JOB INSTRUCTION

SESSIONS OUTLINE
and
REFERENCE MATERIAL

Copy No._____

For the Personal Use of

_____

As a War Production Trainer

Training Within Industry Service
Bureau of Training
WAR MANPOWER COMMISSION
Washington, D. C., 1944

A short, intensive training program for supervisors and job instructors presented by Training Within Industry Service in cooperation with Federal and State representatives for Vocational Education.

TRAINING WITHIN INDUSTRY SERVICE

BUREAU OF TRAINING

WAR MANPOWER COMMISSION

Washington, D. C. : 1944

Divider Page from Original TWI Materials Bound Text

II—Job Instruction

The Training Within Industry program of Job Instruction was developed in order to provide management with a tool whereby supervisors could acquire skill in instructing.

The material in the "Job Instruction Sessions Outlines" covers the content as handled in five 2-hour meetings for a group of ten supervisors.

WAR MANPOWER COMMISSION

WASHINGTON, D. C.

May 1944.

To the War Production Trainer:

You have an opportunity to render a service of constructive and far-reaching significance through this Job Instruction Plan.

You also accept a major responsibility when you assume leadership in this plan. To a large number of industrial men, YOUR presentation of it may represent all they know, first hand, of the whole war training effort and its vital role in war production.

You should strive with all the energy and diligence you possess to lead each group in Job Instruction in the very best way possible—and to do a still better job with each succeeding group.

To assure a uniform high standard on a Nation-wide basis, you should work from this outline ALWAYS. Don't deviate from it. Don't trust to your memory, regardless of the number of times you may present the plan. It is not difficult and if you follow instructions you can't fail—furthermore, you will find it an interesting job.

Once again, leadership in Job Instruction presents an opportunity and an obligation.

Sincerely,

C. R. Dooley

C. R. Dooley, Director,
Training Within Industry Service.

Preview of the Standard 10-hour Job Instruction Plan for War Production

FIRST SESSION—2 hours.

Introduction.
Importance of training to production.
Instructing ability as a personal asset.
Demonstration of faulty instruction.
Demonstration of correct instruction.
The FOUR BASIC STEPS.
Distribution of "How to Instruct" cards.
(Selection of 2 volunteers for the next session.)

SECOND SESSION—2 hours.

Two volunteer "instructing" demonstrations, to bring out the NEED for the four things an instructor must do to "get ready."
Practice in making job breakdowns of:
(a) The fire underwriters' knot.
(b) The two jobs presented during the first hour.
Summary: The four things an instructor does to "get ready."

THIRD SESSION—2 hours.

Drill on training time tables.
Three practice instruction demonstrations with coaching on Job Breakdowns.

FOURTH SESSION—2 hours.

Four practice instruction demonstrations with coaching on Job Breakdowns.

FIFTH SESSION—2 hours.

Three practice instruction demonstrations.
Conclusion and Summary.
(a) Questions.
(b) Importance of good Job Instruction to production.
(c) Necessity of using the Job Instruction Plan.

ADHERE STRICTLY TO THIS PLAN—DO NOT DEPART FROM IT OR CHANGE IT

Sessions Outline

Session I

BEFORE the Session starts:

Be there 15 minutes ahead of time. Be sure you have sufficient 5" x 8" cards for names, several pieces of electric light wire, a supply of problem sheets, and sufficient "How to Instruct" cards. Arrange the chairs around the table if there is one. If not, arrange them in a U shape. Don't let your members' first impression be one of a "classroom." Remember, in starting this job it is your responsibility:

- "to have the right tools, equipment, and materials"
- "to have the work place properly arranged."

Time Table

(Allow 25 min.)

I. OPENING the Session.

References

1. Establish informal atmosphere and put group AT EASE. — Pages 45–46

2. NAMES.—Identify yourself and get members' names and company or companies. Explain your own industrial connections. Use folded cards for displaying names where appropriate.

3. DISCUSS THE SUPERVISOR'S FIVE NEEDS

   In these meetings we are going to use the term "supervisor" a great deal. Some of you are supervisors, some of you perhaps are instructors. When you instruct, you are performing a supervisory function.

   "For the purpose of our discussions when we refer to the supervisor we mean anybody in charge of people, or who directs the work of others."

(over)

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

Good supervisors have always realized that they have five needs.

Let's take a look at these needs. They are:

"1. knowledge of the work
"2. knowledge of responsibilities
"3. skill in improving methods
"4. skill in leading
"5. skill in instructing"

NOTE: Count the five needs on your fingers as you enumerate.

"1. Knowledge of the work refers to the kind of information which makes your business different from all other businesses:

material tools operations
machines processes technical skill

Some people have spent their lifetimes in their work and are still acquiring knowledge of their work. If they move to another industry, a new knowledge of work has to be learned.

We are not going to attempt to meet this need in these sessions.

"2. Knowledge of responsibilities refers to the particular company situation regarding:

policies safety interdepart-
agreements rules mental re-
regulations schedules lationships

These are different in every company or plant. Hence this knowledge of responsibilities must be supplied locally.

Time Table

References

Every supervisor to do his job must have a clear understanding of his authority and responsibilities as a part of management.

These local responsibilities are the 'ground rules' under which every supervisor has to work—but we are not going to attempt to meet this need in these sessions.

"3. Skill in improving methods deals with utilizing materials, machines, and manpower more effectively by having supervisors study each operation in order to combine, rearrange, and simplify details of the job.

This skill is practiced in Job Methods sessions.

"4. Skill in leading helps the supervisor to improve his ability in working with people.

There are basic principles that, when applied day in and day out, will tend to keep relations smooth and prevent problems from arising.

"5. Skill in instructing is concerned with helping supervisors develop a well trained work force:

have less scrap, rework, and rejects
have fewer accidents
have less tool and equipment damage

This skill is practiced in Job Instruction sessions."

(over)

Time Table

STRESS THE FACT THAT SKILLS ARE ACQUIRED BY PRACTICE

References

The supervisor is not born with these skills but he must acquire them by actual practice individually.

In these five 2-hour sessions, we will discuss the skill in instructing which we shall call Job Instruction.

Those who successfully complete this program will receive a certificate of recognition from the War Manpower Commission.

4. WHAT THIS IS ALL about:

   - "I am <u>not</u> here to tell you how to run your jobs; I don't necessarily know anything about your technical jobs."

   - "I am here to discuss <u>one</u> problem common to all—JOB INSTRUCTION."

   - "I was on your side of the table a few weeks ago—was sold and am now enthusiastic—have applied plan to my job—consider it REAL PRIVILEGE to have part in passing the plan on to others."

   - This is a WAR of PRODUCTION. The armed forces must have fighting equipment—in overwhelming quantities to achieve victory in the air, on the land and on the sea. Page 47

5. There are three major groups to be trained: <u>Millions</u> of PRESENT EMPLOYEES must learn new or higher skills EVERY DAY, as a result of:

   - Engineering changes.

   - New machines.

   - New types of jobs.

   - New and higher inspection standards.

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

- Promotions.
- Transfers.
- All kinds of new production requirements.
- SEVERAL MILLION present employees were taken on during the past year. Are they all working up to standard?

Hundreds of thousands of NEW EMPLOYEES must be trained.

An unknown number of DISPLACED EMPLOYEES in non-essential industries must be transferred to active war production;

25 min. to here

- must be trained to do, in many cases, totally different kinds of work.

(Allow 20 min.)

6. WHY TRAINING IS VITAL to every supervisor, every experienced employee. Pages 47–48

- Do you have people from these groups in your department?
- "Are they causing you any problems?"
- Distribute PROBLEM SHEETS; explain these are problems volunteered by men like themselves in several hundred war industries. Page 49
- Review sheets with two main questions:

  (1) Does this group have similar problems?

  (2) "Could these problems be solved or helped if the work force were better trained?"

- Bring out CLEARLY that about 80 percent of problems of this kind can be solved or helped if he has a better trained work force. More and more of the "experienced employee's" job is training.

Time Table

References

- Competence as a GOOD TRAINING MAN is one of the MOST IMPORTANT qualities of a supervisor. Everyone can PERSONALLY gain much from this program.

7. WHAT IS THIS PROGRAM?

- TRAINING is a broad field, composed of many phases.

- ONE PHASE only is to be discussed at these sessions, namely:

Job Instruction
or
How to get A man to do A job
correctly
quickly
conscientiously

Place on blackboard

- Getting EACH man to do EACH job correctly, multiplied by all the men in the department, represents much of the ANSWER to WAR PRODUCTION.

45 min. to here

(Allow 10 min.)

II. DEMONSTRATE FAULTY INSTRUCTION.

Pages 50–52

NOTE: Use THREE different members; 1 for telling, 1 for showing, 1 for correct instruction.

1. Intrcduction to "faulty instruction."

- Ask:

  - "How do we get A man—NEW or EXPERIENCED to do A job?"

- Make statements:

  - "TELLING a man how to do a job may be an excellent means of instruction when used PROPERLY. But it has limitations—and much scrap and grief can result from this method when used alone."

  - "To point out the limitations of TELLING, a simple illustrative job will be used. This job is from the electrical trade—the FIRE UNDERWRITERS' KNOT."

Time Table

References

- "This job is only an EXAMPLE. You should observe it in terms of YOUR JOBS in YOUR departments."

- Explain you are "taking apart" the process of instruction and examining each part separately.

- Select a member near you: Do not ask him to stand. Turn to him. Address him personally.

- Ask:

  - "Do you know how to tie the knot?" (If he knows, turn to another.)

  - "Let me TELL you how to tie a fire underwriters' knot. Listen closely."

Note to Trainer: Put your HANDS IN YOUR POCKETS: Have wire in table drawer or your pocket. Don't have wire in sight.

2. TELL the member how to tie the fire underwriters' knot, slowly, accurately, and IN DETAIL. Pages 50–51

   -Then hand the member the cord and ask him to tie it.

   -After he tries to tie it, twist loose ends back together and LAY WIRE ON THE TABLE. Don't hold it or fuss with it!

3. Point Out:

   -Failure was NOT the member's fault.

   -TELLING, alone, is NOT GOOD INSTRUCTION.

   -Most people just don't "get it" through "telling."

   -Many operations are difficult to describe in words.

   -Few of us can use the exact words necessary, anyhow.

Time Table

References

- Things seem "complicated" when listening to words.
- It's hard to "tell" the right amount and know whether it is "going over."
- And many other reasons known by most of us when we stop to think of it.
- MUCH OF THE INSTRUCTION IN THE SHOP IS TELLING—THOUSANDS OF WORKERS ARE BEING TOLD AT THIS VERY MOMENT. HOW MANY OF THEM REALLY UNDERSTAND?
- "This kind of instruction is the real cause of some of the problems on the problem sheet."
- Emphasize that IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.

55 min. to here

(Allow 10 min.)

4. SHOWING is another common means of instruction in the shop.

Pages 51–52

- It also is an excellent method when used properly. But it also has limitations—and serious ones.
- Explain again that you are "taking apart the process of instruction and examining each part separately."
- Turn to another member near you. Do not ask him to stand. Address him personally.
- "Do you know how to tie the knot?" (If he knows, turn to another.)
- "Again this sample job is only an EXAMPLE.
- "Think of it in terms of YOUR OWN JOB in YOUR OWN DEPARTMENT."

5. SHOW member how to tie the knot, by doing it once in front of him.

NOTE: BE SURE he sees it BACKWARDS. DON'T EXPLAIN—REMAIN ABSOLUTELY SILENT.

- Then hand the cord to the member and ask him to tie it.

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

NOTE: If he ties it, but backwards, this is just as useful as though he failed to tie it. If by chance he ties it correctly, compliment him, and turn to another member.

After member completes trial, untie knot, twist loose ends back together and LAY WIRE ON THE TABLE. Don't hold it or fuss with it.

6. Point Out:

- Failure was not the member's fault.
- SHOWING, alone, is NOT GOOD INSTRUCTION.
- He saw the knot tied backwards.
- Even when seeing a job from the proper angle, most people don't "get it."
- Most of us just "copy motions"; this doesn't mean we understand.
- Many motions are hard to copy.
- "Tricky points" are missed.
- We don't know what to look for.
- We can't translate what we see into what we should do.
- COUNTLESS THOUSANDS OF EMPLOYEES ARE BEING SHOWN HOW TO DO THEIR JOBS AT THIS VERY MOMENT. HOW MANY OF THEM UNDERSTAND?
- "This kind of instruction is the real cause of some of the problems we saw on the problem sheet."
- Emphasize that IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.

(over)

Time Table

References

7. Point out:

   - Men can learn their jobs with enough "telling and showing," but:
   - These are not SURE and DEPENDABLE methods.
   - There is a SURE and DEPENDABLE method that works EVERY TIME, if it is but applied.
   - This method represents the outgrowth of 25 years of test in the shops of the country.
   - It was formulated by practical industrial men.
   - It is being made available to all war industries.

1 hr. 5 min. to here

(Allow 15 min.)

III. DEMONSTRATE CORRECT INSTRUCTION.

Pages 52–55

Announce:

1. "We are now going to 'take a look at' the correct 'sure-fire' method."

   Explain setting:

2. "I will be a 'lead man' in an electrical shop. This man has been in the labor gang for several months. He has been transferred to my group. I'm going to make an assembler of electrical equipment out of him. I'm allowing myself 5 days in which to do it. He is going to learn the first part of his new work—the fire underwriters' knot—now."

3. Select another member, and have him come up in front of the group.

   Ask group again to note the method of instruction, NOT the job of knot tying.

4. GIVE CORRECT INSTRUCTION.

   NOTE: All your following work depends upon how well you do this job. Do it PERFECTLY.

Time Table

References

-Follow the FOUR BASIC STEPS.

↓

1 hr. 20 min. to here

-Do a complete, correct instructing job in this demonstration. Make EACH of the FOUR STEPS stand out clearly and distinctly. Make the key points stand out.

(Allow 35 min.)

5. STRESS that the successful instruction followed a definite but simple plan.

6. Establish the FOUR BASIC STEPS.

-Draw out by brief discussion what the instructor did in each step.

NOTE: To the extent you can, cite examples from your own experience to illustrate some of the points as you put them on the board.

-List subheads for Step I first, then the Step. Do the same for the other 3 steps. Follow the "How to Instruct" card. Get <u>every</u> point on the board.

-Discuss briefly WHY each subpoint cannot be left out, and WHY it is a part of a particular step and not of another.

-Stress: IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.

NOTE: Following are the FOUR STEPS to be placed on the board.

STEP I. PREPARE the worker.
Put him at ease.
State the job and find out what he already knows about it.
Get him interested in learning job.
Place in correct position.

Time Table

References

STEP II. PRESENT the operation.
Tell, show, and illustrate one IMPORTANT STEP at a time.
Stress each KEY POINT.
Instruct clearly, completely, and patiently, but no more than he can master.

STEP III. TRY OUT performance.
Have him do the job—correct errors.
Have him explain each KEY POINT to you as he does the job again.
Make sure he understands.
Continue until YOU know HE knows.

STEP IV. FOLLOW UP.
Put him on his own. Designate to whom he goes for help.
Check frequently. Encourage questions.
Taper off extra coaching and close follow-up.

1 hr. 55 min. to here

(Allow 5 min.)

IV. CONCLUDING THE SESSION.

1. Distribute "How to Instruct" cards.

2. Explain that the following sessions will be devoted to "learning by doing" in which each member will be given opportunity for practice in actual instruction.

3. Call for two volunteers (three if there is likelihood of absence) to put on instructing demonstrations at the next session.
   - Ask these volunteers to remain after the session for further directions.

4. If time permits, ask the remaining members to state the jobs they will "bring in" at the later sessions. (Often this whole question can be settled at the end of Session I so that only a review of jobs chosen is needed at the close of Session II.)

2 hrs. to here

5. Close the session promptly at scheduled time with appropriate remarks.

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

6. Discuss the following points with the volunteers after the session is closed: References

   a. Tell them to instruct just as they normally would on the job, using the 4 steps as best they can, but without any special preparation.

      Explain – their demonstrations are ONLY to HELP YOU bring out convincingly the normal mistakes most EVERYONE makes, so you can "put over" the "get ready" points.

      Tell them to expect many technical criticisms. These are just "part of the program" – not personal in any way.

   b. Choose an actual job that can be brought into the meeting – no tricks or puzzles.

   c. Choose a SMALL UNIT that can be done in 10 to 15 minutes. However, if the volunteers are inclined to choose too long jobs, let them do so. This will provide a good point for you to comment upon at the next session. (Of course, be prepared to STOP each of the demonstrations at the end of 15 minutes to avoid taking up too much time in the next session.)

   d. Have them bring in all necessary tools, equipment, and supplies.

   e. Explain again that they are "part of the standard program" to bring out some points. Thank them for helping you – and the program.

Sessions Outline

Session II

BEFORE the Session starts:

Be there 15 minutes ahead of time. Write the FOUR STEPS (with sub-heads) on the blackboard. Be sure that chairs are arranged around a table. If no table is available have chairs arranged in a U shape. Have a supply of job breakdown sheets, sample completed breakdowns and time table, some blank sheets, and several pieces of wire.

Time Table		References
(Allow 5 min.)	I. OPENING the Session.	
	1. Greet group, expressing gratification at their interest in improving WAR PRODUCTION through better JOB INSTRUCTION, as evidenced by their presence.	
	2. By appropriate remarks create INFORMAL ATMOSPHERE and put GROUP AT EASE.	
	3. Review first session briefly.	
	4. Emphasize keynote:	
	IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.	
	II. VOLUNTEER INSTRUCTION DEMONSTRATIONS.	
	1. Announce that, for the FIRST hour, the FOUR STEPS of instructing will be demonstrated by two group members, who will instruct other members how to do new jobs.	

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

- Explain that these volunteer demonstrations are NOT expected to be perfect, that they are put on to bring out some fundamental points to be discussed at this session.

- Ask members to take their "How to Instruct" cards and note how nearly the sample job-instructions follow the correct procedure.

5 min. to here

(Allow 15 min.)

2. Ask for a volunteer to be the "learner" for the first job.

   - Be sure the "learner" does NOT already know the job.

NOTE: KEEP CLEARLY IN MIND WHAT YOU ARE LOOKING FOR:

- *You are seeking to have members PROVE TO THEMSELVES that instruction on the job can only be done properly when instructors GET READY to instruct. The sole purpose of these two demonstrations is to SELL THE NEED AND NECESSITY that Supervisors do definite planning BEFORE instructing.*

Jot down on a breakdown sheet, steps and key points as nearly as you can catch them as the demonstration is put on.

LOOK FOR these points, in particular, during the demonstration:

- *IN STEP I:*

  - *Was the instructor's attitude toward the man constructive?*

  (Don't look for anything more in Step I at this stage of the program. It isn't the point you are trying to emphasize.)

Time Table

References

Page 66

– *IN STEP II:*

LOOK FOR COMPLETENESS, CLEARNESS, and ORDERLY PRESENTATION.

– *List steps and key points in STEP II so that key points checked in STEP III will appear directly opposite them on the page. Use form shown on page 66.*

– *Leave blank spaces where the instruction is "hazy," or something appears to be omitted.*

– *Note places where the instructor "back tracked," or brought in new ideas at the "wrong place," or "jumped about" from one point to another.*

(*STEP II is THE most important step to look at to bring out the need for breakdowns.*)

– *IN STEP III:*

LOOK FOR COMPLETENESS OF CHECK, and HOW NEARLY THE POINTS CHECKED. FOLLOWED THE POINTS PRESENTED.

– *List key points in Step III opposite those brought out in Step II, to the extent they can be "matched up" at all.*

– *Look for new ideas presented in Step III that were omitted in Step II.*

– *Look particularly for the key points that were missed, or not stressed, or not checked clearly.*

– *Try to find several key points on which the worker was not instructed, so you can stress: IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.*

Time Table

References

– *IN STEP IV:*

– *Did the instructor designate someone to whom the worker should go for help?*

Don't look for more in this step. You are only trying to establish the need for job breakdowns. (End of note to Trainer.)

20 min. to here

(Allow 5 min.)

3. COMMENT on the Demonstration:

a. Ask the volunteer: Do you think your instruction would have been better if you had had more time to plan?

b. Ask the group to comment on the demonstrations.

NOTE: Don't expect the comments to be particularly helpful for your purpose.

c. Bring out the discrepancies, errors, and omissions you have observed which they missed.

NOTE: SMILE as you criticize—always.

– Point out that the job was "too big" for one unit, if such was the case.

– Bring out any trade or technical terms that were used, but not explained.

– Point out lack of orderly presentation.

– ASK THE "LEARNER" QUESTIONS ON POINTS THAT WERE NOT MADE CLEAR BY THE INSTRUCTOR.

d. Explain again that the volunteer was good enough to "give us a picture of how we really instruct on the job." Explain that he knew your purpose in advance, and that your comments were SOLELY to bring out the PROBLEMS and FAULTS in instruction. They were NOT directed at the volunteer personally. THANK him for his help.

25 min. to here

(over)

References

(Allow 20 min.) 45 min. to here

4. Call on the SECOND volunteer and handle this demonstration in the same way as the former one.

(Allow 5 min.)

5. CONCLUDE that jobs must be "thought through" more carefully, before instructing.

   - We "think" we know a job when we really don't.
   - We KNOW IT SO WELL that we overlook the points that "stump" the learner.
   - We often KNOW IT SO WELL that we don't PLAN how to put it over to another.
   - These weaknesses, unfortunately, are almost universal.
   - They are typical of most of the instruction in the shop at this very minute.
   - These demonstrations were probably BETTER than the instruction being given throughout industry.
   - Thank volunteers again for having helped bring out these points.

50 min. to here

   - Conclude with, "We need more than just the four steps to get jobs 'over' to workers."

(Allow 15 min.)

III. WHAT an instructor should do to GET READY to instruct.

1. Ask members to turn to the "How to Get Ready" side of the card.

2. Read the first Get Ready point "Have a Time Table."

   NOTE: Don't elaborate. Explain that this point will be discussed fully during the next session.

Time Table

References

3. Read the next Get Ready point, "Break down the job."

   - Announce that for the next hour the group will work on job breakdowns. This "get ready" point requires special attention.

   - The two volunteer demonstrations would have been better had breakdowns been made.

4. Stress as they apply any or all of the following:

   - The instructors wouldn't have tried to put over too much.

   - The information would have been presented more clearly.

   - The instructor wouldn't have "jumped about" from one point to another.

   - The "critical" or "important" or "key" points would have been made clear.

   - (or whatever points should be stressed)

   - Conclude with, "Lack of clearly organizing the job in one's mind is the reason for poor instruction, scrap, accidents, delays, mistakes, discouraged workers, in fact all of the problems on the sheet we looked at at the last session."

5. Break down the fire underwriters' knot.

   a. Here's a quick simple way to make a breakdown.

   b. Explain that here is what you did to get the fire underwriters' knot clear in your mind before instructing.

   NOTE: Pass out blank Breakdown Sheets and explain headings, important steps, and key points.

Time Table

References

c. Take wire and go to the board.

- Write down headings PART and OPERATION. Fill in.
- Do the first important step, then write it on the board.
- Do the second important step, write it down, and so on through.
- Then tie the knot again, step by step, bringing out each key point. Ask yourself aloud the three questions for each step and answer them yourself.

d. Establish the breakdown on the board in numbered steps as follows:

Part: Twisted Lamp Cord	Operation: Tie Fire Underwriters' Knot
Important Steps	Key Points
(1) Untwist and straighten	6 inches.
(2) Make r. h. loop	in front of main strand.
(3) Make l. h. loop	pull toward you. under stub. behind main strand.
(4) Put end through loop	
(5) Pull taut	ends even, knot snug.

Time Table

References

e. Discuss the breakdown.

- Purpose is NOT to:
  - cover every conceivable step, point, motion or precaution.
  - or write a description of the operation.
  - or provide instruction sheets for employees.
- Purpose IS to:
  - help organize the operation in the instructor's mind.
  - be sure of the one best way the operator should do the job.
- It is just "a note from ourselves to ourselves."

6. What is an "Important Step."

a. An important step is a logical segment of the operation when something happens to ADVANCE the work.

For example, in putting a blade in a hacksaw:

- "Take hold of the wing nut" is NOT a step worth noting as a reminder.
- "Screw down wing nut" is a step, but not an important step.
- "Adjust the tension" is the IMPORTANT STEP.
- "Adjusting the tension" is the real thing that happens. It is unnecessary to go into greater detail.

Time Table

References

These breakdowns are not hair-splitting micro-motion studies. They are just SIMPLE, COMMON SENSE reminders of what is really important to "put over" in a job.

b. Read to the group part of this possible detailed description of numbered steps of the knot operation as a means of showing later how simple breakdown reminders can be. Stress that these are all the steps, not just the important steps.

Steps in Tying Fire Underwriters' Knot

(1) Pick up wire.

(2) Hold with left hand, between thumb and first finger, 6 inches from the end.

(3) Untwist loose ends, forming a V.

(4) Straighten loose ends between thumb and first finger of the right hand.

(5) Hold wire at the beginning of the V.

(6) Take the right-hand loose end with right hand, making clock-wise loop, bringing loose end across in front of the main strand.

NOTE: Usually this is far enough to read.

(7) See that loop is about 1 inch in diameter and stub protrudes to left of main strand about 2 inches. Hold the wire at the junction of the loop and the main strand.

(8) Take other loose end with right hand.

(9) Make counter-clockwise loop. To make this loop, pull wire forward, pass it underneath stub, behind main strand.

(10) Pass the loose end through right-hand loop, from back to front.

Time Table

References

(11) Hold ends evenly between thumb and first finger of right hand.

(12) Pull knot taut.

(13) Shape knot between thumb and first finger of left hand as it is pulled taut.

- Point out that there were 13 steps and 163 words in this detailed description, and only 5 important steps and 36 words in the brief, correct breakdown. The instructor might use the full 163 words in explaining the knot—or 200 or 300. But to GET STRAIGHT IN HIS OWN MIND just what the operation is, the 36 words are all he needs.

7. What is a "Key Point"?—Review quickly.

- Large portion of every job is easy to learn.

- It is the 5 or 10 percent that represents the "hard" or "tricky" parts. These require the time to learn—represent the real skill necessary.

- "Key point" was the term chosen to represent whatever is the "key" to doing a step properly.

- Key points mean, in their order of importance:

(a) Those things that "make or break" the job.

(b) Hazards (in many jobs these rank first).

(c) Things that make the work easier to do—"knack," "trick," "feel," "savvy," "special timing," "bit of special information."

(over)

Time Table

References

- Key points do not mean every conceivable thing that is to be watched, or which might go wrong. There is no need to go that far into detail.

Knowing what key points are and how to pick them out quickly and easily is perhaps the MOST IMPORTANT single thing in Job Instruction.

Examples of key points (cite as appropriate):

- "Feel." When putting a micrometer on a piece of stock, the key point is "how tight"— a matter of "feel."

- "Knack." When riveting, an important point is to know when to remove the pneumatic riveter. The "key" to this point is to listen to the riveting. The sound will change when the pieces are solidly together.

- "Timing and placing of heat." When welding there are, among others, two main key points: (1) apply the flame ahead of the weld and (2) get the metal the right heat, a matter of observing the color and behavior of the metal.

- "Hazard." When using a knife, a key point is to "cut away from you." When lifting a load with an overhead crane, a key point is to pull the chains or cables up taut, then hesitate for a moment to check the hitches, before lifting the load.

- "Special motion." When catching hot rods shooting out of rolling mills, the key point is to swing quickly the flowing rod in an arc away from you before inserting the end in the next set of rolls.

- "Special information." On some kinds of electrical wiring the key point is to attach the identified negative wire to the tinned screw, and the positive wire to the brass screw.

Time Table

(1 hr. 5 min. to here)

"Knack in judging sound." In mines, the strength and safety of the roof is determined by tapping the roof rock with a steel bar. The "sound" as the bar strikes the roof tells the story. Judging the sound is the key point.

References

(Allow 35 min.)

8. Break down on the board one of the volunteer demonstration jobs—the simpler one first.

   Use the following procedure:

   Help him identify the part and operation and have him write it on his breakdown sheet. (You write it on blackboard.)

   Have him start doing the job.

   When the job has been advanced (the first important step) have him tell you what was done. Have him write the first important step on his breakdown sheet. (You write it on board.)

   Continue same procedure until unit is complete.

   Have him do the first important step again, and ask himself the three key-point questions.

   Have him write the key points on his breakdown. (You write them on board.)

   If he seems to be missing details that are key points, "smoke out" with such questions as:

   Does it make any difference if - - - - ?

   What would happen if - - - - ?

   Why did you - - - - ?

   Continue until all the important steps are finished.

   NOTE: Have members copy the breakdown on the sheets provided them as it is developed.

Time Table

References

9. Break down the other volunteer job.

10. Summarize:

- Make clear the difference between a STEP and a KEY POINT.

- Make clear that FEW WORDS are required.

- Make clear that breakdowns can be done EASILY and QUICKLY after a little practice.

11. Stress value of "breaking down" operations on which they instruct.

Distribute sample job breakdowns and time table. Pages 56–57

Discuss Samples 3 and 3A.

Stress:

Everyone should make his own breakdowns.

Actually do the job.

List the important steps.

Find the key points.

What makes or breaks the job?

Injures the worker?

Knacks that make the work easier to do?

- Breakdown sheets are NOT to be given to workers. They are for the instructor's own use in CLARIFYING and ORGANIZING his own thinking about the job.

(1 hr. 40 min. to here)

- Finished breakdown sheets might be kept for ready reference.

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table (Allow 5 min.)

IV. Have Everything Ready and the Work Place Arranged.

References

1. Refer group to "How to get ready" side of the card.

2. Read the last two "get ready" points, "Have everything ready" and "Have the work place properly arranged."

   Point out:

   - That the foreman, leadman, experienced worker should SET THE RIGHT EXAMPLE for every worker.
   - Makeshift tools should not be used.
   - Apologies for using wrong equipment hurt a worker's respect for his leader.
   - Lack of materials or "forgetting" something makes for poor work standards.
   - Poorly arranged bench, or cluttered up tool chest, or desk piled with papers, or any single thing that is wrong sets a poor example to employees.

3. Discuss the above points briefly, pointing out that:

   - These are well-known failures.
   - Nothing new in them.
   - OFTEN OVERLOOKED, however, because they appear small and unimportant.
   - We should never be so busy that we can't SET THE RIGHT EXAMPLE for employees.
   - That's what foremen, leadmen, and instructors are on their jobs to do.

(1 hr. 45 min. to here)

(Allow 15 min.)

V. SUMMARY and discussion of NEXT SESSION.

1. Summarize the "get ready" points by stressing that they should and can be done quickly. Often they can all be done in but a few minutes.

(over)

Time Table

References

2. Refer to "How to Instruct" cards, pointing out that the two sides outline the WHOLE Job Instruction plan.

3. Each member, including the two volunteers at this session, should select a SIMPLE JOB from those he actually supervises and be prepared to "put it over" at the next session.

   a. Announce that as many members will demonstrate instruction at the next session as time will permit, and the rest at the following sessions.

   b. Have each member state the job he intends to use as his practice demonstration.

      - If job selected is too big a job for simple demonstration, help member to select a simpler job.

      - Each member should plan to use a job that will consume no more than a 15-minute period.

      - Each should bring all necessary tools and supplies to provide for ample "practice" in Step III.

   c. Be sure each member understands that the complete, correct instruction procedure is now expected, i. e.:

      - The four "get-ready" points, particularly the job breakdown. Make clear: Each member should bring his COMPLETED breakdown sheet.

      - The "four steps" used in the instruction itself.

Time Table

References

4. Close meeting with BRIEF "SALES" STATEMENT on personal advantages of becoming good instructors.

   a. The following practice and drill sessions will enable them to "get the feel of the instructing tools."

   b. Practice will develop in them the correct instructing habits so that effective instructing methods will "come natural" to them.

(2 hrs. to here)

5. Adjourn meeting promptly at scheduled time.

Sessions Outline

Session III

BEFORE the Session starts:

Be there ahead of time. Have a supply of breakdown sheets for yourself and all members. Have chairs arranged properly.

Time Table		References
(Allow 30 min.)	I. OPENING the Session.	
	1. Review briefly:	
	– FOUR things necessary to GET READY to instruct, particularly the Job Breakdown.	
	– FOUR BASIC STEPS of instruction.	
	II. Present Time Table.	
	1. Now the group will work with the first "get ready" item on the card—"Have a Time Table."	
	– Refer to previous mention of Time Table in Session II.	
	2. Discuss quickly:	
	– How much skill should the workers have?	
	– By what date?	
	– So that the training of workers can be done by PLAN and not by ACCIDENT.	
	– WHO should be trained?	
	– for WHICH job?	
	– by WHAT date?	
	3. Here is a QUICK, EASY way to make a training time table for your force.	
	– Distribute blank sheets of paper.	
	– Go to the board. Build up the form—do not ask group to discuss—present it.	
	– Draw chart lines quickly on the board. Ask members to draw lines on blank sheets.	Page 56
	NOTE: Use dates from current calendar.	

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

- "Here are a few operations for which one supervisor is responsible. Let's use them to illustrate how to make a TIME TABLE."
- "Your jobs will be different, of course. The idea works out the same everywhere, however."

4. Fill in at the top of sheet and explain purpose.
   - The supervisor's name—Bill Smith.
   - The supervisor's department—Machining.
   - The date - - - - 2/1/44.
5. "Next, Bill Smith filled in the jobs in his department across the top. They were DRILL, BORE, REAM, FACE, TAPER-TURN, BURR and BURNISH." (Place in time table.)
   - "In this case Bill's workers did a VARIETY of things. He listed the jobs his workers did.
   - "If his workers had all done the SAME thing, his headings would have been listed by:
     - 'classifications' or
     - 'levels of skill' or
     - 'types of machines'.
   - "For instance, if the workers were coremakers in a foundry, the job headings may be listed as 'small coremaker,' 'medium coremaker,' 'large coremaker,' and 'helpers'.
   - "Or if the department did only tapping, the listing may be by machines. For example, 'Boyce,' 'Bakewell No. 1,' 'Haskins,' etc."
6. Then put the workers' names down the left side—"White," "Nolan," "Black," "Jones," "Green," "Brown," and "Riley."
7. "Then, Bill Smith checked off the jobs each worker could do."
   - Establish the checks as follows (do not enter the dates as yet):

Time Table

References

Bill Smith Machining Dept. 2/1/44	DRILL	BORE	REAM	FACE	TAPER-TURN	BURR + BURNISH		
White	✓	✓	✓	✓	✓	✓		
Nolan	✓	✓	✓	✓	2/25	✓		
Black	✓	✓	✓	✓	✓	✓		Mar. 1 Induction
Jones		✓	✓			✓		
Green	✓	✓				✓		
Brown	✓	✓	✓			✓		
Riley	2/20					✓		

8. "Next, Bill reviewed the time table to see if there were any urgent training needs in his department.

   - "First he reviewed the list of workers for possible changes by:

     separations,
     promotions,
     transfers, etc.

   - "In this case he knew Black was scheduled for induction March 1 and made a note of it on the side." (Fill in "March 1, Induction," see Time Table.)

   - "Then he reviewed the list of workers again from the angle of POOR PERFORMANCE as indicated by:

     excess rejects,

     injuries,

     damage to equipment, etc.

   - "Bill felt his workers' performance was satisfactory.

   - "Finally he reviewed the job headings, considering:

     - How he was meeting present PRODUCTION QUOTAS in all jobs.

Time Table

References

- Whether there were any contemplated INCREASES in production.

- "Bill knew that a change was coming through in three weeks that would require one more man on the drilling operations.

- "He had 'spotted' two urgent training needs. Now he had to make plans to meet them.

9. "In considering WHO should be trained on WHICH job, and by WHAT date, Bill decided that:

   - "Riley was the logical man for the drilling job and he would have him trained by February 20. This would have Riley trained before the change took place." (Fill in date 2/20 in Time Table.)

   - "Black's induction would leave him short a man on Taper-turning. He selected Nolan as the logical person and set February 25 as the dead line for training him." (Fill in date 2/25.)

10. Review quickly the procedure for making a Time Table.

    - Identify sheet--supervisor's name, department, and date.

    - List job headings:

      A variety of things--list "jobs."

      All the same thing--list by "classifications" or "levels of skill," "machines," etc.

    - List workers' names.

    - Check off jobs.

    - Spot training needs. Review list of:

      Workers:

      Turnover

      Poor Performance

Time Table

Job Headings

References

Meeting present production quotas
Contemplated increases in production

- Plan to meet needs.

  - WHO should be trained
    on WHICH job
    by WHAT date

11. Summarize:

- Let's PLAN our training—don't just let them learn.
- When the "pressure is on" for production and men must learn new skills you often hear supervisors say:

  "It takes time . . ."

  "A lot of mistakes always happen . . ."

  "Let 'em learn, that's the only thing you can do . . ."

BUT

- The way to get results is to determine "HOW MUCH TIME"—then SHORTEN that time, if possible, through INTENSIVE INSTRUCTION. Don't be content with—"IT TAKES TIME."
- Time tables are easy to make. One can be put together in 10 to 15 minutes.
- They can be revised and brought up to date in five minutes.
- Time tables should be reviewed whenever any changes are coming in personnel, design, output, quantity, or anything that might indicate training is needed to keep production rolling.
- Conclude by driving home the thought that men's lives and the war production program depend on good PLANNING, and training is no exception. Workers must KNOW their jobs before they can PRODUCE. In training workers the important thing is "How short a time" not "it takes time."

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

30 min. to here

12. Have each supervisor start his own time table now. References

- Coach individually as you circulate around the table.
- Stop at end of time limit.
- Ask each to bring his own completed time table to the next session.

III. Explain Practice Instruction. Pages 58–66

(Allow 5 min.)

1. Announce:
   - Everyone should put on his "thick skin" because everyone is going to "do his stuff" before the group and invite criticisms and suggestions.
2. It is a real advantage to each member to get the benefit of others' comments, in a thoroughly FRIENDLY and HELPFUL atmosphere.
3. Explain how demonstrations and comments will be made.
   - Refer to "How to Instruct" cards.
   - Explain that members are now expected to follow the WHOLE PLAN—the FOUR GET-READY points, as well as the FOUR BASIC instruction steps.
   - Explain that you would like to look over each member's job breakdown sheet while he is instructing, just to see if he has "caught the knack" of breaking down a job—that you will return the sheets after each demonstration.
   - Ask each member to get his tools, supplies, and work place arranged just as he wants, and that after the instruction starts, any errors or "fumbles" will be commented upon.
     - Each member should describe the SHOP setting of his job before he starts, i. e. –
     - Whether he is foreman, leadman, or what.

(over)

Time Table

References

- Whether man is experienced, being transferred, or green.

(35 min. to here)

- *Pass out blank breakdown sheets. Ask members to jot down what they can "catch" of STEPS and KEY POINTS.*

IV. PRACTICE INSTRUCTION (3)

(Allow 15 min. for each demonstration and about 10 min. for comments)

1. Call up one member to put on his instructing demonstration.
2. Call for volunteer to serve as "learner."

   NOTE: See that each member serves as the "learner" in one demonstration. See that the "learner" does NOT know the job, wherever possible.

3. Ask the "instructor" for his job breakdown sheet.
4. Have him carry through his demonstration.
5. Comment on the demonstration.

   - Use the standard procedure for constructively commenting on practice demonstrations. Pages 58–66

   NOTE. If "special instruction problems" are involved, discuss. Pages 67–70

6. Call up SECOND member.

   - Continue as before, except gradually be more exacting in a friendly way.
   - Stress STEP III more and more. INSIST that the learner do the job and EXPLAIN the key points.
   - Suggest that member use the following "lead-in" or one accomplishing the same purpose, when he asks the learner to do and explain:

     "Some of us find it easy to copy motions. This doesn't always mean we understand. Would you do the job again, and explain to me WHAT you are doing and WHY?"

Time Table

References

7. Call on the THIRD member for a demonstration.

   - Become MORE AND MORE EXACTING in a FRIENDLY way.

   - Have members stress STEP III. There is only ONE ANSWER to how much stress an instructor should give STEP III; namely, "CONTINUE UNTIL YOU KNOW HE KNOWS."

(1 hr. 55 min. to here)

V. SUMMING UP

(Allow 5 min.)

1. Have group tell you:

   - The FOUR GET-READY points.

   - The FOUR BASIC STEPS.

2. Suggest to the members who have not yet put on their practice instructing demonstrations that they review how they plan to GET READY in the light of the demonstrations they have witnessed.

   - The more carefully the instructor GETS READY the better the instructing job he will do.

3. Make some complimentary and ENCOURAGING STATEMENTS about the demonstrations that have been given in the session.

4. Point out the PERSONAL value in getting one's thinking about the job PLANNED and ORGANIZED.

(2 hours to here)

5. Adjourn the session promptly at scheduled time.

Sessions Outline

Session IV

BEFORE the Session starts:

Be there ahead of time. Have a supply of breakdown sheets. Be sure the chairs are arranged properly. NEVER let a "classroom" atmosphere develop.

Time Table	I. OPENING the Session.	References
(Allow 15 min.)	1. Express gratification at members' interest in WAR PRODUCTION as evidenced by their presence.	
	2. Have group TELL you: – The FOUR GET-READY points. – The FOUR STEPS of instruction.	
	3. Review again the TIME TABLE. – Have a member place a time table on board and explain. – Go over as many time tables as time will permit.	
15 min. to here		
(Allow 15 min. for each demonstration, 10 min. for comments.)	4. Continue PRACTICE INSTRUCTION (4). – Have members watch their "How-to-Instruct" cards as the demonstrations are put on. – Have them write down the important steps and key points of each demonstration on breakdown sheets.	
	5. Use STANDARD PROCEDURE for comments. Be more and more exacting in a friendly way.	Pages 58–66

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

NOTE: The following special problems may be brought out at any appropriate place in Sessions III, IV, or V.

6. Discuss three SPECIAL INSTRUCTION PROBLEMS encountered in many shops: Pages 67–70

   a. The LONG OPERATION.

      How to use the FOUR-STEP method on an operation that takes 3 hours or perhaps 3 days.

   b. The NOISY SHOP.

      How to use the FOUR-STEP method in a shop where it is too noisy to hear.

   c. Putting over "FEEL."

      How to instruct a man in that important thing—"feel." Demonstrate this point with a vise, nut and bolt, micrometer or some similar example.

1 hr. 55 min. to here

(Allow 5 min.)

II. SUMMING UP.

1. Resell the ADVANTAGES of becoming a good instructor. Pages 70–71

2. Stress importance of production and accuracy. Point out that the lives of the soldiers, sailors, aviators—people just like ourselves—depend upon perfectly operating parts of airplanes, tanks, ships, guns.

3. Stress that what the Instructor says to or does with a workman doesn't count—unless it sticks. What sticks in the Worker's mind is the NET RESULT that counts.

2 hrs. to here

4. IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.

(over)

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Sessions Outline

Session V

Time Table

References

I. OPENING the Session.

1. Make appropriate remarks at the beginning of this, the last session.

(Allow 5 min.)

II. PRACTICE DEMONSTRATIONS (3)

1. Following same procedure as at previous demonstration periods, complete the practice demonstrations of remaining members. Be more and more exacting, in a friendly way. LET NO SIGNIFICANT ERROR GO UNMENTIONED IN THESE LAST DEMONSTRATIONS.

(Allow 1 hr. 25 min.)

1 hr. 30 min. to here

Pages 58–66

III. SUMMING UP.

(Allow 25 min.)

1. Express APPRECIATION for COOPERATION and interest of group.

2. Call for remaining QUESTIONS.

3. Restate URGENT need for WAR PRODUCTION and need for helping millions of employees improve their performance on their jobs.

4. Show savings in break-in time, scrap, manpower, tool breakage, etc. (Use latest figures available locally.)

5. Recall the problems discussed by the group in the first session that were grouped into problems of:

Production.	Safety.
Quality.	Personnel.

WORK FROM THIS OUTLINE—DON'T TRUST TO MEMORY

Time Table

References

a. Emphasize again that the only sure way that an instructor can gradually work himself out of them is through training. Otherwise he is nothing but a "trouble shooter," dealing with one emergency after another, and never getting them solved—never working TOWARD their permanent solution.

b. Point out that many supervisors think they don't "have the time" to train.

c. Emphasize that by "taking the time to train," the instructor won't have so many time-consuming "emergencies"; that training is the one "handle," as it were, that a supervisor can "take hold of" and do something about.

6. Urge consistent use of the FOUR-STEP method.

7. Clear up the following questions that may be in several members' minds, "JUST WHAT AM I TO DO ABOUT THIS?"

Pages 72-75

a. If the group is composed of lead men, gang bosses, experienced operators who personally instruct workers:

- Use this FOUR-STEP method constantly on the job—every time you "pass on the know-how" to a worker—every time he asks you a question or you check his work.

b. If they are foremen, inspectors, or higher-ranking supervisors who don't instruct workers personally:

- Use this method with your own assistants every time you put over a new idea, issue an order, or check a man's work.

- Arrange for all your subordinate supervisors and all who instruct workers in any way to take part in this 10-hour program, just as quickly as possible.

(over)

Time Table

References

- Encourage your men to use this FOUR-STEP method. All that can be done in 10 hours is to put "tools" in your men's hands. You superintendents, foremen, and others must see that the tools are used.

For example you can:

- Have each group leader break down three operations a week for a time, and review the breakdowns with his foreman.

- At regular meetings, i. e., staff meetings, production meetings, etc., discuss the use being made of the FOUR STEPS.

- As you see subforemen, group leaders, and others in the shop, ask them whether they are using the plan.

1 hr. 55 min. to here

8. Explain that if there are ANY QUESTIONS or PROBLEMS, members are to get in touch with their supervisors.

(Allow 5 min.)

9. Get expression of group as to whether the members are prepared to apply these instruction principles conscientiously as their part in the NATIONAL WAR PRODUCTION program. To the extent that is appropriate, develop this into a little ceremony and PLEDGE on the part of each member that he will put the FOUR STEPS to work.

10. Wish group success and adjourn meeting.

2 hrs. to here

11. Parting shot: IF THE WORKER HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT.

Reference Material

The use of this material in the Training Sessions is indicated by the marginal reference numbers.

The following material is prepared as a supplement to the information provided in the Sessions Outline. These illustrations and additional points are desirable to use to AMPLIFY and CLARIFY items in the Sessions Outline. Illustrations and stories of your own dealing with PRACTICAL APPLICATION of items presented are very desirable. NO item in the outline is to be omitted or changed, however. Amplification and illustration of such items ONLY are in order.

Putting the Group at Ease and Establishing Informal Relationship with Members

Establishing an informal atmosphere and putting a group of people at ease cannot be accomplished by simply making a statement that they be at ease.

The members of your group are apt to be uneasy mentally and somewhat concerned as to why they are present. In many cases they probably were assigned to attend the meeting. They did not volunteer.

The personal impression that you make during the first 5 or 10 minutes is a big factor because if it is favorable it makes the work easier to carry on. If it is unfavorable, you must make considerable effort later to overcome this impression.

Let the manner of your delivery, your tone of voice show clearly that you are in earnest, that you feel strongly about the importance of the work, and that you fully respect the present knowledge and experience of the group. Here are some ideas from which you can work out the opening talk.

1. Establish your own industrial background by briefly relating your own industrial connection—if this is done while writing or printing your own name on the blackboard, you can set a pattern which each will naturally follow.

   - Have each man then relate his own connection briefly, not so much to get the information, but to set him at ease since it is something that he can do correctly and easily.

   - Have each man print his name and department (or company, if several companies are represented) on a card which is placed before him at his position.

   - You can claim that your own inability to remember names makes this effort on their part a favor to you in conducting your work.

2. If plant regulations permit smoking, trainers may light a pipe or a cigarette, thus setting an example of informality. Remember, however, that a pipe or a cigarette can become a nuisance to you while trying to talk or write.

   - When you have set the example of informality, get rid of the pipe or cigarette until later in the sessions when it will not interfere with conducting the meeting.

3. Be sure to point out that with the present background of experience which the group possesses, anyone would be bluffing who presumed to be able to improve their practices or their working skill.

   - Your only purpose is to help them to make better use of what they now know. They were selected because of their own skill and experience; they probably know more about that than any other living person.

   - They certainly do know more about it than you do.

4. Avoid classroom atmosphere as members are mature and resent any suggestion of "school teacher and school boy" relationships. Avoid using such terms as "class," "student," "classroom," "teacher." Say rather "group," "worker or learner," "get-together," "meeting," "instructor," etc. TRAINING is a normal part of day-to-day supervision — not something "special" or "apart." Think and speak of a training meeting as any other meeting concerning PRODUCTION.

5. Tell them you are going to discuss shop problems—just as a group of shop men—nothing highbrow.

   - There will be a chance actually to try out the ideas and practices discussed, and a certificate will be issued to those who by full attendance and reasonably good performance have qualified as instructors.

6. Explain that not so long ago you were "on their side of the table," when you took this training yourself. You know it is not too difficult to "get on to" and have tried it out in practice; it does work. Your being in a position "to pass it along" is gratifying. It is a real privilege to be tied up with this activity.

This Is a War of Production

The United States is supplying an army of over 11,000,000 and providing war goods also to our allies. It is not just a question of supplies for a new soldier—there must be a constant stream of war goods, of food, of clothing to replace what is lost or used up.

German equipment is well-made. It takes much good equipment for our troops who encounter German troops.

More and more equipment is needed in the Pacific.

As production needs mount, production problems become more difficult.

Experienced men are being drained out of war plants. The production experience and the ability of new people who come into plants now are constantly lower. And this will get worse.

Training must therefore be better—it must fit these people into production quickly so that the stream of quality war goods does not slow down.

Why Training Is Vital to Every Supervisor and Experienced Worker

Distribute a problem sheet to each member, and give a short explanation of its purpose, i. e.:

- A quick means to visualize just where training can help remedy common shop problems.

- Not trying to explore <u>every possible</u> situation where training can be helpful. We will look at a small sample of current problems. Maybe no one has <u>all</u> of those shown on the list. Maybe he has others not listed here. For now, let us think a little about those listed.

- Some of the items are beyond the control of the individual members; others are directly in their control. Who is responsible is not the question. Where training can help is the ONLY purpose now.

Read each problem under "Production" and ask members to put a check mark against any they have.

- Then ask the group how many items have been checked. Get actual replies from, perhaps, 4 or 5 members.

- Explain carefully: "This is not an attempt to 'dig into' or 'expose' your problems. It is SOLELY to determine the usefulness of TRAINING as a part of EVERY supervisor's job."

Then read each problem under Safety and follow the same procedure as above.

Do the same for Quality and Personnel.

The whole purpose of the sheet is to stimulate more specific thinking about training on the actual jobs on which members are engaged.

Taking a little time now will give the members a better slant on the subsequent work of the instructing procedures.

Don't argue or carry on any lengthy discussions. The sole purpose of the use of the sheet is to focus attention on specific applications where training can profitably be used.

Keep in mind that these men live close to their own jobs. In the pressure of other things all of us lose sight of the fact that lack of proper training causes all the problems listed on the problem sheets and in fact many more.

Also remind the members that these drags on production are often found with workers who have been on the job long enough to be classed as experienced. They are not limited to new or green men.

After checking and discussing the items listed on the sheet, ask members how many of these particular items can be helped by better trained workers.

Close the discussion with the definite conclusion:

- That about 80 percent of these particular shop problems could be solved or at least helped if the supervisor had a better trained work force.

- That if a supervisor really wants to train his people, no one can stop him. If he doesn't want to train them, no one can make him give more than "lip service" to training.

HERE ARE SOME PROBLEMS THAT JOB INSTRUCTION TRAINING *HAS HELPED* SOLVE IN WAR PRODUCTION PLANTS

Do you have any similar problems on your job?

Production Problems

Deliveries delayed because of errors and mistakes by men making the parts.
Men don't know their jobs.
Mix-ups in trucking service.
Parts returned by other departments because they were not made right.
Operators have special problems because of engineering changes.
Poor planning.
Men have difficulty in getting up to production on new type equipment.
Aisles too congested.
Excessive wear and tear on equipment.

Safety Problems

Safety equipment not properly used.
Material not piled properly.
Poor shop housekeeping.
Don't know safety rules.
Men don't know hazards of their jobs.
Men get careless.
Minor injuries not reported.

Quality Problems

Meeting inspection standards.
Too much scrap or re-work.
Jigs and gauges not properly used.
Not following specifications.
Too much left to operator's judgment.

Personnel Problems

Men leave to other plants—couldn't "get the hang" of the job.
New men and women lack experience in mechanical things.
Lack interest in the work.
Men want transfers—think they can "make out" better on other jobs.
Claim to have good experience but don't "come through."
Too much time to get up to production.
Instructed wrong way.
Can't get experienced men any more.
Get discouraged learning the job.

Most supervisors say that somewhere around 80 percent of these problems could be solved—or at least helped—if they had a better trained work force.

How about yours?

Pointers on Making Faulty Demonstrations

The purpose of presenting a faulty instructing demonstration is to convince the members of the group that merely "telling" or "showing" a learner is seldom good instruction.

These suggestions for presenting a faulty demonstration of "How to tie a fire underwriters' knot" are to supplement the material in the Sessions Outline. First, you must know how to tie the knot yourself and be able to describe it clearly. See diagram.

Before starting the faulty demonstrations, be sure to use the "lead-in" idea as covered in the Sessions Outline, and emphasize that this knot demonstration is only illustrative--a simple job-- and should be applied to each member's own job.

You must carry out these demonstrations with a realization that from your first opening statement every move you make has a distinct and important purpose. The whole aim is to get the correct instructing procedure understood by the members.

You should be aware of the progressive build-up in this first session, which is to get in the mind of each member:

First -a realization of the acute need for training on the job;

Second-the importance of good instruction to a supervisor;

Third -some of the weaknesses we fall into in breaking-in workers (tell-show alone);

Fourth-the instructing process which is sure-fire and easier to use than the others.

Suggestions on "telling" how to tie the knot.

Speak slowly and distinctly so no criticism of your telling can be made.

1. Take a piece of ordinary twisted lamp cord.
2. Hold it vertically with your left hand, between the thumb and first finger, 6 inches from the end.
3. Untwist the loose ends, forming a V.
4. Straighten the loose ends between the thumb and first finger of the right hand.
5. Hold the wire at the beginning of the V.
6. Take the right-hand loose end with the right hand, making a clockwise loop, bringing the loose end across in front of the main strand.

7. See that this loop is about 1 inch in diameter and the stub protrudes to the left of the main strand about 2 inches. Hold the wire at the junction of the loop and the main strand.

8. Take the other loose end with your right hand.

9. Make a counter-clockwise loop. To make this loop, pull the loose end toward you, pass it underneath the stub, behind the main strand.

10. Pass the loose end through the right-hand loop, from back to front.

11. Hold the ends evenly between the thumb and first finger of the right hand.

12. Pull the knot taut.

13. Shape the knot between the thumb and first finger of the left hand as it is pulled taut.

Suggestions on "showing" how to tie the knot.

The Sessions Outline gives enough detail on "showing" to enable you to carry it on without further suggestions--if you can tie the knot.

Examples of Telling and Showing:

Here are some common examples proving that unfortunate results come from telling when a new man doesn't "get" the ideas:

1. Erecting a derrick on a construction job--The boss told a helper to slack off on a guy wire. What really was in his mind was to equalize the strain on all guys. The man loosened the shackle bolts completely and the whole strain of the mast was on the ONE guy. The derrick fell. Fortunately, no person was hurt, but hours of labor had to be used by an entire gang to get back to where they were before they were "told."

2. Remember the one about the boss in a repair shop "telling" the new worker to "go get the old man." Of course, an "old man" used by maintenance men is a tool—a portable rigging with an adjustable clamping device—which acts as a hand power drill press. Instead of a special rigging for drilling a hole in metal, he brought the superintendent! Considerable explaining was needed before the superintendent found out what had happened!

From your own experience, you can pick out illustrations of a similar kind.

-Do not overdo it, however. Your purpose is only to get a realization in the members' minds that mere "telling" is not a reliable way to instruct.

Similarly, "showing" can be brought out by concrete examples:

-Showing a man how to put plaster on a wall—it looks easy, but he puts the plaster everywhere except where it should be. It won't stick for him.

-Showing a man how to tie a package and break the twine—it looks easy, but he can be most awkward in handling the package and even cut his hand trying to break the twine.

-Showing a helper how to solder on sheet metal—it looks easy, but when the helper tries, everything goes wrong—sheets warp—solder won't stick, etc.

Selection of proper methods for an instruction job is as important as selection of proper tools for a mechanical job.

Completing a definite series of steps and operations in an instruction job is as important as following the steps outlined in an operation sheet for a shop job.

Pointers on Making a Correct Demonstration of Good Instruction in "How to Tie a Fire Underwriters' Knot"

So much depends on your putting on an ideal demonstration that you should be letter perfect in carrying it out.

Remember that every point you will stress later in both the breakdown and the use of the four basic steps must be covered by this one demonstration.

When well done, it is a background to which you can refer during the remainder of the sessions.

You will have to work out exactly how to emphasize each step.

BE SURE to "put over" your Steps and Key Points exactly as in the brief breakdown you will use in Session II. Naturally you will not cover every detail as you did in your "telling" demonstration.

When instructing your "worker" you may use the terms "clockwise" and "counter clockwise" or "right-hand" and "left-hand" loop, as you wish. The terms "clockwise" and "counter clockwise" are recommended; however, just because their use serves excellently to show that "peculiar," "local," or "tricky" terms and part names must be handled with extreme care. There are thousands of such terms throughout the shops of the country. Later in Sessions III, IV, and V you can explain to the group that you used these terms deliberately to illustrate this point. In the breakdown in Session II, r. h. and l. h. are used because these abbreviations are simpler to write.

Step 1. Demonstrating "Preparing" the worker:

a. Greet member naturally. Tell him he is going to assemble lighting fixtures for Army camps. The first part of that job he has to learn is the fire underwriters' knot.

b. Ask him if he knows what the fire underwriters' knot is used for. If he doesn't, show him a completed knot.

c. Illustrate how it functions to relieve strain on the wire connections in electrical fixtures. Stress that if HE does not tie the knot properly an Army barracks may burn.

d. If convenient have the man on the instructor's right, so he can now be moved to the left — just to emphasize "correct position" for this job.

Step 2. Demonstrating "Presenting" the new instruction to the Worker:

a. Untwist and straighten the two wires—hold vertically in left hand according to instructions. Stress the key point—about 6 inches for this job.

b. Make a loop with wire "B" (see Fig. 2). Stress that the loose end must lie across and in front of the main strand.

c. Make loop with wire "A" (see Fig. 3), and repeat slowly. Stress the three key points—pull toward you; pass wire under stub; and behind the main strand.

d. Put end of wire through first loop.

e. Demonstrate how to tighten the knot. Stress the two key points—ends even; knot snug (See Fig. 4.):

(1) You may have to repeat the demonstration, showing how fingers of left hand are used.

(2) Call attention to final appearance of knot.

(3) Show how to adjust knot to proper position on wire.

Step 3. Performance tryout:

a. Provide worker with a new length of wire.

b. Ask him to tie the knot—do not ask him if he would like to try it.

c. Stop him immediately if an incorrect procedure is discovered and correct it.

– Make sure he follows exactly what you presented. If he becomes confused, then show and explain correct procedure until the faulty movements are overcome.

- Question him to assure yourself that he does understand what you presented—if he missed it, go back far enough to make it clear.

d. Ask worker to tie the knot again, and explain to you WHAT he is doing and WHY. If he does not explain the key points, ask questions beginning with "why," "what," "where," "when," that will require a correct explanation.

e. Continue having him tell you WHAT he is doing and WHY until you know he knows the job. It may be necessary for him to tie the knot 5 or 6 times.

Step 4. Follow-up:

a. Ask him to go ahead with the job on his own.

b. Explain that if he gets stuck, he should see you—no one else. You will be available to help him.

c. Set up the situation as requiring the tying of the knot in 500 cords—a shop project.

d. Tell him you will return in a few minutes to see how he is getting along.

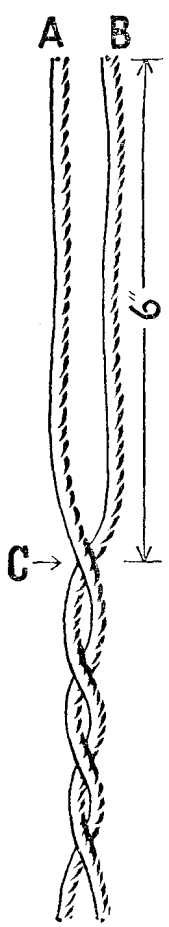

Fig. 1

Here is a pictorial description of the knot for your own use in becoming completely familiar with it. It is not for presentation in the sessions themselves.

How to tie a fire underwriters' knot, using standard 2-strand twisted lamp cord.

Steps in the Operation	"Key Points"
1. Untwist and straighten ends.	About 6 inches for this job. (Slight differences in length will not make or break the job.)
- Hold in left hand at point "C" (Fig. 1).	

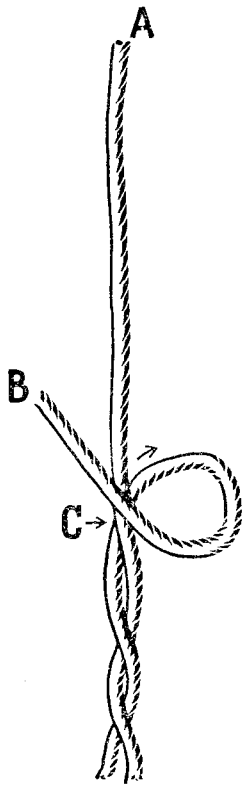

Fig. 2

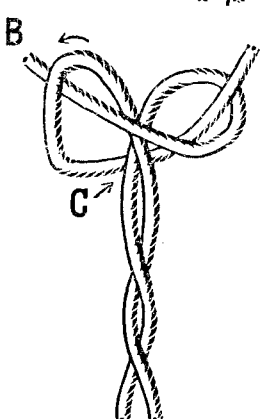

Fig. 3

Fig. 4

Steps in the Operation	"Key Points"
2. Make R. H. loop in right hand wire (Wire "B").	Cross in front of main strand (Fig. 2).
– Hold wire at junction of loop and main strand.	
3. Make L. H. loop of the remaining wire (Wire "A").	Pull toward you.
	Pass under stub protruding to left.
	Behind main strand.
4. Put end of wire "A" through first loop. (Fig. 3)	
5. Pull taut. – Take wire ends ("A" and "B") in finger and thumb of right hand and hold stranded wire at "C."	Ends even (Fig. 4).
– Use thumb and first finger of left hand to make loops lie neatly and snugly across the main strand, and to adjust the knot to approximately 6 inches from the ends of the wires.	Knot snug.

TRAINING WITHIN INDUSTRY SERVICE
BUREAU OF TRAINING
WAR MANPOWER COMMISSION

JOB INSTRUCTION

INDUSTRIAL
SAMPLE JOB BREAKDOWNS

Here are some examples of Job Breakdowns and a Time Table which have developed and used by War Production plants:

- Keep this sheet for reference.
- Start breaking down your own operations.
- Use these actual samples as a guide for your own breakdowns.

Example 1

TRAINING TIMETABLE

s is how one supervisor made up a TIMETABLE for training his Any jobs or units of a job can be worked out the same way.)

	Drill	Bore	Ream	Face	Taper Turn	Curr and Burnish	Etc.	Etc.	Etc.
e	✓	✓	✓	✓	✓	✓			
n	✓	✓	✓	11-10	–	–			
h	11-1	11-20	–	✓	✓	12-1			
s	–	–	✓	11-15	12-1	12-8			

✓ means the worker can already do the job.

– means he doesn't need to know the job.

11-1, 11-15, etc., indicates the dates the supervisor has set for himself when he plans to have his men TRAINED to do the jobs required.

Example 2

JOB BREAK-DOWN SHEET FOR TRAINING MAN ON NEW JOB

PART: Shaft OPERATION: In-feed grind on centerless grinder

IMPORTANT STEPS IN THE OPERATION Step: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might— Make or break the job. Injure the worker. Make the work easier to do, i.e., "knack," "trick," special timing, bit of special information.
1. Place piece on plate against regulating wheel	"Knack"—don't catch on wheel
2. Lower lever-feed	Hold at end of stroke (count 1-2-3-4.) Slow feed-where might taper Watch-no oval grinding
3. Raise lever-release	
4. Gauge pieces periodically	More often as approach toleran
5. Readjust regulating wheel as required	Watch-no back lash
6. Repeat above until finished	
7. Check	

A leadman in a machine shop did this break-down in 5 minutes.

This leadman uses this break-down "as is" for men who have ha previous experience on centerless grinders.

For green men he breaks up the operation into several "instructi units." He strikes off a detailed break-down for each unit.

Example 3

JOB BREAK-DOWN SHEET FOR TRAINING MAN ON NEW JOB

Bench lathe job-drill, bore,
Governor Brake Disc OPERATION: ream and face

IMPORTANT STEPS IN THE OPERATION Step: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might— Make or break the job. Injure the worker. Make the work easier to do, i. e., "knack," "trick," special timing, bit of special information.
Chuck	Chuck squarely-no chips, no nicks
Indicate	Low speed
Center drill	Angle-give drill double bearing
Drill	Lips even. Feed even. High for chip clearance. Clean drill
Reverse piece	
Bore	Feed even and slow
Plug gauge	Enough stock for reaming
Ream	Feed evenly. If bell shaped, check tool
Set cross slide	No back lash
Turn	Feed evenly. Keep "drag" for good finish
Face	Keep "drag" for finish
Gauge holo-plug gauge	Never remove piece-"feel"
Check	
Remove and place in tray	Don't drop

A job setter in a machine shop did this break-down in 9 minutes.
He uses this break-down "as is" for workers who have had other ...ch lathe experience.
For green men he uses one or two of the above steps as a separate ...structing unit, and makes a separate detail break-down for each of ...ese smaller units.
Example 3a shows his detailed break-down for "chucking."

JOB BREAK-DOWN SHEET FOR TRAINING MAN ON NEW JOB

PART: Governor Brake Disc OPERATION: Chucking for Lathe Job

IMPORTANT STEPS IN THE OPERATION Step: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might— Make or break the job. Injure the worker. Make the work easier to do, i. e., "knack," "trick," special timing, bit of special information.
1. Open jaws	Wrench full into sockets
2. Clean out chips	Use brush-not hands Get all out
3. Set piece in jaws	
4. Adjust jaws to piece	Even pressure all round-not too tight
5. Try for balance	Must center
6. Final tighten-jaws	Must hold against pull of cutting tools

Example 4

JOB BREAK-DOWN SHEET FOR TRAINING MAN ON NEW JOB

...RT: Slide Base 235310 OPERATION: Mill Dovetail

IMPORTANT STEPS IN THE OPERATION ...ep: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might— Make or break the job. Injure the worker. Make the work easier to do, i. e., "knack," "trick," special timing, bit of special information.
Select cutter	Small-minimize chatter
Select holder parallels	Narrow-yet to give good hold
Place piece in vise	Check with tissue
Rough cut	Start by hand-1"-Check for finish stock and location
Trial finish cut	Check-make correction
Finish cut	Finish without stopping
Remove from vise	
File burrs	
Check	

An experienced workman in a machine shop made this break-down in ... minutes.
This instructor uses this break-down "as is" for workers who have ...ad other milling machine experience.
For green men each of these steps might constitute an "instructing ...nit" by itself and require a separate detail break-down.
Example 4a shows the detailed break-down for Step 4, above, Rough ...t.

Example 4

JOB BREAK-DOWN SHEET FOR TRAINING MAN ON NEW JOB

PART: Slide Base 235310 OPERATION: Rough cut for Milling Dovetail

IMPORTANT STEPS IN THE OPERATION Step: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might— Make or break the job. Injure the worker. Make the work easier to do, i. e., "knack," "trick," special timing, bit of special information.
1. Run up table by hand	Slow when nearing cutters
2. Feed 1 inch by hand	
3. Stop machine and run back table	Never run table back while cutters are in use
4. Check cut	Location and finish
5. Set feed	
6. Start machine	
7. Finish cut	
8. Check	

How to Comment Constructively on Practice Instruction Demonstrations

1. BEFORE the demonstration starts:

   a. Distribute breakdown sheets.

   b. Ask members to jot down what they can "catch" of the STEPS and KEY POINTS of the operation.

      – Review as is necessary what a "key point" is; i. e., something that is the "key" to the right doing of a step. Remember, however, that every little point or precaution is not a key point.

   c. Ask them to follow their "How to Instruct" cards and note any errors and omissions.

2. Call on a member to put on his demonstration.

   a. Call for volunteer to serve as "worker."

      Note: See that each member serves as the "worker" in one demonstration. See that the "worker" does NOT know the job wherever possible.

   b. Caution "instructor" to have everything ready and in order.

   c. Ask him to state the JOB SETTING for his demonstration.

   d. Ask him for his job breakdown.

      – Explain that you just want to see if he had caught the "knack" of breaking down the job—that you will return the sheet to him.

   e. Have a supply of breakdown sheets for your own use.

      – Jot down as the instruction proceeds both important STEPS and KEY POINTS as you can catch them from the demonstration. DON'T COPY the member's breakdown. Make your own. This will provide an interesting comparison and basis for your comments.

      Make notes on the same breakdown sheets as to errors, omissions, and mistakes you have observed in the GET READY points and keep STEPS II and III notes in parallel columns, so you can compare points CHECKED against points PRESENTED. (See page 66.)

3. AFTER the demonstration, comment as follows (allow 10 minutes).

Thank the "worker" for his cooperation and let him return to his place. Ask the "instructor" to leave his demonstration job set-up and remain at the front.

a. STEP 1—PREPARE THE WORKER

To Group – Let's review this demonstration with our 4-step method.
Let's look at Step 1 on our cards.

Select for comment from the following as appropriate:

To Group – What is the first item?
(Put him at ease.)

– Was this natural, or overdone, or poorly done?
(Group's answer.)

To a Member – What is the second item?
(State the job, etc.)

– What was the job the worker had to learn?
(Member's answer.)

– How much did the worker know about it?
(Member's answer.)

To Group – The third item on the card is—"Get him interested in learning job."

To a Member – How did the instructor get the worker interested in this case?
(Member's answer.)

To Worker – What is the last item under Step 1?
(Place in correct position.)

– Were you in the best position to see the job?
(Worker's answer.)

b. STEP 2—PRESENT THE OPERATION

To Group – Let's see how the job was presented.

Select for comment from the following as appropriate:

To Group – What is the first item under Step 2?
(Tell, show, and illustrate one IMPORTANT STEP at a time.)

– How many important steps did you catch?
(Answers from several members. If a difference exists, it serves your purpose excellently. In any case, say: Suppose we hold the discussion on how each important step was presented until later.)

To Group – What is the second item?
(Stress each KEY POINT.)

– How many key points did you catch?
(Answers from several members. If a difference exists, it serves your purpose excellently. In any event, say: Let's discuss the key points later when we look at the Important Steps.)

To Worker – What is the last item under Step 2?
(Instruct clearly, completely and patiently, etc.)

– Were the instructions clear, understandable, complete or is there more information you would like to have?
(Worker's answer.)

c. STEP 3 – TRY OUT PERFORMANCE

To Group – The first item on the card under Step 3 "Try out Performance" is—"Have him do the job—correct errors."

Select for comment from the following as appropriate:

To a Member – Were any errors corrected the first time the worker performed the job?
(Member's answer.)

If appropriate, ask:
– What were they?
(Member's answer.)

To Group – What is the next item under Step 3?
(Have him explain each KEY POINT, etc.)

– Was each KEY POINT explained by the worker or did he miss some?
(Answers from several members. If a difference exists, it serves your purpose excellently. In any event say: Let's save the discussion on checking these Key Points until later.)

To Worker – What's the next item under "Try out Performance"? (Make sure he understands.)

– Do you understand all the key points of this job or are you hazy about some? (Worker's answer.)

To Group – How many times did the instructor have the worker do the job and explain the key points? (Group's answer.)

To Instructor – What is the last item in this step? (Continue until YOU know HE knows.)

– Why were you satisfied the worker knew the job in this case? (Worker did the job and explained it again and again until he knew it perfectly.)

d. STEP 4—FOLLOW UP

To Group – Let's look at Step 4 of our method. What is it? (Follow up.)

Select for comment from the following as appropriate:

To a Member – What's the first item? (Put him on his own. Designate to whom he goes for help.)

– To whom does the worker go in this case? (Member's answer.)

To Instructor – The next items on the card are: Check frequently. Encourage questions.

– How soon will you have to check? (Instructor's answer.)

– The last item in Step 4 is "Taper off extra coaching and close follow-up."

– How would you taper off your follow-up during the next several hours—several days? (Instructor's answer.)

e. REVIEW THE USE OF JOB BREAKDOWN IN STEPS 2 and 3

To Group – Let's review how the Job Breakdown was used in this case.

– Our card tells us under Step 2 "Present the operation to STRESS each KEY POINT."

– And under Step 3 "Try out Performance to have him EXPLAIN each KEY POINT."

– In order to find out if each key point was properly handled, let's slow down the job, and look at each important step one at a time.

To a Member – As I caught the instruction the first Important Step was—

– What key points did the instructor stress in that important step?
(Member's answer.)

– What key points did the worker explain when he performed that important step?
(Member's answer.)

Note to Trainer: Continue the above questioning on each important step using different members. "Smoke out" key points you feel should have been brought out using the "What would happen if—, Why did you—, etc." technique with the instructor and worker. Where key points were brought out in Step 3, for the first time, or not checked in Step 3, or missed in both Steps 2 and 3, always make a convincing statement about the importance of properly handling key points.

To Group – The last item on the card reminds us "If worker hasn't learned, the instructor hasn't taught."

– Let's turn our cards over to the other side.

f. THE GET READY POINTS

Select as appropriate from the following:

To Instructor – What is the first Get Ready Point?
(Have a Time Table.)

– How does this job fit into your training plans?
(Instructor's answer.)

– What are you going to give him next?
(Instructor's answer.)

– Why are you going to give him that particular operation?
(Instructor's answer.)

– When are you going to train him by it?
(Instructor's answer.)

To Group – The next Get Ready point on the card is "Break down the job."
– We have just reviewed the breakdown for this job.

To Instructor – Were there any points brought out in our discussion of the breakdown that would make the job easier for you to put over if you had to instruct the worker again?
(Instructor's answer.)

– What, for instance?
(Instructor's answer.)

To Worker – Did our discussion help clear up any points for you?
(Worker's answer.)

– Will you illustrate?
(Worker's answer.)

To a Member – What is the third Get Ready point?
(Have everything ready.)

– Were there any fumbles—did the instructor forget anything?
(Member's answer.)

To a Member – What's the last Get Ready point?
(Have the work place properly arranged.)

– Did the instructor have to change the work place during the instruction or apologize?
(Member's answer.)

To Group – What effect will this kind of instruction have on production, quality, safety, and on personnel problems?
(Answers and reasons from several members.)

To Instructor – Will this 4-step method help you in training your work force?

- Thank instructor for bringing in the job and remind him that the comments and suggestions were not intended to be personal. They were directed at the job for the purpose of bringing out the "fine points" and "knacks" in job instruction.

Suggestions Regarding The Standard Procedure

The first demonstrations in Session III will have many flaws. The trainer will have to pick out a few of the more basic ones and drive home his constructive suggestions concerning them. If he tries to correct every little detail in these early demonstrations, the time table for the session will be affected adversely but, what's more important, neither the instructor nor the group will be able to retain all the ideas discussed. Don't try to make the first demonstrations letter perfect. Select a few of the basic faults in each of the early demonstrations and really correct them. It may even mean that the trainer will have to leave out discussing some of the items in the standard procedure in order to drive home the points selected. The trainer should be more and more exacting in a friendly way as the demonstrations progress, correcting the minor details as the members show that they have mastered the basic ideas. It is not until the demonstrations in Session V that he does not let any fault go by unnoticed. If the trainer has done a good job of driving home his suggestions a few at a time in the early demonstrations, there will be few points needing correction in Session V.

The following are some devices that trainers have found helpful in making the discussions interesting as well as being effective in driving home points.

1. Ask the worker about points that were not made clear by the instructor. This provides a nice lead in to "If the worker hasn't learned, the instructor hasn't taught."

2. If the group has difficulty noting the Important Steps and Key Points as a demonstration is put on, remind them when a job is presented one Important Step at a time with the key points <u>really stressed</u> it permits everyone to catch these details.

3. Frequently when discussing the handling of a key point that the worker forgot, the instructor will say that he "told" the worker about it. This provides a good opportunity for the trainer to drive home the need for <u>stressing</u> key points and not merely <u>mentioning</u> them.

4. Where the instructor has not been too exacting in getting back an explanation of the key points in a job, the trainer might refer to the card and ask the instructor how he can be sure that the worker

understands. This will give the trainer a chance to sell the idea that workers should be able not only to do the job but understand "what they are doing and why."

As you gain experience in using the standard procedure you may wish to vary the actual words used from those given. This makes for interesting sessions and less stereotyped procedure. You may also find it desirable to vary the actual pattern used from demonstration to demonstration. For instance, where the standard procedure calls for asking a member what the next item on the card is, you might read the item and then ask the member the appropriate question about it. In any event, do not change the intent or strategy of the standard procedure. To be on the safe side, if there is any doubt in your mind about a variation in the standard procedure, follow the exact pattern given.

In using the standard procedure, where the member's or group's answer does not agree with what you have recorded on your "trainer's notes," guide a brief discussion to the correct conclusion. Always be constructive in your comments. We are not testing the instructor to see if he did or did not follow the 4-Step Method. We are trying to help him and the rest of the group to use the Method properly.

Johnson 11:21 11:37

JOB BREAKDOWN SHEET FOR TRAINING MAN ON NEW JOB

PART (?) OPERATION Connect wires

IMPORTANT STEPS IN THE OPERATION Step: A logical segment of the operation when something happens to ADVANCE the work	KEY POINTS Key point: Anything in a step that might Make or break the job Injure the worker Make the work easier to do, i. e., "knack," "trick," special timing, bit of special information
Bench not orderly. Wrong size screwdriver.	
I. Ease overdone Known O.K.	Interest tie-up Position no poor angle.
II	III
1. Cap on wire (how much?) (cut wire?)	always on first shin ½" don't cut wires (not clear)
2. Thin wires (handle knife?)	lay flat on bench
3. Twist (Which way?)	?
4. Tie knot (Where?) (loop?)	? (held differently?)
5. Connect wires. tight??? coded wire no frayed ends	no frayed ends O.K. just tight???
6. Put on shell. all around. down	down all around O.K.
IV.	
See me. O.K. (Who else??) got to see the supt. etc etc. What's this to the man? Take your time?? Finally gave name - key socket.	

Three Special Instruction Problems

1. THE LONG OPERATION

- How to use the 4-step method on a working operation that takes perhaps 3 hours or 3 days.

  - This is where correct instruction is MOST important. This is a situation where the learner and the instructor become most "confused" and "lost."

  - The answer is to "break up" the long operation into small "doses," then put over one dose at a time.

a. Examples in the meeting room.

  - Frequently jobs selected are: How to read the Micrometer; or Slide rule; or Vernier. When selected they should be so handled by the Trainer to illustrate the need for small unit breakdowns. These jobs should be put over by small units.

    - Example—Micrometer

      one unit—with Steps I, II, and III; parts and care of the instrument.

      one unit—with Steps II and III; the scales and their relation to each other.

      one unit—with Steps II and III; making simple measurements.

      one unit—with Steps II, III, and IV; difficult measurements, i. e., those requiring reading in fractions of thousandths.

b. Examples on the job.

(1) Installing bulkhead in ship.

This job requires about 2 hours, and must be completed without interruption because of the gantry cranes that are tied up. There is no opportunity to stop and instruct a man in each unit separately. Yet there are about six highly important and reasonably technical units in the job that must be mastered with great accuracy.

- The answer is for the gang boss not to try to explain the whole installation.

For example:

- One unit--while one bulkhead is being installed instruct only on how to compensate for the declivity. Declivity happens to be the term used to describe the slope of the ship on the ways from which perpendiculars are established. He can put the worker through the 4 steps on this unit in a few minutes, without holding up the installation.

- One unit—while the next bulkhead is being installed put the worker through the 4 steps on mould line and loft line.

- Further units—as each additional bulkhead is installed put the man through the 4 steps on one segment of the installation. After six bulkheads are installed the worker will know the job thoroughly

  - much better than if he had been forced to try to master the whole job as best he could. He might have to struggle through the installation of some 30 bulkheads before he would finally catch all the points.

(2) Long assembly operation:

Sub and final airplane assembly jobs require several hours. Sufficient time is available on such jobs for the instructor (leadman, experienced worker, or whoever he may be) to put the learner through the 4 steps on EACH of the individual operations as the work proceeds. The whole point is to instruct men in SMALL UNITS of the work.

(3) Long machining operation:

The machining of large castings for tank, diesel engines, and ship use often takes several hours up to a few days. To instruct correctly, there should be perhaps 5 units of instruction--

- two units—in getting the work into the machine

  one unit —on centering the work

  one unit —on setting the cutters

  one unit —starting the machine

Time does not permit this procedure, so another plan must be used.

In this case the instructor has no choice but to take his man through all the steps necessary to get the job started, explaining each move, of course. Such a Step II is much too long for normal good instruction. There may be 40 or 50 important points in the operation. But in this case, there is no choice.

After the job is going, however, there are several hours of time available, which the instructor can use for Step III. Of course, he can't take the work out of the machine and have the worker DO the job, as should be done in the normal performance tryout, but he can check him thoroughly on each operation step and key point verbally. The instructor can have the man explain to him the operation and the key points again and again with the result that the worker has every minute detail of the operation clear in his mind.

When the next job is to be machined there won't be many points the worker doesn't know. All he will need is some practice in physical handling.

Naturally Step IV will be used in the normal way.

2. THE NOISY SHOP

- How to use the 4 steps in a shop where the noise is so great that one can't hear.

a. This is a common problem in boiler shops, chipping rooms, and departments where there is noisy machinery. There are two natural things to do:

(1) SHOW with exceeding care.

- This is the only method that can be used, so it must be done SO WELL that it carries the whole instructing job. Again small units must be presented.

(2) Go to a quiet place.

- Before and after showing, the worker can be taken to a less noisy place to discuss the operation and check his knowledge.

3. PUTTING OVER "FEEL"

- How to instruct a man in that important (often mysterious) thing called "feel."

Dispel at once the idea that "feel" is mysterious or difficult to put over to another. It is SIMPLE and can be done EASILY. However, it requires practice to become reliable in use.

Example: Micrometer reading.

- The instructor places the instrument on the shaft and tightens it until the "feel" is right. He then passes the "mike" to the worker and has him put the "mike" on the shaft and note the "feel" of the tightness.

  He then has the worker "back off" the "mike" and tighten it to the same "feel" set by the instructor. By passing the instrument back and forth in this manner a few times, the worker quickly learns the "feel."

  This same point may readily be demonstrated in the meeting room with a vise, nut and bolt, small ball bearing race, and a number of similar pieces of equipment. As a last resort, the "feel" of correct tightness of a fountain pen cap can be used.

Usefulness of the Four "Tools" of Instruction

Sometimes in one of the sessions there may be a little time available. If so, here are some good points to add.

1. TELLING

   Telling alone is not very useful as an instructional tool when the objective of the instruction is to develop new manual skills. It may be used to advantage when the objective is to impart information, if the information can be interpreted easily by the worker in terms of his past knowledge and experience. When the "telling" tool is used in instruction, it is particularly important that the instructor follow the "telling" by checking the learner's understanding of what was told.

   "Telling" has some value when it is used sparingly in combination with other instructional tools such as "showing" and "asking" or when a limited amount of new information must be passed on to the worker.

2. SHOWING

   "Showing" alone is better than "telling" alone as an instructional tool when new skills are to be developed, but it is of greatest value when it is used in combination with the "telling" or "asking" tools.

   a. "Showing" is particularly useful in the presentation step of a job when the worker is being taught to do something which he could not do before.

b. "Showing" where the actual tools and equipment which the worker will use "on the job" is most desirable.

3. ILLUSTRATING

This is really another method of showing. For purposes of instruction, "illustrating" means charts, diagrams, blueprints, sketches. Many a worker has had a point made clear to him by a sketch scratched on a cement floor, piece of boiler plate, or side of a casting. "Illustrating" is a most valuable tool that is used countless thousands of times every minute throughout the shops of the Nation.

- If a sketch or blueprint is used, be sure the worker understands it.

- Do not leave too much to the worker's imagination.

- Make sure the worker is able to translate your illustration into the actual conditions.

4. QUESTIONING or ASKING

"Asking" is an instructing tool which is useful throughout the entire instructional process if it is used properly.

- It can be used in preparing the worker for instruction.

- It can be used in checking the worker's grasp of the instruction.

- It can be used in helping the worker to think through the logical steps of his new job, which is the most important thing in good instruction.

- It can be used in combination with the other instructional tools such as "telling" and "showing."

- It is PARTICULARLY IMPORTANT that the questions which are asked are framed so that a "yes" or "no" answer cannot be given. Questions which begin with such words as "What," "Who," "When," "Where," "How," and "Why," cannot be answered in this fashion.

  - Well-selected questions keep the worker's mind active and concentrated on what is being taught.

  - Heightens worker's interest.

  - Stimulates his confidence by affording him an opportunity to show his own knowledge.

  - Gets active response from him and helps to make the points "stick." This is very important to the instructor.

Typical Problems That May Arise

Concerning Job Instruction Training

BE SURE YOU UNDERSTAND the problems noted below and their possible solutions. If you have ANY DOUBT or any further questions get in touch with the District Training Within Industry office. A thorough understanding of these problems and their solutions will enable you to meet practically any problems raised in your meeting.

1. How does this basic training idea differ from the training that every shop supervisor has done for years?

   - Most shop training has been by "accident" and by "good luck." Men have been placed on jobs and ALLOWED (often DARED!) TO LEARN. Gradually the men have learned, of course. But it is usually an expensive process. There is much scrap, many accidents, many delays.

   - This plan is founded on fundamentals:

     (1) Men are INSTRUCTED in their work.

     (2) They are given the job in SMALL DOSES, each learned PERFECTLY. This plan permits of no errors from the start. "DO IT RIGHT THE FIRST TIME" is the basic idea.

2. We foremen don't do any instructing in our shop. We turn the inexperienced fellow over to an "old hand." How could we use this plan?

   - Give the "old hands" this 10-hour program. Otherwise what assurance have we that these workers know how to instruct?

   or

   Perhaps full-time job instructors should be appointed to help carry the load for a limited period.

   or

   Perhaps the supervisors are taking the line of least resistance. Perhaps the supervisors SHOULD do more of the breaking in.

3. If we train experienced workers how to instruct they will want an extra dime or quarter an hour. What are we to do with that?

   - The specific answer to this question is beyond the province of this program. It deals with a local company practice and should be faced as it exists and solved as best fits the local situation. Perhaps the men should receive extra pay when "breaking in" other men, perhaps not.

4. What's a supervisor going to do when 10 to 20 new men show up for work at the same time?

   - The question of rate of induction is beyond the province of this program. It deals with a local company practice.

     - Here are three possible attacks, however:

       (1) Train a corps of assistants—perhaps workmen—who can help handle such a group during the first few days. Such men might really be "temporary" job instructors. Incidentally, this is a good way to line up some new "lead men."

       (2) Talk to the boss and the employment manager. Maybe they will agree that there is no production gained by sending too many men at a time.

       (3) Just "stagger through" as best you can. Put the men temporarily doing simple jobs where no damage will result, until you can instruct them one by one. For example: Sweeping up, carrying stock, cleaning parts, counting pieces, sorting papers, learning part names, checking supplies, etc., etc. Avoid having them stand around and "look on" if possible.

5. How can a long operation on a machine be broken up into small instruction units when the whole job must be run through without stopping?

   - Have the man do one part of the job; the instructor does the rest. Soon the man can be given the second part of the job, with the instructor doing the balance of it. In this way the worker can be taught the whole job in SMALL DOSES and still do each part PERFECTLY the first time and every time thereafter.

     - See pages 67 to 69 also for pointers on this problem.

6. Is it necessary to go through a complete Step I every time a worker is instructed?

   – Where there are several "instruction units" in ONE operation, naturally only one complete Step I is required. Such situations occur frequently. The instructor might spend a half hour or more with a worker, yet put over several instruction units. It would be most unnatural to start each new unit with a complete Step I.

   Example: Part – simple steel collar

   Operation – turning out the collar (originally cut to rough dimensions).

   The practical way to "put over" this job using the four steps is as follows:

Steps I, II and III.	Put in machine and true up.
Steps II and III.	Drill and ream.
Steps II and III.	Face one side and chamfer.
Steps II and III.	Set up for outside turning.
Steps II and III.	Turn outside – rough and finish.
Steps II and III.	Face and chamfer other side.
Step IV.	(Covering entire operation.)

7. Our shop is manned by all-round mechanics only. We train through a 4-year apprenticeship plan, so naturally this job training idea doesn't apply in this case.

   – On the contrary the job training plan advocated in this 10-hour program applies EXACTLY the same way in developing all-round mechanics as when developing production operators. An apprentice can learn a lot EASIER and faster and make fewer mistakes and delays if he too is instructed in SMALL DOSES and trained to do each perfectly. This means, of course, that first-line supervisors and many of the mechanics themselves must be given this 10 hours of training so they will know how to instruct apprentices in this thorough-going manner.

8. Is this a speed-up system?

   – Job Instruction undoubtedly increases production and often enables employees to reach their maximum output at an early date. Such results, however, are simply the by-products of intelligent and sympathetic handling on the job. If employees do turn out more production as a result of this program they do so "under their own steam" and because they learn easily and quickly. This plan simply gives each employee an opportunity to release his best efforts to the job.

9. Our plant is beating its production schedule now. We have never had to go through all this trouble to train men. Don't results speak for themselves?

- Yes, of course. Fortunately, workmen can learn by themselves. In fact, this is the way that most industries have developed their work forces. This job training plan implies no criticism of the production job now being done. It simply proposes that any plant can do a BETTER JOB when workmen are "instructed" rather than just "allowed to learn."

10. How about some "orientation training" in Step I, i. e., telling a man something about the Company, his pay, hours of work, etc., etc.

- Proper orientation of employees is just as important as proper job instruction; however, this program deals solely with Job Instruction. At the time an employee is concentrating his attention on how to learn his new work, no extraneous thoughts or information should be given him. This applies in all Four Steps.

  For example, if an employee should ask how many pieces he is to make, or what his rate is to be, or where he can park his car, or any other subject not related to learning the job, the supervisor should take care of these points at a more suitable time. His typical and tactful reply to a worker might be "we will talk about that matter just a little later — right now let's get the job under our belt."

11. Doesn't this plan take too much time? Everyone is already so busy that extra time is not available.

- All training takes some time. Every minute should be effective. The Four Step method, plus the making of job breakdowns, does seem to take a little extra time. Actually it saves time. It probably doesn't consume more than perhaps three to eight or ten minutes each time instruction is given. Supervisors must remember that the giving of this three to ten minutes can save days and weeks of time later on, and large amounts of scrap and a large number of accidents. In literally thousands of cases the time required for employees to get up to production has been reduced as much as one-half, and scrap losses have been reduced up to sixty or seventy percent by giving those few minutes of additional time to initial instruction!

SUGGESTED INTRODUCTION

OF JOB INSTRUCTION TRAINER BY EXECUTIVE

* * * * *

Job Instruction is:

- a streamlined method of instruction
- sponsored by Company and Training Within Industry

This program is important:

- it will help you get the "know how" over, quicker and easier
- it applies to both new and experienced workers

The management:

- has approved this program
- is interested in the results obtained through its use
- has arranged for your attendance at each meeting

There will be:

- 5 two-hour sessions

  held at _____ in _____ room, on _____

This is Mr. _____ from _____ who will conduct the sessions.

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