with illustrations and detailed instructions for 30 games and devices which have been found useful in teaching children to read.”

b. Reading Aids Through the Grades.—D. H. Russell, E. E. Karp, and E. F. Kelley, Bureau of Publications, Teachers College, Columbia University, New York, 1938.—A brief outline of causal factors in poor reading and principles of remedial work is followed by a comprehensive assembly and description of 225 devices, exercises, and activities for improving reading ability.

c. Remedial Reading Drills.—T. G. Hegge, S. A. Kirk, and W. D. Kirk. Ann Arbor, Michigan. George Wahr, publisher.—These drills are “a series of exercises systematically designed to correct reading disabilities of an extreme nature.” They are designed primarily for children whose reading is at the first-, second-, or third-grade level.

26. ADDITIONAL READING MATERIALS FOR STUDENTS.

a. Good Ten-Cent Books for Children.—The University of the State of New York, the State Education Department, Library Extension and Rural Education Divisions, October 1935.—A selected and annotated list of books for children which may be purchased at the five-and-ten-cent stores.

b. History of Bread.—Elementary Education Division, W. P. A. Adult Education Program, Board of Education, New York City.—An eight-page pamphlet describing the history of the making of bread. It is written in an elementary and interesting style about a topic that will appeal to many. This is typical of many pamphlets which have been constructed to aid adults in learning to read.

c. My Weekly Reader.—American Education Press, Inc., 40 South Front Street, Columbus, Ohio.—A weekly paper published in five editions for grades I–VI. “It brings the usual words of the grade in a variety of reading situations of real-life appeal.” Contains stories dealing with community life, health, nature, science, and foreign peoples. It aims to stimulate interest in reading, and to perfect reading skills by providing interesting material on the elementary level.

d. The Smith Family.—W. P. A. Adult Education Program of the Board of Education, New York City; 44 pages.—Contains full-page cartoons with a one-line explanation at the bottom. As one proceeds, these lines develop a story. After every few pages there are practice themes summarizing the action of the preceding pages. These materials have been developed for adults who are learning to read.

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e. Ten-Cent Unit Study Readers.—American Education Press, Inc., 40 South Front Street, Columbus, Ohio.—A series of 80 supplementary readers, 15 for each of the first 4 grades, and 10 each for grades V and VI. Each contains a wealth of factual material and a collection of illustrations dealing with a single topic. For example, Unit Study Book No. 101 is Travel, for the first grade, by Eleanor M. Johnson; it gives descriptions and photographs of trains, buses, horses, boats, etc.

f. All Around New York.—Book Two, Randall's Island, U. S. Works Progress Administration, New Reading Materials Program, Board of Education, New York.—This very short booklet depicts an evening spent in a show on Randall's Island. It is printed in the form of cartoons with brief reading material underneath. (See comment under The Smith Family, above.)

g. On the Way to Democracy, Books 1, 2, and 3; and Teacher's Manual.—National Citizenship Education Program, W. P. A. and U. S. Dept. of Justice, in cooperation with the U. S. Office of Education, Washington, D. C.—This is the first set of a series of booklets on the American Constitution and Government, designed for use in adult citizenship classes. Each book contains the same basic content and illustrations, but is written at a different level of reading difficulty from the others; the exercises are also different.

h. Our Government, Book I; Workbook, Book I; Teacher's Edition, Book I.—National Citizenship Education Program, W. P. A. and U. S. Department of Justice, in cooperation with the U. S. Office of Education, Washington, D. C.—Designed for use in adult citizenship classes. This booklet teaches basic concepts of our Government. The Workbook contains several types of exercises based upon Book I. The Teacher's Edition elaborates further on the concepts presented and offers teaching suggestions on the use of both Book I and the Workbook.

