ABSTRACT
        Part of a series of instructor training modules on
related subjects instruction for apprentices, this booklet deals with
directing learning activities for instruction. The first chapter
consists of an outline of the scope and content of the instructor
training modules as well as a self-assessment pretest. Covered in the
module are establishing a positive learning atmosphere of interest,
enthusiasm, respect, and positive interaction; motivating apprentices
to learn; reinforcing learning and attitudes; ordering lessons and
activities so that each builds on previous lessons; and organizing a
class for smooth transitions across time, materials, content, and
activities. Appended to the booklet are answers to the self-test
exercises, a posttest, and answers to the posttest. (MN)

DIRECTING LEARNING ACTIVITIES FOR INSTRUCTION

Instructor Training Module #6

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GLOSSARY

The words on this list are used in this booklet. Please review the terms and learn the definitions The meanings of the words as used in the text may not be the form of the word with which you are familiar.

Words/Terms

1. *Abstract* — To summarize.
2. *Ambiguous* — Unclear.
3. *Analogy* — Resemblance in certain aspects.
4. *Convergent* — To focus attention increasingly on a single idea or answer believed to be correct/useful.
5. *Criterion-based instruction and evaluation* — A system of teaching and evaluation in which the evaluation questions are linked directly to the content. The degree of success apprentices earn during evaluation is determined by comparing apprentice responses to the test questions to some pre-determined standard of success
6. *Differentiate* — To distinguish items from each other.
7. *Divergent* — To encourage attention to a variety of items or answers, any or all of which might be correct/useful.
8. *Hypothesis* — A tentative, possible answer. Usually several possible answers are considered before the best answer is selected.
9. *Interrogative* — To question in a way that requires explanation and elaboration.
10. *Model of sequencing* — A single, systematic way of ordering information that is distinct from other models.
11. *Redundancy* — Repeating the same message.
12. *Reinforcement* — Information that strengthens a behavior.
13. *Sequencing* — Arranging in order a set of materials or information.
14. *Tedious* — Tiresome and difficult.

1. How To Use This Booklet

What Is The Series About?

Related subjects instruction is an essential part of every apprenticeship program. It is the program component through which apprentices are taught the background theory and range of application of associated technical subjects such as mathematics, science and safety. Related instruction usually takes place in a classroom, after the regular work is over. Most frequently, related instruction is taught by a skilled tradesperson or craftworker. For the tradesperson or craftworker to be an effective trainer, he or she must not only know their trade skills, but also they must use teaching skills appropriate for conveying that information to apprentices. This series of materials is written to train related subjects instructors in the critical teaching skills necessary to perform their jobs effectively. The titles of the booklets in the series are:

1. *Introduction to Related Subjects Instruction and In-Service Training Materials*
2. *Planning the Apprenticeship Program*
3. *Planning Related Subjects Instruction*
4. *Developing Instructional Materials for Apprentices*
5. *Presenting Information to Apprentices*
6. *Directing Learning Activities for Instruction*
7. Providing for Individual Learner Needs
8. *Controlling Instructional Settings*
9. *Evaluating Apprentice Performance*
10. *Communicating with Apprentices*

The first booklet introduces the series, describes the content of each booklet, and provides an overview of apprenticeship and of adult learners. The second booklet describes how to plan an apprenticeship program and may be used by related instructors, sponsors or service agencies. Each of the other eight booklets deals with a set of training skills judged by a panel of experts on apprenticeship to be critical to working effectively as a related subjects instructor.

What Is This Booklet About?

The materials in this booklet are about managing and directing learning activities in the related subjects instructional setting. The skills are associated with the dynamics of learning and are closely related to the presentation of information.

The skills are based upon the premise that the best learning occurs when trainees are actively involved in processing and applying the information and skills you will be teaching. Directing learning activities involves creating a positive learning environment. This is a setting that can be characterized as one in which:

a. apprentices work in productive routines without distractions;
b. trainees and instructor share a thorough understanding of requirements and learning schedules;
c. trainees and instructors enthusiastically undertake the learning activity; and
d. all activities ultimately focus on the work competency of the trainee.

Establishing and maintaining a positive learning environment means that in addition to your other teaching responsibilities you also must function as a classroom manager, setting the stage for learning, stimulating interest-directing activity, and demonstrating applications of necessary knowledge. The skills that you will need in order to carry out this duty effectively are the contents of this booklet. These are:

1. Establish positive learning atmosphere of interest, enthusiasm, respect, and positive interaction;
2. Reinforce apprentice learning and attitudes;
3. Motivate apprentices to learn;
4. Order lessons and activities so each builds on previous lessons; and
5. Organize class for smooth transition across time, materials, content and activities.

What Must I Do To Complete My Work In This Booklet?

Working your way through this booklet will require you to read the text, to answer the questions, to perform the exercises, and to complete the pre- and post-assessment instruments. Expect to spend about five hours working through the materials. The only resources you need to complete your work in this booklet are: (1) a copy of the booklet; (2) a pencil or pen; (3) about two hours of time; and (4) recollection of past related instruction experiences.

The materials are written in a self-instructional, programmed format. You may work through the text, examples and questions at your own pace and leisure; you need not complete your work in the booklet at one sitting.

Each chapter in the booklet is devoted to a single skill. The general format of the chapters is similar, with the following parts:

1. An *introduction* describing the skill and the instructional objectives for that skill.
2. *What* is, *when* and *why* to use the skill.
3. Step-by-step *directions* for how to perform the skill.
4. An *example* of how the skill is used in related instruction.
5. A *self-test exercise* to apply the information about the skill.

How Much Do I Know About the Subject Before I Begin?

The self-assessment will assist you to focus on competency areas associated with directing learning activities for adult learners. Read each competency statement listed in Figure 1 and assess your level of skill in performing that task. Knowledge means what you know about the subject while skill means your experience in successfully performing the task. Circle the number that best describes your level of knowledge and skill. Competencies where your ratings are poor or fair are those on which you should concentrate. Pay particular attention to the chapters which deal with those competencies.

Figure 1:

Chapters	Competencies	Rating			
		Poor	Fair	Good	Excellent
2. Establish positive learning atmosphere of interest, enthusiasm, respect and positive interaction	1. Construct and use examples	1	2	3	4
		1	2	3	4
	2. Construct and use practice situations	1	2	3	4
		1	2	3	4
	3. Develop/use good questions	1	2	3	4
		1	2	3	4
	4. Encourage trainee enthusiasm	1	2	3	4
		1	2	3	4
	5. Deal with factors related indirectly to learning in the instructional setting	1	2	3	4
		1	2	3	4
3. Motivate apprentices to learn	6. Identify factors effective for motivating apprentices to learn	1	2	3	4
		1	2	3	4
	7. Apply appropriate motivational techniques to learning environment	1	2	3	4
		1	2	3	4
4. Reinforce apprentice learning and attitudes	8. Use principles of reinforcement in providing feedback and rewards to apprentices	1	2	3	4
		1	2	3	4
	9. Select and apply appropriate reinforcement strategies in the learning environment	1	2	3	4
		1	2	3	4
5. Order lessons and activities so each builds on previous lessons	10. Choose among alternative ways to order content, based upon characteristics of content	1	2	3	4
		1	2	3	4
	11. Sequence materials according to a specific model	1	2	3	4
		1	2	3	4
6. Organize class for smooth transition across time, materials, content and activities	12. Use strategies that insure smooth transitions across topics and lessons	1	2	3	4
		1	2	3	4
	13. Use daily schedules	1	2	3	4
		1	2	3	4
	14. Provide clear instructions	1	2	3	4
		1	2	3	4

2. Skill: Establish Positive Learning Atmosphere Of Interest, Enthusiasm, Respect And Positive Interaction

Introduction And Objectives

As the instructor in the related subjects program, it is your responsibility to create an atmosphere that contributes to effective learning. In such an environment apprentices display interest and enthusiasm. Interaction between instructor and trainee is positive. Each treats the other with mutual respect.

You can produce this type of environment through careful use of procedures including questions, examples and the general patterns of interaction. Each of these three instructional devices, questioning, examples, and general interaction, follows a slightly different set of guidelines. After you work your way through these materials, you will demonstrate your competence by being able to

1. Suggest the ways to use both examples and practice in the instructional setting;
2. Develop and use questions in the instructional setting;
3. Critique questions to point out potential problems; and
4. Indicate ways to develop and maintain positive interaction.

What Is, Why And When To Use The Skill

A positive learning atmosphere is something that you should begin to work on before the first instructional period and continue to work on throughout the entire related subjects instructional period. It results from your management of instructional activities and can be engineered best through your behavior with regard to posing questions, providing examples and practice, and manipulating factors like interaction in the instructional setting. It sets the stage for effective learning; in its absence, learning is much more difficult and less efficient. In a positive atmosphere, learners and instructors can concentrate on the information under consideration rather than be concerned with distracting side issues and petty concerns.

Each of the three major procedures within the scope of establishing a positive learning atmosphere is discussed in the following pages. Suggestions, directions and examples are provided to demonstrate how to use — and not use — each technique. The example and self-test exercises of the end of the unit cover all three topics.

Provide For Examples, Illustrations, And Practice*

One of the most critical things you must do as a related subjects instructor is to provide illustrations, examples and practice for apprentices. Such activity facilitates learning of skills and knowledge and aids the learner to apply the skills and knowledge to new situations in the work place. Examples and illustrations provide apprentices with a second way to view the information under consideration. This second view, especially one that displays the information visually, is particularly critical because of the variety of ways that adults process information. Further, as you will recall from prior learning, adults usually understand combinations of visual and verbal information more easily than written or auditory types of information.

Practice offers apprentices an opportunity to learn thoroughly the knowledge and skills. It provides situations where information must be transferred to new settings and manipulated in order to solve problems and answer questions. New insights are gained while using the skills or knowledge. Equally important, by using a skill or knowledge, apprentices gain confidence in their own abilities and skills. Once the skill or knowledge is used successfully, the apprentice develops an ownership of the materials and the particular process for using the information.

Examples and illustrations

Examples and illustrations are ways of relating the subject matter to the life/work experiences of apprentices. They are drawn from the workplace. Their worth is judged by the degree to which they render real, practical and useful the information under consideration. They aid understanding because they are concrete instances of the topic of concern.

Examples and illustrations take a variety of forms including visual, auditory, tactile, models, demonstrations, films/video-tapes, charts, graphs, pictures and so forth. The general steps in preparing and using examples and illustrations are:

1. Consider the information you are teaching and the trades of the apprentices in your charge. Select from the work setting of each of the major trades rep-

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* Please refer to Module #4, *Developing Instructional Materials For Apprentices* for more complete information on providing examples, illustrations and practice.

resented in your class, an example that dramatizes the major points in the lesson. If possible, especially if there are relatively few trades represented among the apprentices in your charge, select two or three examples for each major point.

2. As you select examples, order them according to level of difficulty. (See Chapter 5 in this booklet for a discussion about different ways of ordering materials.) The two most useful strategies for sequencing examples are concrete-to-abstract and simple-to-complex. By arranging examples according to the level of difficulty and concreteness you help apprentices to master more comprehensive and complex amounts of information about knowledge and skills under consideration.

3. Prepare the examples in advance of the lesson during which they will be used. If a handout, overhead, visual or model will be used as part of the example, be sure that it is ready In addition, decide at what point in the lesson you will use each example *and* how you will introduce it.

4. Use the set of examples in the lesson Be certain to introduce, display, discuss and relate each example you present to the lesson. If you use multiple examples, point out similarities and differences among them. Lastly, as you summarize the lesson, include a summary of the points emphasized through examples. Remember, the odds are good that the apprentices first will recall the examples you have presented; from the examples, they then will deduce and remember the major points of technical information under consideration.

Practice

Practice or application of the knowledges and skills being learned should become a standard portion of every lesson you teach. It can begin with something as simple as a review of the major points, during which you ask questions to see if the apprentices have learned each major point. Such a review is most effective when you ask apprentices to demonstrate their understanding of the principles, concepts and skills by citing specific applications from their own trade or craft. When apprentices can offer appropriate examples you can be confident that they can identify and define at least the major points of the lesson. Adequate practice opportunities, however, go considerably beyond identification and definition. They also provide real or simulated opportunities to apply the knowledge and skills to new situations.

Often the most efficient and effective way to set up a practice situation is through use of problems and problem solving. Problems are drawn from example applications in the workplace. Frequently you can ask apprentices to bring in examples that illustrate major points or applications from their work and adapt these examples to use as problems.

The general procedure for using problem solving in

this capacity requires that the apprentice undertake four steps: (a) identify and diagnose the problem and its component parts; (b) consider possible strategies for solving the problem; (c) select a strategy to use and secure the information, equipment, parts, tools and so forth needed to use the selected strategy; and (d) solve and check the problem. You as the instructor have an opportunity to check apprentice understanding of the information under consideration in each of the four steps because by using problem-solving you observe trainee understanding of processes or procedures as well as the final outcome or product. Your steps and responsibilities in providing for problem-solving type practice are:

1. Formulate the problem, usually based on examples from the workplace often supplied by apprentices. Provide enough specific information so that the trainee can identify and diagnose the problem from given information. Be sure that the problem uses the major points under consideration and can be diagnosed without knowing other information, however, this does not mean that the identification or diagnosis is obvious. Make certain that trainees understand what is expected of them in terms of final resolution of the problem. Also, be sure that you have prepared all necessary information, handouts, displays, data and so forth that are needed to diagnose and solve the problem.

2. Present and explain the problem. Emphasize what the expected performance will be as well as the time frame in which apprentice activity is to occur. Further, if there are any special conditions, note them before activity begins. It also is useful to discuss the timing and requirements of evaluation before activity begins.

3. Check the procedures and products that are used by apprentices in the problem-solving exercise. Note incorrect or inaccurate use of skills and knowledges for later discussion. Note and reinforce use of appropriate procedures and equipment.

4. At the conclusion of the exercise discuss the problem, apprentice findings, solutions and procedures, together with the most appropriate ones with trainees. Note difficulties that you observed during the exercise, as well as strengths you noticed. If necessary, reteach or review the information with which there was a problem.

Posing Questions

Asking questions is perhaps the most often used instructional technique. Studies estimate that as much as three quarters of all actual instructional time is spent in asking and answering questions. Questions are tools that can be used for a dozen purposes in the instructional setting including:

a. motivate and stimulate lesson interest,
b. encourage and require active participation,
c. stimulate learners to associate and transfer information;
d. evaluate progress and learning;
e. stimulate and direct learners to seek out additional information;
f. shape learner performance and behavior,
g. give directions and ensure that instructions are understood;
h. review and summarize information,
i. diagnose individual learner needs;
j. correct misbehavior and disruption;
k. build self-concept and confidence, and
l. focus emphasis and attention of the learner.

The primary reason for asking questions is to cause learners to think. There is a direct relationship between the type of question asked by you as an instructor and the type of learning and thinking that a trainee uses in considering and answering the question. For example, if you pose questions that ask only for facts, then learners will respond only with facts and will use only facts in thinking about the question. However, if you ask questions that require the learner to apply, transfer and process information, the apprentice will transfer facts and concepts to new situations as he or she works to answer the questions.

Good questions require the trainee to process and apply a variety of information in order to respond. These questions are judged by their clarity and their ability to stimulate different kinds of thought. They facilitate achievement of the instructional performance objectives — knowledge, skill and attitude objectives. Clear questions leave no doubt about the purpose of the question. Further, because they must be written in understandable language, questions reference familiar knowledge and skills and require the respondent to apply the information in some new way or to a different situation.

Questions are of different types and may be classified according to the type of information processing re-

quired to answer the question. For example, some questions require nothing more than simply recalling factual data for a specific situation. Such questions are called convergent or memory questions. An example of a memory question is "What tool is this?" Unfortunately this type of question makes up the majority of questions asked by teachers. Too often this type of question does not require the learner to apply the knowledge or skills that have been learned. Figure 2 illustrates several common types of questions. A good lesson will include questions from each listed category.

The most critical part of questioning is formulating and phrasing the question. You can simplify your questioning responsibilities if you follow the logical steps presented in the following discussion.

Step 1: Consider Possible Areas of Questions

First, make preliminary decisions about what you want to do in asking questions. Consider. (a) What purposes do you want to achieve with the use of questions?, (b) What are the performance objectives and content you want to address during instruction with questions?, (c) What types of questions do you want to use, given the content? As you consider each item, you will determine the underlying focus and strategies of your teaching. Remember, a good question stimulates thought, serves as a model, and leads to excellent learning.

Some instructors find that constructing and using a chart like that displayed in Figure 3 assists them in employing questions in class. In most instances, you will find that after about three times of spending the thirty extra minutes of preparation time per class session to construct the chart, you can reduce dramatically the time required in preparation. Eventually you will need to make only a couple of notes about questions you will ask rather than writing out the entire chart.

You will be able to fill in other parts of the chart as you work your way through Steps 2 and 3 of these materials.

Figure 2: Types of Questions

Name of Type of Question	Type of Thinking	Example
Convergent/Memory	Single acceptable answers, usually facts	What tool is this?
Divergent	Variety of acceptable answers, require processing and application of information	What do you suppose the outcome of changing building codes on framing would be?
Evaluative/Problem-Solving	Consider information and draw conclusion or apply to specific situation to solve a problem	Why would one use an arc weld rather than an acetylene weld in that situation?

Figure 3: Question Chart

Content and Objectives Addressed by Questions	Purpose	Types of Questions	Questions To Use	Strategies For Use
1.				
2.				
3.				
4.				

Step 2. Phrase Sample Questions

Once you have decided on the purposes and kinds of questions you would like to ask, spend time writing out sample questions. Work on the phrasing you will use in class When properly written, a good question will be clear. It will:

1. use vocabulary appropriate to the respondent group,
2. indicate what type of thinking or behavior will be required by respondents;
3. contain content about the purpose of the question, and
4. be correct grammatically.

A good question will leave no doubt about what is being asked, even by those who neither know the answer nor know exactly how to find the answer You should actually write out several sample questions related to each content or performance objective. Doing this will help you to formulate and use questions during the lesson. Not only will you have a set of prepared questions to use, you also will have a pattern of question type and format that will aid you to generate good questions while presenting the lesson.

After writing out your sample questions, check each question against the list of guidelines for phrasing listed below. Correct any limitations or problems that you see in the questions you have written. Be especially careful to avoid using ambiguous questions. Remember, if you want questions to stimulate thought and to help apprentices apply knowledge and skills to new, job-related situations, you must be absolutely clear in the questions you use as tools. The guidelines for question phrasing are:

1. Word questions clearly so as to avoid ambiguous statements. Provide enough information in the question so that the apprentice understands what must be done. Too frequently instructors assume that learners

understand too much about the materials under consideration; questions that may be clear to the instructor or may follow from the context often will not be understood by an apprentice. Also be certain to ask only one thing at a time in questions to avoid confusion. Examples of ambiguous questions overheard in related subjects instruction include: (a) What about labor unions?; (b) What has the most force?; (c) What do you know about pipe?; and (d) Is that too far off? None of these questions is clear Using any of these in a related subjects setting would be more detrimental than useful.

2. Construct *interrogative questions* rather than yes/no type questions. Yes/no questions usually require little thought In fact, they encourage guessing since the respondent always has a 50 percent chance of being correct. Instead, phrase questions so that they ask why, who, what, when and how. Further, use active verbs or words that express what must be done as you construct questions. An example of a question, first phrased as a yes/no type question and then as an interrogative question is:

   Poor: Is there more than one force acting in the hydraulic system?
   Better What are the forces at work in this hydraulic system?

3. Phrase questions directly, in the language of the learner. Avoid giving cues or clues. If the answer to a question is obvious, then the question is not worth asking. The goal in questioning is to stimulate thought and application of information, not merely to repeat the "right" answer. Instructors who leave words out of sentences from the text or who construct questions that sound like they are simply drawn from the text are abusing this guideline A question like, "What is the name of the simple machine that can be used to generate and multiply enough force to pry open a box or lift a heavy object?" is not a useful question A much better question would ask apprentices to apply a variety of simple machines, including levers, to sample situations.

Step 3 Decide How to Use and Actually Use Questions

In addition to deciding why and what you want to ask, you also must decide how you will use the questions in the instructional setting. Use the following guidelines to develop a strategy for questioning

1 Ask fewer questions than is usually the case in most classes. Focus the questions on the more important information and applications under consideration. Use questions that are broad and lead to constructive thought. Instructors often ask too many simple questions under the mistaken impression that they are stimulating thought and discussion. In fact, if the questions do not motivate learners, the instructor actually may be discouraging learner interest. Three questions per major point is usually quite sufficient.

2 Distribute questions equitably throughout the classroom. Ask questions both of respondents who are usually willing to answer and those who often may not be too willing to answer. Eventually, you will bring most learners into the discussion.

3 Use the learner's response constructively. Certainly you must point out and correct misinformation. However, results from many studies of effective teaching suggest that there are several things you can do with answers to encourage learning. First, be prompt in your response after the learner has answered. Second, try to phrase questions so as to encourage the amount of time of learner talk compared to yours. Often it helps trainees to process and learn the information if they hear their peers and themselves talking about it. Third, even if an answer is mostly incorrect, reinforce any portion of the answer that is right while working to get the complete right answer. Fourth, redirect questions and use prompts to extend the question, or questions that might arise from proposed answers, to other trainees. If you can demonstrate the relationship of the information from the first question to a variety of other questions, it greatly improves trainee learning

Step 4: Summaries

At the conclusion of a question and answer session, summarize what transpired in terms of major points of content discussed. This reinforces the major points under consideration.

Factors In The Instructional Setting

There are a variety of factors in the instructional setting that you can control and that have an effect on apprentice learning. These factors include items such as furniture arrangement, teacher talk, and materials. Some of these factors are teacher characteristics, while others are characteristics of the setting or of the instruction. Each of the factors is discussed in turn but in no particular order. Note any factors that may be appropriate to your own instructional setting. Remember that

the underlying idea in providing these ideas is that in apprenticeship the emphasis is upon competence rather than on authority.

Arrange furniture

Arrange furniture, materials and equipment in ways that help to focus attention on the knowledge, skills and tasks to be mastered. Often a traditional classroom set-up simply will not function effectively for related subjects instruction. Do not hesitate to set-up the physical space in any way that helps you to demonstrate or practice or observe a skill... or to stimulate a discussion. Remember, the greatest instructor-learner interaction occurs between the instructor and those in the front and center seats. Therefore, intentionally seek out willing and unwilling respondents from throughout the instructional setting.

Amount of instructor talk

Seek to reduce the amount of time you talk as an instructor relative to the amount of time trainees talk about the content under consideration. Too frequently instructors talk over 85 percent of the time in the instructional setting, even though studies have demonstrated that learner achievement is greatly boosted by increased amounts of trainee talk relative to processing and applying the information or skills.

Use variety of materials

Consider increasing learner autonomy by making available a substantial amount of instructional materials. The variety will help to meet differing learner needs. Further, by permitting and encouraging apprentices to use the materials on their own you help the apprentices to accept the responsibility for their own training and learning outcomes. In fact, results from a number of studies have demonstrated that for adult learners, after the initial presentation, the best instructional materials are those that can be used by individual (or groups of) learners with minimal instructor assistance. However, supervision is required and assistance should be available, if needed.

Be expressive in interaction with learners

For related subjects instruction to be perceived as worthwhile, you must believe and convey the belief that it is important. You must display enthusiasm with your voice tone and expression. Remember, learning can be fun. Incorporate humor into the instructional setting where possible. Also stress the importance of the personal satisfaction gained from doing a job correctly. As you interact with trainees, use a variety of phrases to reinforce or discourage or just talk about behavior. Avoid overuse of certain words or phrases because they

will lose their meaning and emphasis with overuse.

In addition, use gestures, movement, and models to explain information. Do not hesitate to apply these materials to your information presentation.

Offer support to learner

Offer support and praise to the trainees for their on-task learning efforts. Among the things you should do are:

- reinforce time spent on the task,
- support all honest attempts to work out correct answers;
- expand partial answers by using what is correct, to continue the discussion about what is not correct; and
- focus on the task, not the individual.

The last two points are particularly critical. Expanding partial answers not only helps to generate the best possible answer but also demonstrates an effective way of processing the information under consideration. The second point is focusing on the task and not on the individual. This means that when something is done incorrectly rather than saying "You did it wrong," you would say "This is done wrong." The difference is subtle but important. If you say "You did it wrong" you detract from the personal worth of the trainee, from self-esteem and from pride. However, if you say "This is done wrong" you only indicate that a process or product is not acceptable; you have not devalued the performer. Likewise, when you say "This is done well," you contribute to the operational competence of the person performing the task.

Be logical in presenting information

Both how you say something and what you say are important to successful communication. The "how you say something" was discussed earlier in terms of being expressive, animated, varied and honest. The "what you say" is perhaps even more important. There are two points to remember. First, use the language of the learner. Take care to be grammatically correct; even more important, however, choose words and phrases that correspond with the working vocabulary of the trainee. Second, the ideas and information that you present must be logical. They must follow some sensible order. Remember, apprentices are just that. They are not journeyworkers or master craftspersons. Instead, they are just learning the trade. They often know only limited numbers of terms and procedures. *Do not assume that they know or understand too much.*

Example

Doug Green, a related subjects instructor, was charged with providing related instruction for all first and second year mechanics and body and fender workers. He found that his class contained individuals with varying levels of ability, experience and interest. He decided after reading these materials that he could motivate these very different learners by managing the learning environment more effectively. He was particularly interested in improving interaction, in using questions and in incorporating more practice situations into the lessons. While considering the interaction techniques, Green decided to emphasize increasing the amount of time that apprentices talked about the topics under consideration. Specifically, he decided to direct apprentices to find examples or applications at their own workplace for all the key points he listed on the board for each lesson. The examples, one per point, were to be described briefly in writing and turned in at the beginning of the next related subjects instruction meeting. During the class break, Green read the examples and selected three or four for use. During a set-aside time for review of the previous lesson, Green called on the trainee who submitted each selected example to describe and explain it to the rest of the group. Green asked elaborative and clarifying questions that helped to relate the major points and the example. These questions were of the convergent type and focused on the single example. However, before moving on to another example, he also tried to ask one or two divergent type questions that were focused on changing the definition of the problem in order to see if apprentices understood the information. This type of review procedure required almost no advanced preparation time, used about 30 minutes of class time and generated considerable interest among apprentices.

Green also decided to use additional practice in his instruction. He set aside an hour every three related subjects instruction meetings to devote to practice. He used the examples submitted each week by trainees and developed a set of problems to solve related to each lesson. He followed the suggestions outlined in this module and Module #4 and found that they required about one hour of advanced planning in order to prepare handouts and materials. Further, he found that by moving from individual to individual or group to group, he could note limitations in knowledge and skills that needed to be reviewed and retaught. An example of one of the problems presented one night by Green is displayed in Figure 4.

Figure 4: Handout #3: Problems

Setting A car is brought in for service because the owner has found that it is stalling in traffic as she tries to accelerate. You start the car and it sounds like this (play tape). You check the timing, points, and plugs and there is no apparent problem. In order, what things do you check next and how do you know if they are o.k.?

Problems	Procedures
1.	1.
2	2.
3	3.

Additional Information

For additional information on creating and maintaining a positive learning atmosphere, you might wish to read:

N.M. Sanders. *Classroom Questions.* (New York: Harper and Row, 1966).

G.G. Weaver and L. Cenci. *Applied Teaching Techniques.* (New York: Pitorse Publishing Corp., 1960).

Self-Test Exercises

Answer the following questions in the space provided or on separate paper. Check your answers with those provided in the appendix at the back of the booklet.

1. In what ways do the development and use of examples and practice situations differ in the related subjects instructional setting?

2. Suggest strategies for improving instruction in the related subjects instructional setting.

3. Read each of the following questions and critique it in terms of strengths and limitations.

   a) Is a fouled fuel line the correct diagnosis of the problem? _____

   b) Are there mitigating circumstances that override the diagnosis? _____

   c) Why are you using that tool? _____

   d) What is the proper procedure? _____

   e) Can you lift a person in that manner? _____

4. Construct a set of questions to use in your related subjects instructional responsibilities.

3. Skill: Motivate Apprentices To Learn

Introduction And Objectives

Motivation is a key element in learning. It is the force that arouses, directs and sustains the apprentice in a learning situation. Without sufficient levels of this force, apprentices may not be motivated to complete or succeed in related subjects instruction.

There are a number of factors which influence the motivational levels of individual learners. For example, material that is relevant to the personal interests of an apprentice motivates him or her to become more involved in and potentially learn more from the related subjects instruction. Instruction which stimulates trainees' curiosity further motivates them to learn. It is thus the responsibility of the related subjects instructor to incorporate these factors into instruction in order to generate interest, enthusiasm, initiative and, as a result, apprentices who are motivated to learn. This chapter describes the factors that affect motivation and provides some specific motivational techniques for use in apprenticeship related subjects instruction. After completing this chapter you should be able to.

1. Describe the primary motivations for learning;
2. Determine what motivates your apprentices to learn,
3. Describe alternative techniques for increasing motivational levels of apprentices in related subjects instruction; and
4. Apply appropriate motivational techniques in your related subjects setting.

The Nature Of Learning Motivation

From a practical point of view, motivation is the combined force of all the factors that stimulate apprentice behavior, in particular, learning behavior. The primary individual factors or motivators that influence learning are the following:

Achievement—internal desire to succeed and the associated behavior to achieve success.

Social acceptance—the need for social belonging and approval in the instructional setting.

Curiosity—the desire to explore and know more about novel or conflicting stimuli.

Interest—individual patterns of favoring alternative activities and subject matter.

Avoidance—the motivation to avoid unpleasant, situations, or stimuli.

Each of these factors motivates individual apprentices to differing degrees, depending on the instructional surroundings, the social environment, characteristics of the related subjects instructor and personal traits of the apprentice. Thus, you can change the motivational levels of your trainees by altering various aspects of the instructional situation. In the next section, specific techniques and guidelines are presented for arousing, directing and sustaining motivation of apprentices in your charge.

Ways To Motivate Apprentices

There are a number of ways that you, as a related subjects instructor, can motivate trainees. Remember, different techniques will be effective for different apprentices. Much of motivating apprentices is a trial-and-error process of determining and applying what works best for whom. The two-step process that follows provides guidance in using various motivational strategies.

Step 1: Identify Effective Motivators

First, take into account what you know about individual apprentices in order to determine what needs or forces motivate them to learn. This could involve reviewing formal assessment data that you collect, observing apprentices in various work and learning activities, and consolidating in your mind impressions and observations gained from previous related/instruction experiences. From this information, you should have some idea as to which of the five major forces are most effective in motivating individual apprentices to learn:

- Need for achievement
- Social acceptance
- Curiosity
- Interest
- Avoidance

By identifying major motivating forces you will be able to narrow down the selection of strategies and experiences which will be most effective in motivating your apprentices.

Step 2· Provide Motivational Experiences

Next, address the particular motivational needs of apprentices by providing experiences, incentives and reinforcement that arouse and sustain interest. Suggested procedures for accomplishing this are presented, for each of the five motivational forces defined earlier. As mentioned, the selection of particular strategies' with regard to individual apprentices is a trial-and-error process Try out some alternative procedures and if they do not work, try some others All of the procedures represent quality instruction, so they will do no harm. You will know when you are successful because you will recognize motivated apprentice behavior. active, enthusiastic, initiating, participative, exploring behavior.

Need for Achievement

The desire to achieve is a very effective motivator for learning because you often can link achievement directly to some type of learning experience. Also, learning is an achievement in itself. Here are two guide-· lines for developing and particularly maintaining the motivation to achieve in your apprentices:

1. Make clear and meaningful the value of particular learning activities and in general acquiring knowledge and developing skills. Provide your apprentices an incentive to learn by linking that learning with success and achievement in their jobs.
2. Use positive reinforcement and rewards for success in instructional activities. Encourage success among apprentices without building a fear of failure. This can be accomplished by providing instruction that is consistent with their individual levels of achievement and abilities.

Two additional means of increasing levels of achievement motivation in apprentices are: (1) to encourage and reinforce achieving behavior exhibited by an apprentice, and (2) to model achieving behavior yourself so that apprentices may imitate it. Apprentices need to realize that achieving behavior is a desirable thing, by exhibiting· it yourself or reinforcing it in your apprentices, you help them come to this realization.

To accomplish this, you have to recognize what achieving behavior is. Some behaviors that characterize achievement motivation and that should be encouraged or modelled include the following:

- Accepting personal responsibility for one's actions
- Making active attempts to modify the environment (in a positive way)
- ·Setting personal goals and standards of excellence

- Planning activities to achieve one's goals
- Taking calculated risks
- Exhibiting confidence and control
- Having a positive outlook
- Being expressive·

Social Acceptance·

The social environment in your related subjects instructional classroom either motivates or discourages learning in a number of ways. The primary motivational ·force at work is the desire to be accepted. As a·result, apprentices frequently conform to behavior standards accepted by the group. Thus, the extent to which the peer group believes that it is desirable or undesirable to acquire knowledge and skills affects the motivational levels of apprentices'. Take, for example, a training situation where a group of carpentry apprentices is progressing through an instructional unit dealing with weights and measures. Since the carpentry job market is tight, the apprentices are particularly motivated to do well in their apprenticeships. Also, the related instructor has utilized a number of. group learning activities, where, for a group to complete a task, each member of the group has to successfully complete his or her activity. Thus, the social environment of the related subjects course was one of cooperation, where it was desirable to succeed and do well. Now consider a new apprentice entering that learning situation. First, to be one of the group, the apprentice would have to act interested in success. Secondly, because of the importance of group goal achieving, the new apprentice would be pressured by the group to cooperate and succeed. In a different kind of learning environment the apprentice may have been motivated to slough off instructional activities or cause trouble to be accepted by the group.

To the extent you are able, create a social environment where it is desirable to learn. This may not always be possible, but some of the following guidelines may help you modify the social environment of your related subjects instruction.

1. Find out about positive ambitions or interests held by apprentices. Provide a desirable role model based on these aspirations. Introduce apprentices with similar interests and encourage affiliation.
2. Provide small group instructional activities. Competition between groups makes apprentices ·within groups work together. Group goals provide for a positive common bond. Assign apprentices who are not motivated or who act as trouble makers to different groups...or pair them with highly motivated apprentices for team activities.
3. Encourage and reinforce cooperation. When

exhibited by those looked up to by other apprentices, helping and achieving behavior is contagious Use cooperative apprentices as models.

Curiosity

Curiosity is a natural motivator to learning. It arouses apprentices to pursue and explore subjects on their own initiative. It is an inherent characteristic of everyone that you can use to good advantage with proper stimulation. Some ways to promote curiosity in apprentices include the following:

1. Ask thought-provoking questions. For example, introduce a principle or rule and ask your apprentices why they think it is so. What examples of the principle at work can they come up with?. Can they think of any exceptions?
2. Encourage your apprentices to ask questions themselves.
3. Help apprentices find their own answers to questions by providing clues or sources to which they can refer.
4. Promote critical thinking and dissent. Introduce ideas that are debatable.
5. Introduce conflicting or seemingly conflicting materials, principles or ideas. Encourage apprentices to explore and discuss them further.
6. Assign problems for small groups to solve.
7. Bring or encourage apprentices to bring novel materials or objects into the related subjects group.
8. Allow and provide for an in-depth study of subject matter.
9. Reinforce curious behavior.

Interests

Apprentices are more motivated to learn when the subject matter is something of personal interest. Thus, the most useful thing you as a related instructor can do to increase motivation is (1) select topics and materials that are consistent with apprentice interests, and (2) make clear the relationship of the topics and materials with the apprentices' interests and areas of specialization. This is not always possible since requirements of related instruction may not match interests of the apprentices. Some guidelines for making instruction more interesting and as a result more motivating follow.

1. Within limits imposed by course requirements, give apprentices the responsibility to develop and pursue their own objectives, selecting preferred learning methods and materials.
2. Provide learning activities that emphasize application and active participation and result in tangible outputs.
3. Permit and encourage apprentices to present or discuss learning experiences. Talking about their activities increases enthusiasm and interest.
4. Pair interesting activities with those that are not so interesting.
5. Reinforce the completion of a non-interesting activity with one that is interesting.
6. Show interest yourself in activities or topics that are not of particular interest to the apprentices. Your role modelling may create new interests for your apprentices.

Avoidance

A final motivator, or rather a "dis-motivator," is the tendency to avoid those things that cause unpleasant emotions or sensations, such as fear, anxiety, frustration, embarassment, boredom and physical discomfort. To the extent possible, remove these dis-motivators from related subjects instruction. A summary of some conditions and behaviors you should look out for and try to eliminate or avoid is presented in Figure 5.

Figure 5: Conditions That Inhibit Motivation

Instructor Behaviors Causing Fear and Anxiety·

Letting the apprentice know you do not think he or she will succeed.

Associating undesirable consequences with exposure to the learning materials.

Forcing apprentices to perform activities in which they will fail (particularly in front of other apprentices).

Basing evaluation on the relationship of their performance to that of the class rather than on objective standards of success

Threatening failure.·

Being unpredictable about standards of success.

Practices That Cause Frustration:

Learning activities that are inconsistent with apprentice abilities.

Not making known the meaning of the instruction.

Avoiding apprentice questions.

Interrupting an activity in which an apprentice is involved.

Providing no or incorrect feedback on an apprentice's performance.

Testing skills not in the objective of the learning activities.

Practices That Humiliate or Embarrass Apprentices:

Comparing an apprentice unfavorably with others or pointing out his or her mistake with others in public.

Laughing at or belittling apprentices' efforts.

Repeatedly failing an apprentice.

Disciplining an apprentice in public.

Conditions Which Lead to Boredom:

Presenting information impersonally, passively or in a monotone.

Providing no challenge.

Presenting information the apprentice already knows.

Not varying modes of presentation.

Situations Which Cause Physical Discomfort:

Noise and other distractions.

Long periods of standing or sitting passively.

Extreme temperatures.

Working with equipment or tools that are not designed or adjusted properly.

Reading print (on blackboards, books, visuals) that is too small or blurred.

*Note Much of the material in this figure was adapted from Robert F Mager, *Developing Attitudes Toward Learning* (Belmont, California Fearon Publishers, 1968)

Example

As part of an attempt to expand the scope of related mathematics instruction provided to apprentices at a large tool and die manufacturer, Leo Trask was reviewing his overall instructional plan. In thinking back over recent experiences, Trask realized that his instruction was getting a little stale. Apprentices did not seem to ask as many questions as they used to; no one was pursuing topics of special interest or sharing relevant experiences that occurred on the job. The more he thought about it, Trask himself was not as interested in the material as he used to be. So, Trask decided that, as part of changing the scope of the related mathematics, he was going to make an active attempt to stimulate motivation. His first step was to review the instructional materials he was using. He decided to replace 75 percent of them; ordering materials with broader scope, more up-to-date and realistic applications, and a varied set of problems and projects. This alone, Trask felt, would re-stimulate his own interest and provide for instruction that was more relevant to the current needs of his apprentices. He also listed some things he would try to incorporate in instructional activities:

1. Assign more projects and application problems to the apprentices.

2. Permit apprentices to select from and sign up for projects of their choice.
3. Schedule a discussion period where projects are presented and commented on.
4. Before each session, prepare a set of questions to stimulate thought, discussion and further questions.
5. Periodically evaluate success of these activities in increasing self and apprentice motivation.

Trask found that apprentices responded favorably to several of the techniques. The biggest difference seemed to come from his own renewed enthusiasm. In addition, he found the proportion and use of good questions and the closer alignment of related subjects content and current activities on job to be especially effective.

Additional Information

S. Ball. *Motivation In Education.* (Princeton, N.J.: Educational Testing Service; 1977).

I.L. Russell. *Motivation.* Dubuque, Iowa: William C. Brown Col, Publishers; 1971).

J.F. Travers. *Learning. Analysis and Application.* (New York: David McKay Company, Inc.; 1970).

Self-Test Exercises

Answer the following questions in the space provided or on separate work paper. Check your answers with those provided in the appendix at the back of the booklet.

1. List the five primary motivations for learning. Briefly describe how each affects learning.

   a _____

   _____

   b _____

   _____

   c _____

   _____

   d _____

   _____

   e _____

   _____

2. Describe a means for improving apprentice motivation for each of the five categories listed above.

   a _____

   b _____

   c _____

   d _____

   e _____

3. For each of the five motivators you listed in Exercise 1, rate the extent to which your apprentices on the whole possess the motivation. Then consider each of the questions included below.

Fill in the five motivators here:	Are highly motivated by this	Are motivated by this	Are only slightly motivated by this
a.			
b.			
c.			
d.			
e.			

   Are there areas where the group as a whole is low in motivation? How does this affect learning and success in related subjects instruction? What techniques could you use to improve motivational levels of the group as a whole? Do you have any individual apprentices who are particularly unmotivated to learn? Which of the five primary motivators appear to be the problem areas? What strategies could you use to improve the motivational levels of these individual apprentices?

4. Skill: Reinforce Apprentice Learning and Attitudes

Introduction and Objectives

Reinforcement is a tool for strengthening and maintaining behavior It is an extremely important tool for shaping appropriate trainee attitudes and behaviors. As a related subjects instructor, you must recognize the utility of reinforcement for shaping apprentice behavior and be able to incorporate various reinforcers into the instructional process. This chapter contains information and guidelines that will assist you in this aspect of instruction After working through the chapter, you should be able to:

   Distinguish between the reward and informational aspects of reinforcement,
2. Describe the principles of reinforcement as they relate to learning;
3 Apply these principles in the related subjects instructional setting

Characteristics of Reinforcement

Reinforcement is a necessary condition for learning. Without reinforcement, a learner is not informed of the correctness of his or her responses. As a result the learner is unsure about how to proceed in a learning task. Also, in the absence of some type of reinforcement, a learner gains little personal satisfaction from learning and thus has no motivation to proceed.

The two beneficial aspects of reinforcement are satisfaction and information. It is a reward in that it provides personal satisfaction. It is an information source in that it provides feedback on progress.

To clarify the distinction between the two aspects of reinforcement, consider an apprentice auto mechanic who is learning to tune a car. As part of a hands-on learning experience she is practicing adjusting the fuel mixture in the carburetor. The instructor who checks the apprentice's work provides one type of informational reinforcement — whether she did it correctly and if not where was the error A second type of informational feedback is inherent in the task. In this example, if the apprentice adjusts the engine poorly, it will miss, smoke or stall. As the apprentice approaches the correct setting, the engine will begin to sound smoother and smoother. This aspect of the task also has the potential of providing reward to the learner. Completion of a task or set of tasks can be very staisfying personally. Finally, praise from the instructor to the apprentice when she correctly adjusts the mixture provides further reward.

From an information point of view, reinforcement can make the following contributions to learning:

• Reinforcement encourages apprentices to continue behaving in an appropriate way.

• It gives direction to apprentices when they are unsure of appropriate behavior.
• It provides feedback to apprentices when they are correct or have completed a task.

As a reward, reinforcement accomplishes the following.

• Reinforcement provides for personal satisfaction from learning to the point where learning itself may become a reinforcer.
• Reinforcement can serve as a motivator for learning (Motivational strategies are discussed in the previous chapter of this booklet).
• Reinforcement can help to establish a good relationship between the apprentice and instructor.

How to Apply Reinforcement Strategies

Reinforcing apprentice behaviors and attitudes involves four steps:

1. Plan reinforcement — Decide what, when and how you are going to reinforce apprentices.
2. Individualize reinforcement — Apprentices differ in what is rewarding as well as their sensitivity to reinforcers such as praise. Thus, individualize your plan to the extent you are able.
3. Let apprentices know what the rewards and criteria for appropriate behavior will be.
4. Actively reinforce behavior and attitudes.

Plan and apply various reinforcement strategies, using the following guidelines. They are general principles of reinforcement and describe some effective instructional reinforcers.

Principles of Reinforcement

Take the following principles into account when you reinforce apprentices:

1 Use reinforcement immediately following the behavior to be reinforced. The closer the two are in time, the more effective the reinforcement For example, test grades provide more information and reward when test papers are returned promptly.
2. Link the reinforcer to the behavior that is being reinforced If activities occur between the behavior and reinforcer, apprentices will be unsure about which behavior to maintain. For example, if an apprentice did an excellent job on a particular learning activity and subsequently performed an activity in an unsafe manner, your praise or feedback should be related clearly to the behavior you want to strengthen. Otherwise, inappropriate behaviors will be perpetuated or apprentices may feel that you are being inconsistent.
3. Intermittent reinforcement is most effective in maintaining appropriate behavior. Do not reward every correct response an apprentice makes. In terms of

feedback, it may be necessary to provide information on the correctness of each response in order for the apprentice to progress. However, too much feedback is tedious, particularly if there is redundancy.

4 Positive reinforcement is very effective. Design learning activities so that an apprentice will be able to succeed at least some of the time. This way you provide positive reinforcement, rather than informing the apprentice that he or she is consistently incorrect. When negative reinforcement, is required, encourage the apprentice.

5 The stronger the reinforcer the more effective it is in shaping behavior. This will vary substantially between different apprentices. To some apprentices, praise and peer approval are the strongest reinforcers. Others may be reinforced strongly by task completion. The process of discovering what works best for whom will be a trial and error process until you get to know the apprentices better.

Effective Reinforcers

There are a number of reinforcers which have been used to varying degrees of success as rewards or feedback in instructional settings. The following paragraphs describe the various reinforcers, pointing out their relative effectiveness and strengths and limitations. Take this into account when planning to reinforce learning, but keep in mind that effectiveness will depend on individual learner characteristics.

Instructor Praise

Praise from the instructor may be very effective when it follows an appropriate behavior by the apprentice. When paired with information, praise can be used to refine behavior. For example, provide praise and encouragement to an apprentice who makes progress on a learning activity in addition to feedback which tells the apprentice how to proceed or how she/he might further improve performance.

There are, however, two potential difficulties in using praise as a reinforcer. First, it must be associated with some type of evaluation. That is, either through testing or observing the apprentices at work, you must collect information as to how the apprentice is progressing in order to provide feedback. Since testing is generally an infrequent occurrence, this does not allow you to provide feedback on a day-to-day basis. Also, while much information can be obtained by observing and interacting with apprentices, it is difficult to observe individuals regularly in a large group of apprentices in related subjects instruction. Secondly, if instructor approval is not important to apprentices in the group, praise may have just the opposite effect as was intended. Disapproval from other apprentices may override your praise, making the reinforced behavior undesirable for the apprentice.

Despite these potential limitations, praise should be a major tool to you in reinforcing desired behavior patterns. Use it discriminately, fairly, and if necessary in private. You will notice a tendency for apprentices to repeat those behaviors that you reinforce.

Grades

For grades to be successful reinforcers, they should exhibit three characteristics. First, the grades or scores must be linked to the behavior which is being evaluated. If an apprentice receives a grade of C on a test, but is not informed which behaviors (or attitudes) were desirable and which were inappropriate, the reinforcement value of the grade is reduced. Second, there should be a rationale for the grading system. Comparing apprentice behavior with other apprentices may be reinforcing for those near the top, but on the whole this is a poor rationale for grading. A criterion-based system, where an apprentice's performance is compared with a predefined standard of success, offers a rationale which is easy for apprentices to accept. Finally, the system should provide consistency in assigning grades. If the apprentice does not believe that his or her behavior causes the grade, the behavior will not be reinforced. Again, a criterion-based system, with its objective standards, enables the instructor to be consistent.

Evaluation is a necessary part of related subjects instruction. Thus, an entire module in this series is devoted to the topic.* In applying the procedures suggested in that module, keep in mind the reinforcement potential that grades can have for some or all of your apprentices.

Competition

Related to the notion of grades is the reinforcing value inherent in winning a competitive event. Remember, competition is an effective motivator for those who do very well. If you can design competitive events where everyone wins occasionally, they can be useful. Inevitably, though, there are the few trainees who are always losers. An alternative approach is to design group competition activities. This evens out the odds of success, while encouraging cooperative behavior and building norms for success within groups.

Peer Approval

Peer approval is an extremely strong reinforcer of apprentice behavior. Either it will complement your efforts or interfere with your attempts to reinforce behavior if group priorities are inconsistent with learning. When it interferes, try to modify group norms to be more consistent with the goals of related subjects instruction. This problem is discussed in the chapter of this booklet dealing with motivating apprentices to learn.

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*See *Evaluating Apprentice Performance*, Instructor Training Module #9.

Task Completion

A most useful and effective reinforcer proves to be the gratifying effects associated with completing a task. Some apprentices are naturally rewarded by task completion For others you may have to nurture this feeling. This can be accomplished by providing other types of reinforcement along with task completion. If the successful completion of an activity is paired a sufficient number of times with other rewards, the completion in itself will begin to be rewarding. Consider for example an apprentice who consistently does not do his assignments. His instructor plans to use reinforcers that will encourage the apprentice to complete his assignments. The instructor's first move is to try a negative reinforcer to get the apprentice to complete his assignment the first time — if the behavior does not occur at all you cannot reward it So the instructor talked with the trainee's job supervisor who then threatened a less desirable work assignment if the trainee did not complete his related subjects work After the trainee completed the assignment, the instructor resorted to positive reinforcement by appointing the apprentice as leader of a group instructional activity The next week the instructor enlisted the assistance of the job supervisor, whom the apprentice respected, to provide praise for completing related subjects assignments By this time, the apprentice was beginning to respect the instructor and to accept her praise as reinforcement Eventually, success in related subjects instruction became rewarding in itself.

Task Feedback

Oftentimes feedback must be incorporated into the task to indicate when an activity is completed successfully. In criterion-based training, standards for success are made clear to apprentices before an activity is begun. Feedback can be provided by you the instructor in observing apprentice behavior. Also feedback can be provided by the task. For example, you can provide apprentices answers to learning exercises so that they can check their own progress. Remember that, if the task itself does not provide feedback — such as the example of adjusting the carburetor — you must provide information to the apprentices as to the adequacy of their behavior.

Non-reinforcement

Non-reinforcement can occur in two ways. It can be unintentional where an instructor is too involved in other activities to reinforce appropriate behaviors when they occur. This can be detrimental to apprentice learning since even learned responses will tend to fade after a period with no reinforcement. Those responses which are not learned will never be acquired if information as to their correctness is not provided.

Non-reinforcement also can be used purposefully by the related subjects instructor. In this case inappropriate behavior is not reinforced (ignored), because the instructor wants the behavior to fade. Such a strategy may be useful for disciplinary problems, which are discussed more fully in module #8. But remember you must also couple non-reinforcement with rewards for and information regarding the appropriate behavior.

Example

Allen Newton teaches a course entitled, Working in Organizations, at a community college. The course deals with all aspects of work, including such topics as taking criticism and directions, appropriate dress and grooming, labor unions, supervising employees and so on. Newton frequently has apprentices from a number of different local firms in his class, thus he tries to individualize course content and activities to the extent possible. As part of the individualized planning, Newton plans how to reinforce learning. He utilizes a variety of self-teaching materials and incorporates feedback into learning exercises so that the apprentices can 1) determine whether they have completed assignments successfully, 2) realize where they made errors, and 3) be directed as to how they can improve their performance. He also makes an effort to find out which of the apprentices require more of his help and praise as reward for completing a task. Next, he makes clear how trainees' learning will be evaluated and what rewards they will gain through the completion of the instructional activities. He is careful to point out the value of their mastering instructional content to their success in the working world. As appropriate, he also mentions more intermediate rewards that they may expect to experience in the classroom:

1. Working together on group activities.
2. Perfecting job interviewing techniques.
3. Completing 45 hours of related subjects instruction.

Finally, Mr. Newton applies his planned reinforcement strategies in the classroom and revises them based on their success in providing for individual learning. Over several years he has found that with the majority of trainees, task feedback and task completion either are or can be shaped to become the most effective reinforcers. This has the positive effect of increasing apprentice pride in work and concentration on learning the competencies of their selected trade. He occasionally has had difficulty with peer approval because a minority of

trainees did not always relish being involved in related subjects instruction. Usually he was able to overcome this potential problem by working with the trainees' on-the-job supervisor and by requiring the apprentice to invest time in producing examples from the workplace that illustrated the major points made in class. Newton found that, over time, the greater the investment of time he could get from apprentices, the greater they valued the related subjects instructional experience.

Additional Information

Principles of reinforcement are discussed in most basic educational psychology books.

Other references you may wish to consult include.

I.L. Russell. *Motivation* (Dubuque, Iowa: Wm C. Brown Co., Publishers; 1971).

J.P. Houston. *Fundamentals of Learning* (New York: Academic Press; 1976).

Self-Test Exercises

Answer the following questions in the space provided or on separate work paper. Check your answers with those provided in the appendix at the back of the booklet.

1. What are the two ways that reinforcement assists in learning?

_____   _____

How do they differ?

_____

_____

_____

_____

2. Describe what the following principles of reinforcement mean in terms of applying them in instruction.

a. Immediate reinforcement —

b. Linking behavior and reinforcer —

c. Intermittent reinforcement —

d. Positive reinforcement —

e. Reinforcement strength —

3. List four reinforcers of apprentice behavior. How have you applied them in related subjects instruction in the past? Can you think of any other applications of the reinforcers?

a. _____   a. _____

b. _____   b. _____

c. _____   c. _____

d. _____   d. _____

5. Skill; Order Lessons and Activities So Each Builds on Previous Lessons

Introduction And Objectives

Ordering lessons and activities so that each builds on previous lessons and materials often is called "sequencing." It is one of the more difficult teaching skills to master. It is important in related studies for at least three reasons. First, many skills and complex knowledges build on more elementary information that must be mastered prior to undertaking and learning the more complex skill or information. Sequencing materials is the only certain way of insuring that the necessary, simpler information is addressed first. Second, ordering lessons or sequencing materials is a means of drawing together or organizing all of the proposed content for a related subjects instruction course. It will aid you in preparing your daily lesson plans, will assist you in reporting outcomes to the program sponsor, and will enable apprentices to understand better the entire content expectations for their training period. Third, some of the trainees in your charge will not have done particularly well in formal schooling. Primary reasons for their difficulty with traditional schools usually included lack of understanding about expectations, rules, and responsibilities; lack of association between the content of instruction and their own daily lives; and boredom, disinterest and frustration from either having the same information repeated again and again, or from having failed to master some basic information and never having been able to catch up or even figure out exactly what materials they had missed. Sequencing information and making known to apprentices the prescribed order is an excellent way to help establish favorable differences between related subjects instruction and traditional, formal school.

Sequencing or ordering content is difficult. It requires that you be thoroughly familiar with the skills and information that make up the content; that you understand the application and use of the information in the work place; and that you use one (or more) of several techniques for sequencing information or ordering content. The last of these requirements, the several techniques for sequencing information, is the concern of this set of materials. At the conclusion of your work in this unit, you will demonstrate your competence in the skill by being able to:

1. Describe alternative procedures to sequence or order content; and

2. Suggest those procedures that are most useful in given situations.

As you work your way through these materials, think about how you might sequence effectively the content of your related subjects instruction.

Why And When To Use The Skill

Remember, sequencing is valuable as an organizing device. It helps insure that all critical points are covered at the appropriate times, and it helps to motivate learners and eliminate frustration. It also can be useful in individualizing instruction since it will assist you to match lessons to learner needs. This is particularly helpful as you consider the newness and complexity of the information in order to decide how much time can be spent or needs to be spent on various lessons.

Sequencing content usually occurs at the beginning of the related subjects instructional period. However, you may need to adjust the content throughout the instructional period based upon the progress and the on-the-job training needs of apprentices.

How To Sequence Or Order Content

There are several different ways to sequence or order materials. No particular model is necessarily superior to any other model. Instead, your decisions about which model to use should be based on the type of content to be sequenced and the abilities of the trainees who will use the materials.

Several models for sequencing content are discussed on the following pages. You might use any or all of the models at some point in related instruction; however, regardless of which model you choose to sequence content, your first task is to review carefully the performance objectives, noting the proposed outcomes and the conditions under which the final performances are to be given. Using that information will help you to determine exactly what you want to teach, at what time, and in what order.

Five sequencing procedures are suggested: (1) simple-to-complex; (b) chronological; (c) concrete-to-abstract; (d) general-to-specific, (e) specific-to-general. Each technique is discussed in terms of how it is used. Addi-

tionally, a checklist is included to help you decide whether the technique is appropriate to what you are doing. Remember, the types of sequencing discussed here are focused on ordering information within single units of content or within single lessons. However, you can apply the same general ideas to the ordering of content for entire years or terms of apprenticeship of related subjects instruction.

Simple-to-Complex Sequence

The simple to complex sequence involves arranging the content in an order so that mastery and understanding of the necessary and elementary elements of information is achieved before proceeding to the more difficult information and elements. The more simple information is used as a building block to the more difficult knowledge It also permits trainees to realize that they have achieved success with initial learning and motivates additional learner effort. Most manual skills such as operating a machine or driving a vehicle can be taught well using this sequencing technique. The idea is to break down all complex actions into simple, component parts First you teach the component parts, next you teach the combining of the parts; finally you teach the entire complex action and the information associated with it. Each piece of information helps build a structure upon which the capping or terminal skill rests; the terminal skill is the ultimate performance objective. Progress is measured by assessing the apprentice's mastery of subordinate skills and information Figure 6 illustrates the simple-to-complex sequence.

Among the questions you should consider in making a decision about whether to use this procedure to order content are:

Yes No

1. Consider the component parts of the final performance objective. Are there skills and knowledges that can be mastered independent of the final performance and must they be mastered before the final performance can be enacted?
2. Would it be helpful to review content and skills covered previously in your efforts to teach the new content?
3. Is mastery of the content under consideration necessary as a foundation for more complex skills and information?
4. Are some aspects of the material learned more quickly and easily than others?
5. Are various portions of the content fairly simple while others have many aspects and factors to consider?

If "yes" is the answer to at least four of these questions, you may want to use the simple-to-complex sequencing technique.
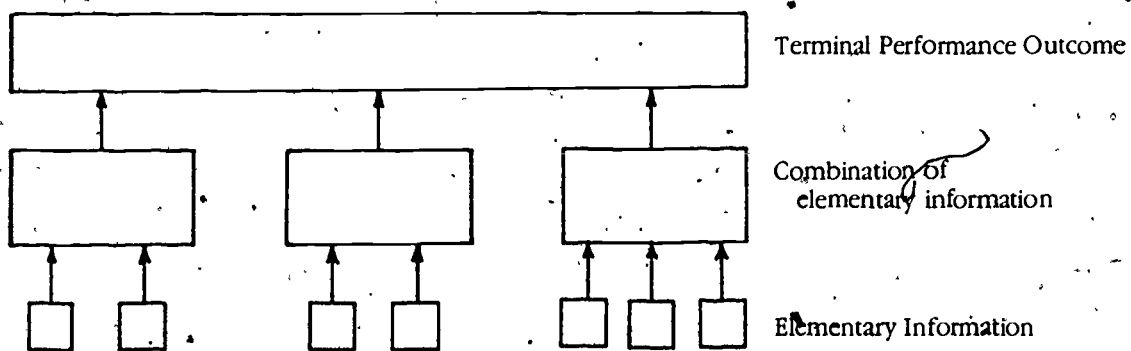

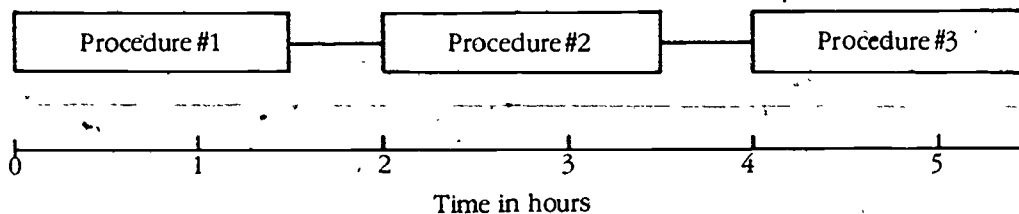
Figure 6: Simple-to-Complex Sequence
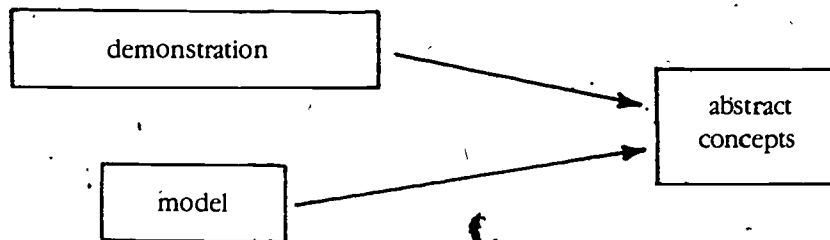
Figure 7: Chronological Sequence

Figure 8: Concrete-to-Abstract Sequence

Chronological Sequence

Chronological sequence is perhaps the most simple procedure for ordering content. It is especially useful for teaching a particular process or type of operation with relatively uncomplicated machines. You use the procedure when you arrange in a specific pattern the order of occurrence or time periods for a set of operations or activities. It establishes a fixed order to and relationship of the events you present to each other, in addition, it establishes this pattern as the expected and accepted procedure. Figure 7 illustrates the chronological sequence.

Among the criteria you should consider in making a decision about using this procedure to order chronologically are:

Yes   No

____   ____   1. Does the content require that patterns or consistencies by noted and explained?

____   ____   2. Is there a prescribed order to the activities, tasks, events, procedures or information that you must teach?

____   ____   3. Does the information emphasize timing or time periods?

If "Yes" is the answer to two of these three questions, chronological sequence may be the most appropriate for you. Its basic limitation is that it can become cumbersome if great amounts of information must be presented.

Concrete-To-Abstract Sequence

The concrete-to-abstract sequence is a particularly effective procedure for use with adults who are unfamiliar with the content under consideration. The technique involves presenting manipulative, visual, demonstrable, non-abstract information first and using it as building blocks to teach abstract concepts. The physical manipulation and observation of events is the basis of the more abstract and symbolic information that often will be presented as analogy. The concrete learning information usually can be perceived by more than one means such as touch, sight or auditory understanding. In this way, the information is more easily understood and remembered. Therefore, it frequently can serve as a point of reference from which to begin when processing more complex and abstract information. Such presentations also help overcome language and vocabulary difficulties with new materials. Information such as models, parts, tools, pictures and demonstrations are the most frequently used types of materials in concrete presentations. Figure 8 illustrates the concrete-to-abstract sequence.

Among the questions you should ask of the content when trying to decide whether to use this procedure are:

Yes   No

____   ____   1. How much and what parts of the content can be taught in a concrete, manipulative manner?

____   ____   2. Does the content contain abstractions, concepts and rules to be taught?

____ ____ 3 Can the abstractions be related to
concrete materials that can be
taught first?

____ ____ 4. Do the abstractions provide a more
complete understanding of the
content?

If "Yes" is the answer to these questions, then
probably the concrete-to-abstract sequence would be
appropriate for you to use

General-to-Specific Sequence

A fourth way of ordering information is termed a
general-to-specific sequence. This technique means that
the entire final outcome and use of the information is
presented first as an overview to demonstrate the pur-
pose and intent of instruction. Then more specific and
detailed information about components of the total in-
formation and skill base can be presented. The over-
view helps learners to categorize specific information
and to determine the relationships of the various
specific information to each other. General-to-specific
sequences are especially useful when presenting large
amounts of moderately difficult information. Fre-
quently science topics can be presented in this fashion.
Figure 9 illustrates the general-to-specific sequence for
ordering content.

Among the questions you should ask in order to deter-
mine if the general-to-specific sequence is appropriate
for you to use are:

Yes No

____ ____ 1. Can you present the overview of
the information in a concise and
useful manner?

____ ____ 2. Can specific information, concepts
and examples be grouped into cate-
gories that can be presented as part
of a total picture?

____ ____ 3. Can the meaning of the whole of
skills and information be enriched
by emphasizing the similarities and
differences among component
parts?

____ ____ 4. Can specific information, character-
istics, actions and requirements be
deduced from more general state-
ments?

If "Yes" is the answer to these questions, then per-
haps the general-to-specific sequence would be useful
to you.

Specific-To-General Sequence

The fifth way to sequence information is termed the
specific-to-general mode of ordering. Frequently it re-
quires you to provide more guidance to the learner be-
cause the overall picture will not become clear for some
period of time. However, it does encourage active par-
ticipation and thorough understanding. It is similar to
both the concrete-to-abstract and the simple-to-com-
plex sequencing procedures in that each step usually
involves use and presentation of progressively more
difficult information. It differs from concrete-to-ab-
stract sequencing because frequently the information
presented in the specific-to-general sequence will be
largely abstract at all levels. It differs from the simple-to-
complex sequencing because much of the basic infor-
mation will be complex while terminal information may
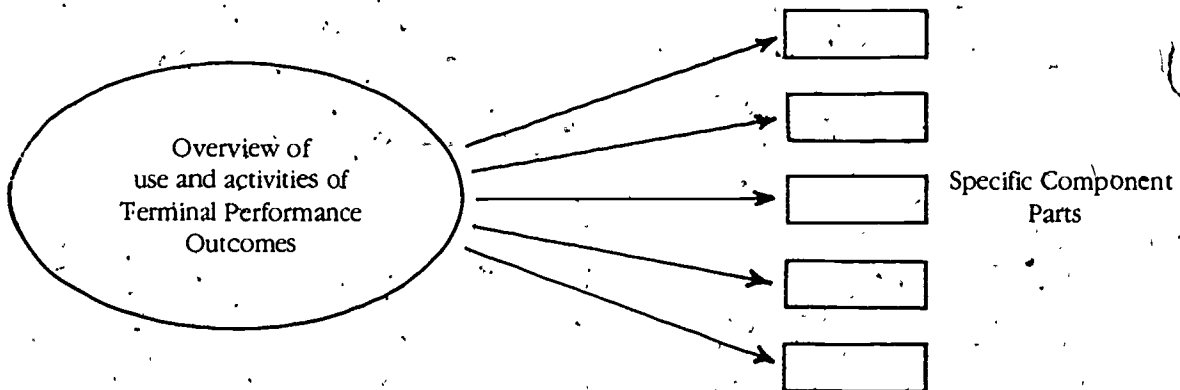be application or additional combinations or divisions
of original information.

Figure 9: General-To-Specific Sequence

```
                    ┌─────────────┐
                    │ Application  │
                    │     of       │
                    │  Principles  │
                    └─────────────┘
              ┌──────────┐    ┌──────────┐
              │Hypothesis│    │Hypothesis│
              └──────────┘    └──────────┘
            ┌──────────────────────────────┐
            │Possible Explanations, Similarities│
            └──────────────────────────────┘

  ┌──────────┐      ⟨ Concept  ⟩      ┌──────────┐
  │ Trial of │◄───► ⟨ Formation⟩ ◄───►│World of Work│
  │Explanations│                      └──────────┘
  └──────────┘

       Facts       Facts        Facts
```
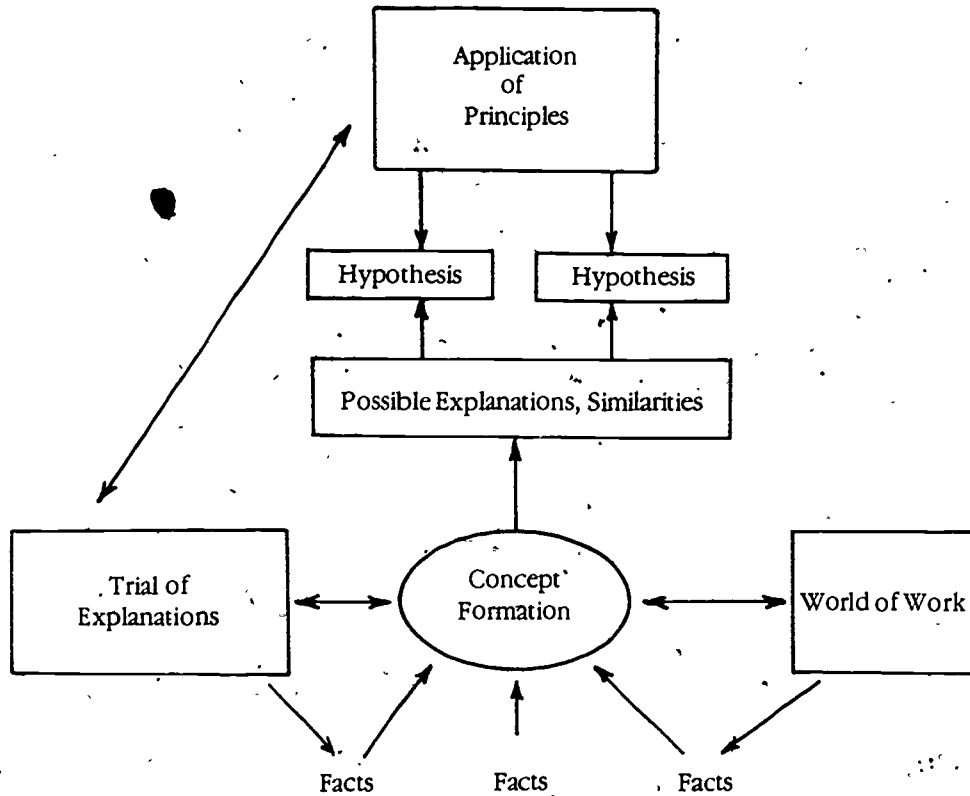
Figure 10: Specific-To-General Sequence

The specific-to-general sequence consists of three processes. The first task is organizing information that was previously unorganized. This may require grouping information, categorizing items or groups, and abstracting common characteristics. It is a kind of concept formation drawn from raw data. The second task focuses on interpreting the collected and grouped data. This involves forming generalizations, extrapolating to new events, identifying cause and effect relationships, tracing similar aspects of selected topics and attempting to infer logical implications of events, based upon known facts. The third task is to apply the facts, generalizations and conclusions. This involves generating predictions of consequences, explaining predictions, formulating and testing hypotheses, and using the information to solve problems in the work setting. Your responsibilities in using this sequencing technique are to guide the learners through the steps of the model and to help them maintain the necessary thread of logic. Figure 10 illustrates the specific-to-general sequence.

Among the questions you should ask when considering use of this sequencing procedure are:

Yes   No

_____ _____ 1. Can common properties of specific information be abstracted as generalizations that help organize the information?

_____ _____ 2. Do the generalizations and concepts offer explanation about why and when certain things occur?

_____ _____ 3. Based on the generalizations can you predict other occurrences or activities?

_____ _____ 4. Given the prediction, can you test the validity/usefulness of the prediction?

If you can answer yes to these questions, then perhaps the specific to general sequencing order will be useful to you.

Example

Lloyd Walter was a related subjects instructor in a graphic arts apprenticeship training program sponsored by a major publishing company. Walter's particular concern was apprentices in the bindery operations. His class contained apprentices from the book, newsletter and advertising sections of the plant; therefore a variety of different skills needed to be taught at different times.

Figure 11: Sequencing of Portion of Bindery
Related Subjects Instructional Materials

Content	Topics	Sequencing Techniques
Background	Safety	Simple-to-complex
	Tools	Simple-to-complex
	Nomenclature	Simple-to-complex
	Lubrication	Chronological
	Knife changing	Chronological
	Squaring gauges	Chronological
Stock	Estimating	Simple-to-complex
	Counting	Simple-to-complex
	Jogging	Simple-to-complex
	Handling	Simple-to-complex
Gauges	Single	General-to-specific
	Double	General-to-specific
	Triple	General-to-specific
	Fourth	General-to-specific

Further, different content needed to be taught in different ways. Walter decided first to lay out all necessary content and then to sequence the content within units in order to help individualize instruction. Figure 11 displays some of Walter's prescribed content, specifically, that relating to paper cutting. Note that the figure includes Walter's decisions about how to sequence broad topics within the content. His ideas are reflected in the order of subjects presented as well as his labeling of the sequencing procedure.

Note that within the three units, Walters used different sequencing techniques In each case, he matched the characteristics of the content with the attributes of the sequencing technique. Therefore, for example, he decided to use the simple-to-complex model for discussing safety precautions while using the chronological technique for presenting information on squaring gauges.

Additional Information

For additional information on sequencing content, you might wish to refer to other sources such as:

J.R. Verduin, H.G. Miller and C.E. Greer. *Adults Teaching Adults: Principles and Strategies.* (San Diego, Calif.: Learning Concepts; 1977).

J. Weigand. *Developing Teacher Competencies.* (Englewood Cliffs, N.J.: Prentice Hall; 1971).

Self-Test Exercises

Answer the following questions in the space provided or on separate work paper. Check your answers with those provided in the appendix at the back of the booklet.

1. Read each of the following descriptions and name the sequencing technique that best describes the definition.
   a. The events or actions are presented in order of occurrence.
   b. An overview is presented in order to introduce and explain component parts.
   c. Mastery of advanced skills requires mastering more elementary information.

2. Read each of the following scenarios and suggest a type of sequencing that would be appropriate for use.
   a. Barry Doss teaches related subjects in a welding program. Included in his content is material related to arc welding build-up techniques, using a rod, single-pass build-up, and weave build-up. How would you recommend that he sequence the materials?
   b. Wayne Owens teaches related subjects instruction to apprentice machinists. Part of the subject matter he must present is information on algebra including materials on signs, the concept of unknowns, solving for no knowns and solving complex equations. How would you recommend that he sequence the materials?
   c. Sarah Wilhoit teaches related subjects to apprentice drafters. Among the topics she presents is information on the transition of drafting practices from wet blue prints to electrostatic copies and ink to paste letters. How would you recommend that she sequence the materials?

6. Skill: Organize Class For Smooth Transition Across Time, Materials, Content And Activities

Introduction And Objectives

Managing and directing learning activities in ways that contribute to effective learning, requires, among other tasks, organizing and conducting instruction in a way that makes for smooth transitions across time, materials, content and activities. Smooth transitions eliminate the sources of most disruptions, demonstrate the interrelatedness of ideas and content under consideration, maintain attention, and demonstrate prior organization and preparation. Making smooth transitions is a skill you can master and use effectively in many settings. After you begin to use it regularly in related subjects instruction, it will become almost second nature to you. When you have completed your work in this unit of materials you will demonstrate your competence by being able to:

1. Suggest and discuss the factors or steps that can be used to establish smooth transitions in instructional settings; and
2. Analyze instances of transitions and suggest remedies for problems that are noted.

As you read the materials, think about the transitions that you use or have seen used in related subjects instruction activities.

What, When And Why To Use The Skill

Smooth transitions are necessary for disruption-free and effective lessons. They establish a pattern of little wasted time and demonstrate the importance of remaining focused on the work tasks at hand. Further, smooth transitions help to suggest the relationship between subjects being covered, help to reinforce learning interrelated information, and help to establish a rhythm of information presentation that makes the time spent in class seem to pass quickly—an important note after a full day of work on the job.

Smooth transitions are called for during every instructional session. When they are practiced, they are rarely noticed, however, if an instructor does not have or use the skill, the result is obvious to all. It generally results in a great deal of wasted time—and wasted time is not affordable in related subjects instruction.

How To Use The Skill

Smooth transitions are not flashy. In fact, they usually appear to be effortless. However, they do require prior preparation and effort. Your efforts can be simplified by using the following practices:

Step 1: Give Clear Instructions

At the outset of any instructional lesson or exercise provide a clear set of directions and instructions. Indicate exactly what is to be done; why; when; how; and for what purpose. Explain what to do when a trainee needs assistance, what to do when one has completed his or her work and what standards will be used to determine if the work is acceptable. In addition, usually it is helpful to encourage and answer questions apprentices may have about the directions as well as to check for apprentice understanding. More specific suggestions about giving clear directions are explained in Module #5, *Presenting Information*.

Step 2: Maintain Attention

A second step in making smooth transitions is maintaining attention. The more you focus attention on the information and skills under consideration, the more potentially distracting events you will eliminate. Among the strategies you should use to maintain attention are: (a) relate the information to daily life of trainees through examples and illustrations; (b) vary the ways and means you use to present information; (c) involve learners in applying information by asking for examples, questioning, and requiring demonstrations; (d) focus trainee attention directly on information at hand; and (e) allow time for apprentice responses and comment on their responses. You need not feel or be in total control, but you must direct activity.

Step 3: Adjust Lessons As Needed

Pacing materials and meeting individual learner needs are an important part of creating smooth transitions. Vary the style and content of presentation and material over time to avoid boredom. More important, monitor progress of the apprentices for whom you are responsible. When verbal and non-verbal cues indicate restlessness, change what is going on. Teach in shorter segments, use frequent brief breaks, and actively involve trainees in processing information with their peers. However, always remember that you must not do for trainees tasks that they can perform for themselves.

Step 4. Develop and Use A Standard Technique For Drawing Lesson To Close

Developing and using a standard procedure or technique for drawing a lesson to a close helps establish smooth transitions The idea is to maintain trainee attention while, at the same time, subtly signaling that new activity is about to begin One good way of establishing a standard routine is to end each unit and lesson with a summary You can provide the summary or you can ask learners to summarize the principal points under consideration. Use this technique as you conclude a brief discussion of examples of how the information is used on the job Some instructors call giving of examples a discussion and follow it with a brief wrap-up before introducing new objectives and materials. Other instructors mark the conclusion of each unit with a test or quiz followed by objectives for the next unit. Still others fail to distinguish between old and new materials.

Step 5: Establish A Daily Schedule For Each Related Subjects Meeting And Try To Follow It

Transition activities are best carried out by announcing to apprentices exactly what will happen during each instructional period and sticking to the schedule When changes need to be made, announce them in advance and alter the schedule so everyone knows Schedule information should include time, topics, type of presentation and type of content sequencing.

Posting and discussing the daily schedule is a valuable aid to smooth transitions. It establishes expectations and reduces anxiety. It makes the related subjects experience more like the work experience and less like traditional school. Most importantly it helps to create an atmosphere in which everyone acts within expectations. When instructors and trainees learn that they can count on the events listed on the schedule to occur, then the anticipation is created that activities will flow smoothly from one to another in order to complete the prescribed work. Remember to post the schedule so everyone can see it.

Step 6: Be Prepared and Explain Actions

The last step in the process of using smooth transitions is called "be prepared and explain actions." It means that first you must plan and organize each lesson and remain at least one related subjects instructional period ahead of the lessons you are presenting this day or week. Therefore if you run out of things to do in any one period and have time left, you can move im-

mediately into something else you need to do This is important, given the limited amount of time you have available for related subjects training.

Second, as you prepare the lesson, consider how you will introduce and draw to a close the lesson. Exactly how will you relate the new information to information and skills addressed in the past and how will you relate the knowledge or skill to the apprentice's work through examples and illustrations? Considering such questions before presenting the information ensures that you will be prepared during the presentation effort.

Self-Test Exercises

1. List the steps involved with making smooth transitions in related subjects instructional settings.

   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____

2. Read each of the following scenarios. Diagnose the problem associated with smooth transitions and suggest a reasonable remedy.

   a. The instructor generally built and posted a schedule of activities. He even explained what was going to happen before it did and tried to relate content to other content by summaries and examples. Nevertheless, apprentices seemed to lose interest and grumbled about the class. What would you recommend? _____

   b. The instructor posted and discussed a schedule for each class period. Nevertheless, he always lost time in transition at the prescribed time, he simply would stop the lesson, take a break and resume with a new lesson. What would you recommend? _____

Additional Information

For supplemental information on the topic of making smooth transitions, you might wish to read:

V.F. and L.S. Jones. *Responsible Classroom Discipline.* (Boston, Mass.: Allyn and Bacon; 1981).

7. Appendix

Answers to Self-Test Exercises

2. Skill: Establish Positive Learning Atmosphere of Interest, Enthusiasm, Respect and Positive Interaction

1 *Examples* provide a second way to view the information under consideration. They are used to make the knowledge and skills real, practical and useful to apprentices. Examples take a variety of forms.

Practice provides an opportunity to apply the knowledge and skills being learned. It not only provides insights, but also increases confidence in and ownership of the skill or knowledge. Practice situations can be developed from examples, are usually simulations or problems, and offer you as an instructor an opportunity to evaluate learning to date.

2. a. Reduce amount of time instructors talk while increasing trainee talk about task.

    b. Arrange seating to facilitate discussion.

    c. Offer support for lesson answers and expand trainee comments.

3 a This is a yes/no question. Offers little chance for learning and goes nowhere. Tone of question could be a clue.

    b. This question is ambiguous and is written using inappropriate vocabulary.

    c. This is an ambiguous and confusing question.

    d. The question is ambiguous.

    e. The phrasing is ambiguous; sounds like a yes/no question that will produce little learning.

4. Review your questions in conjunction with the guidelines offered in Chapter 2.

3. Skill: Motivating Apprentices to Learn

1. The primary motivators for learning are:

    a. Achievement motivation, where the internal desire to succeed motivates an apprentice to learn.

    b Social acceptance, where the apprentice learns in order to be accepted by the instructor or other apprentices.

    c. Curiosity or the desire to learn more about new or conflicting things.

    d. Interest is a desire to pursue and thus learn about areas which are personally stimulating.

    e. Avoidance motivates apprentices to avoid unpleasant situations.

2 Sample procedures for motivating apprentices in each of the areas are the following. You can check your answers against techniques discussed in the test on pages 39–45.

    a. Act more achievement-oriented myself.

    b. Assign group project activities.

    c. Schedule a discussion question and answer period.

    d. Assign to each apprentice the task of finding an application of a particular principle in his or her job situation.

    e. Provide more challenging learning activities.

4. Skill: Reinforce Apprentice Learning and Attitudes

1. a. Reward   b. Feedback or Information

    — Reward is the personal satisfaction component of reinforcement and encourages the repetition of rewarded behaviors.

    — Feedback gives a learner information as to the correctness of a response so that he or she may adjust the next response accordingly.

2 a. Immediate reinforcement is applying reinforcers immediately after the behavior to be reinforced occurs.

 b Linking behavior and reinforcer means that you must indicate which behavior is being reinforced. ced.

 c Intermittent reinforcement means that it is best to not reinforce every correct response.

 d It is better to use positive reinforcement than negative reinforcement when possible.

 e. The stronger the reinforcer is to a learner, the more effective it is.

3 Compare your answers with the following reinforcers. You may have listed some other reinforcers which we did not discuss (For example, time off for good behavior or payment of stipends). Can you think of any other effective reinforcement strategies?

 a. Praise

 b. Grades

 c. Competition/Winning

 d. Peer Approval

 e. Task Completion

 f. Task Feedback

 g. Non-reinforcement

5. Skill: Order Lessons and Activities So That Each Builds on Previous Lessons

1. a. Chronological

 b. General-to-specific

 c. Simple-to-complex

2. a. Simple-to-complex

 b. Simple-to-complex

 c. Chronological

6. Skill: Organize Class for Smooth Transition Across Time, Materials, Content and Activities

1 a. Give clear instructions

 b. Maintain attention

 c. Adjust lessons as needed

 d. Develop and use a standard technique for drawing lesson to a close

 e. Establish daily schedule for each meeting and try to follow it

 f. Be prepared and explain actions

2. a. Shorten lessons and divide content to adjust to trainee attention span. Maintain attention by focusing on major points, by relating information to work and involving learners in example and illustration process.

 b. Develop a standard technique for closing a lesson such as a summary statement and a set of examples that relate the information to the work of the trainees. He also might explain actions and focus on maintaining attention by developing participation.

Posttest

Directions

Read the following questions and write your answers in the spaces provided. Check and score your answers with the suggested answers that follow the questions. If you answer at least 65 percent of the questions correctly, continue your work in Module #7. If not, repeat the sections of this module with which you had greatest difficulty.

1. List the limitations of the following question.

   What tool should you use? _____

2. List the strengths of the following question.

   What is the correct procedure for roughing-in a basin? _____

3. One of the most effective practice situations is problem solving. What are the general steps in problem-solving?

   a)

   b)

   c)

   d)

4. Circle the letter of the item that best describes the relationship of practice to examples:

   a) Practice situations often can be developed from examples.

   b) Examples provide a better opportunity for evaluation than does practice.

   c) Neither practice nor examples noticeably influences trainee confidence.

   d) Both practice and examples deal only with concrete information.

5. Read the following description of an instructor's comments and indicate in the space provided at least two conditions you observe that inhibit motivation.

   "I doubt if anyone can do it, but I want Jenkins to try to demonstrate how to cut this joint. Then everyone will try. The person who comes closest to doing it right gets a B; everyone else gets a D."

   Answer _____

6. Circle the letter of the item that is not usually an effective motivator with apprentices.

   a) Need for achievement

   b) Social/peer acceptance

   c) Curiosity

   d) Interest

   e) Avoidance

   f) Grades

7. What two functions does reinforcement serve?

   Answer (a) _____ (b) _____

8. Read the following scenario and suggest a type of sequencing that would be most appropriate for use.

   Hector Grunch is a related subjects trainer who teaches mathematics and measurement. Topics within measurement include (a) tools, tool use and storage, (b) surface measurement, (c) volume measurement, (d) heat measurement; (e) rules for working with fractions and decimals.

   Answer _____

9 Imagine that you are teaching subject matter that has the characteristics of. (a) contains models and examples that illustrate abstractions or concepts, (b) contains abstractions that provide more complete understanding of the content, and (c) can be illustrated by demonstration. What type of sequencing of material would be most appropriate?

Answer _____

10 Read the following scenario Diagnose the problem associated with smooth transitions and suggest a reasonable remedy

Timothy Michael, a related instructor for science and materials in a sheet metal apprenticeship program was careful to vary his methods of presentation of material with each lesson. Further, Michael always closed his lessons by summarizing the major points and citing examples. However, Michael still found the apprentices to be restless and inattentive Therefore, he tried writing out and posting a schedule for each class and found that it helped a great deal, but did not completely eliminate his problem. What else would you suggest he try?

Answer: _____

Answers To Posttest

1. It is a yes/no type question with only a single, factual answer. Also, the question is somewhat ambiguous.

2. The question is in the interrogative style, is clear and is stated simply and directly.

3. The general steps in problem solving are:

    a) identify and discuss the problem and its component parts;

    b) consider possible strategies for solving the problem;

    c) select a strategy to use and secure necessary information, equipment, parts, tools and so forth; and

    d) solve and check problem.

4. A

5. A number of problems exist including. (a) letting folks know you believe they will fail, (b) basing evaluation on class norms rather than objective standards, (c) not making known the intent of instruction, (d) providing no feedback; (e) forcing folks to perform activity on which they will fail.

6. F

7. (a) information and (b) reward

8. Simple to complex

9. Concrete to abstract

10. He should carefully provide complete instructions and use various attention-getting strategies.

Scoring—Count questions 1, 2, 3, 4, 6, 8, 9 and 10 as one point each. Count questions 5 and 7 as two points each, one point for each correct answer. You must score at least 8 of the 12 possible points to complete successfully your work in this module.