DOCUMENT RESUME

ED 250 531 CE 040 066

TITLE Demonstrate a Concept or Principle. Second Edition. Module C-17 of Category C--Instructional Execution. Professional Teacher Education Module Series.
INSTITUTION Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY Department of Education, Washington, DC.
REPORT NO ISBN-0-89606-203-1
PUB DATE 85
NOTE 56p.; For related documents, see ED 246 306, ED 245 075-077, and ED 249 373.
AVAILABLE FROM American Association for Vocational Instructional Materials, 120 Driftmier Engineering Center, University of Georgia, Athens, GA 30602.
PUB TYPE Guides - Classroom Use - Materials (For Learner) (051)

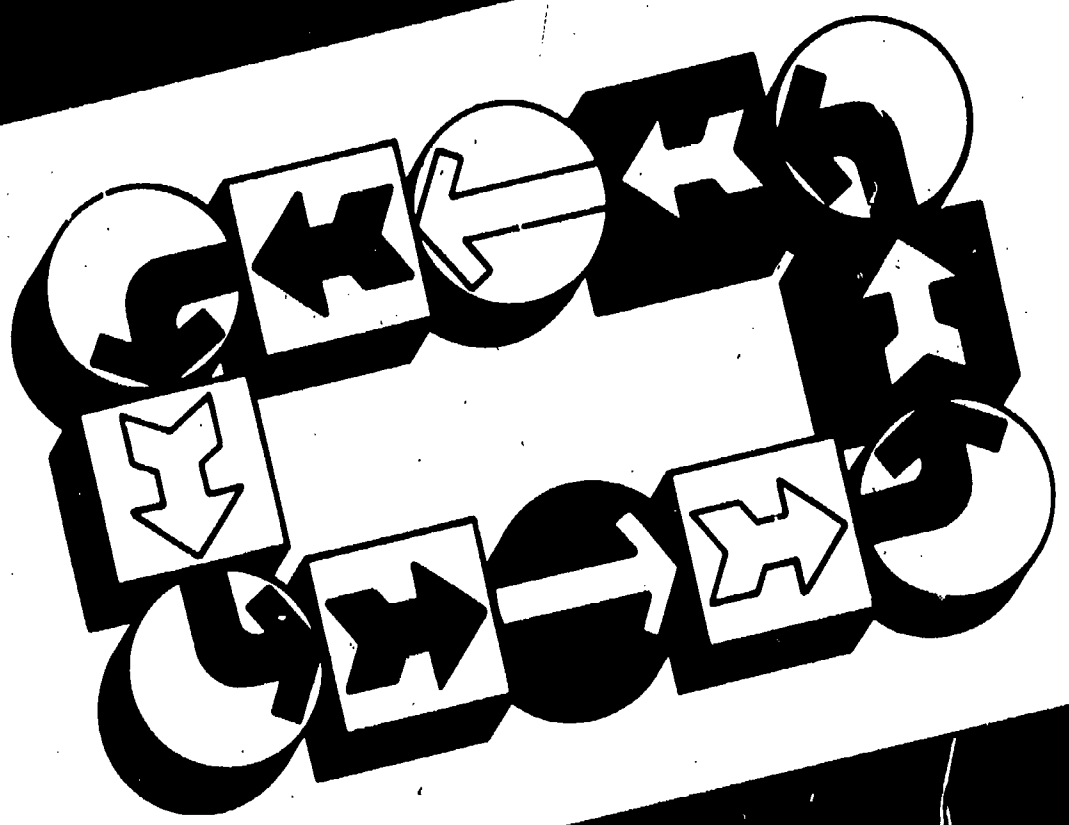
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Case Studies; Check Lists; *Competency Based Teacher Education; *Concept Teaching; *Demonstrations (Educational); Higher Education; Individualized Instruction; Job Skills; Learning Activities; Learning Modules; Teacher Evaluation; Teaching Methods; *Teaching Skills; Vocational Education; *Vocational Education Teachers

ABSTRACT

This module, one in a series of performance-based teacher education learning packages, focuses on a specific skill that vocational educators need to be successful in the area of instructional execution. The purpose of the module is to help the vocational-technical teacher develop competency in the technique of demonstrating a concept or principle. Introductory material provides terminal and enabling objectives, prerequisites, a list of resources, and general information. The main portion of the module includes three learning experiences based on the enabling objectives. Each learning experience presents learning activities with information sheets; samples; self checks and model answers to self checks; case scripts, critique forms, and model critique forms; and/or checklists. Optional activities are provided. Completion of these three learning experiences should lead to achievement of the terminal objective through the fourth and final learning experience that provides for a teacher performance assessment by a resource person. An assessment form is included. (YLB)

Demonstrate a Concept or Principle

Second Edition



AMERICAN ASSOCIATION FOR VOCATIONAL INSTRUCTIONAL MATERIALS
The University of Georgia
120 Driftmier Engineering Center : Athens GA 30602

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD : COLUMBUS, OHIO 43210

FOREWORD

This module is one of a series of 127 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of vocational teachers. The competencies upon which these modules are based were identified and verified through research as being important to successful vocational teaching at both the secondary and postsecondary levels of instruction. The modules are suitable for the preparation of teachers and other occupational trainers in all occupational areas.

Each module provides learning experiences that integrate theory and application; each culminates with criterion-referenced assessment of the teacher's (instructor's, trainer's) performance of the specified competency. The materials are designed for use by teachers-in-training working individually or in groups under the direction and with the assistance of teacher educators or others acting as resource persons. Resource persons should be skilled in the teacher competencies being developed and should be thoroughly oriented to PBTE concepts and procedures before using these materials.

The design of the materials provides considerable flexibility for planning and conducting performance-based training programs for preservice and inservice teachers, as well as business-industry-labor trainers, to meet a wide variety of individual needs and interests. The materials are intended for use by universities and colleges, state departments of education, postsecondary institutions, local education agencies, and others responsible for the professional development of vocational teachers and other occupational trainers.

The PBTE curriculum packages in Categories A – J are products of a sustained research and development effort by the National Center's Program for Professional Development for Vocational Education. Many individuals, institutions, and agencies participated with the National Center and have made contributions to the systematic development, testing, revision, and refinement of these very significant training materials. Calvin J. Cotrell directed the vocational teacher competency research study upon which these modules are based and also directed the curriculum development effort from 1971 – 1972. Curtis R. Finch provided leadership for the program from 1972 – 1974. Over 40 teacher educators provided input in development of initial versions of the modules; over 2,000 teachers and 300 resource persons in 20 universities, colleges, and postsecondary institutions used the materials and provided feedback to the National Center for revisions and refinement.

Early versions of the materials were developed by the National Center in cooperation with the vocational teacher education faculties at Oregon State University and at the University of Missouri – Columbia. Preliminary testing of the materials was conducted at Oregon State University, Temple University, and the University of Missouri – Columbia.

Following preliminary testing, major revision of all materials was performed by National Center staff, with the assistance of numerous consultants and visiting scholars from throughout the country.

Advanced testing of the materials was carried out with assistance of the vocational teacher educators and students of Central Washington State College; Colorado State University; Ferris State College, Michigan; Florida State University; Holland College, P.E.I., Canada; Oklahoma State University; Rutgers University, New Jersey; State University College at Buffalo, New York; Temple University, Pennsylvania; University of Arizona; University of Michigan–Flint; University of Minnesota–Twin Cities; University of Nebraska–Lincoln; University of Northern Colorado; University of Pittsburgh, Pennsylvania; University of Tennessee; University of Vermont; and Utah State University.

The first published edition of the modules found widespread use nationwide and in many other countries of the world. User feedback from such extensive use, as well as the passage of time, called for the updating of the content, resources, and illustrations of the original materials. Furthermore, three new categories (K–M) have been added to the series, covering the areas of serving students with special/exceptional needs, improving students' basic and personal skills, and implementing competency-based education. This addition required the articulation of content among the original modules and those of the new categories.

Recognition is extended to the following individuals for their roles in the revision of the original materials: Lois G. Harrington, Catherine C. King-Fitch and Michael E. Wonacott, Program Associates, for revision of content and resources; Cheryl M. Lowry, Research Specialist, for illustration specifications; and Barbara Shea for art work. Special recognition is extended to the staff at AAVIM for their invaluable contributions to the quality of the final printed products, particularly to Donna Pritchett for module layout, design, and final art work, and to George W. Smith Jr. for supervision of the module production process.

Robert E. Taylor
Executive Director
The National Center for Research in Vocational Education

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS OHIO 43210

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research.
- Developing educational programs and products.
- Evaluating individual program needs and outcomes.
- Providing information for national planning and policy.
- Installing educational programs and products.
- Operating information systems and services.
- Conducting leadership development and training programs.

AAVIM
AMERICAN ASSOCIATION FOR VOCATIONAL INSTRUCTIONAL MATERIALS
The National Institute for Instructional Materials
120 Driftmier Engineering Center
Athens, Georgia 30602

The American Association for Vocational Instructional Materials (AAVIM) is a nonprofit national institute.

The institute is a cooperative effort of universities, colleges and divisions of vocational and technical education in the United States and Canada to provide for excellence in instructional materials.

Direction is given by a representative from each of the states, provinces and territories. AAVIM also works closely with teacher organizations, government agencies and industry.

MODULE

C-17

Demonstrate a Concept or Principle

Second Edition

Module C-17 of Category C—Instructional Execution
PROFESSIONAL TEACHER EDUCATION MODULE SERIES

The National Center for Research in Vocational Education
The Ohio State University

Key Program Staff:
James B. Hamilton, Program Director
Robert E. Norton, Associate Program Director
Glen E. Fardig, Specialist
Lois G. Harrington, Program Assistant
Karen M. Quinn, Program Assistant

1985

ISBN 0-89606-203-1

Published and distributed by the **American Association for Vocational Instructional Materials (AAVIM)**, 120 Driftmier Engineering Center, The University of Georgia, Athens, Georgia 30602, (404) 542-2586.

INTRODUCTION

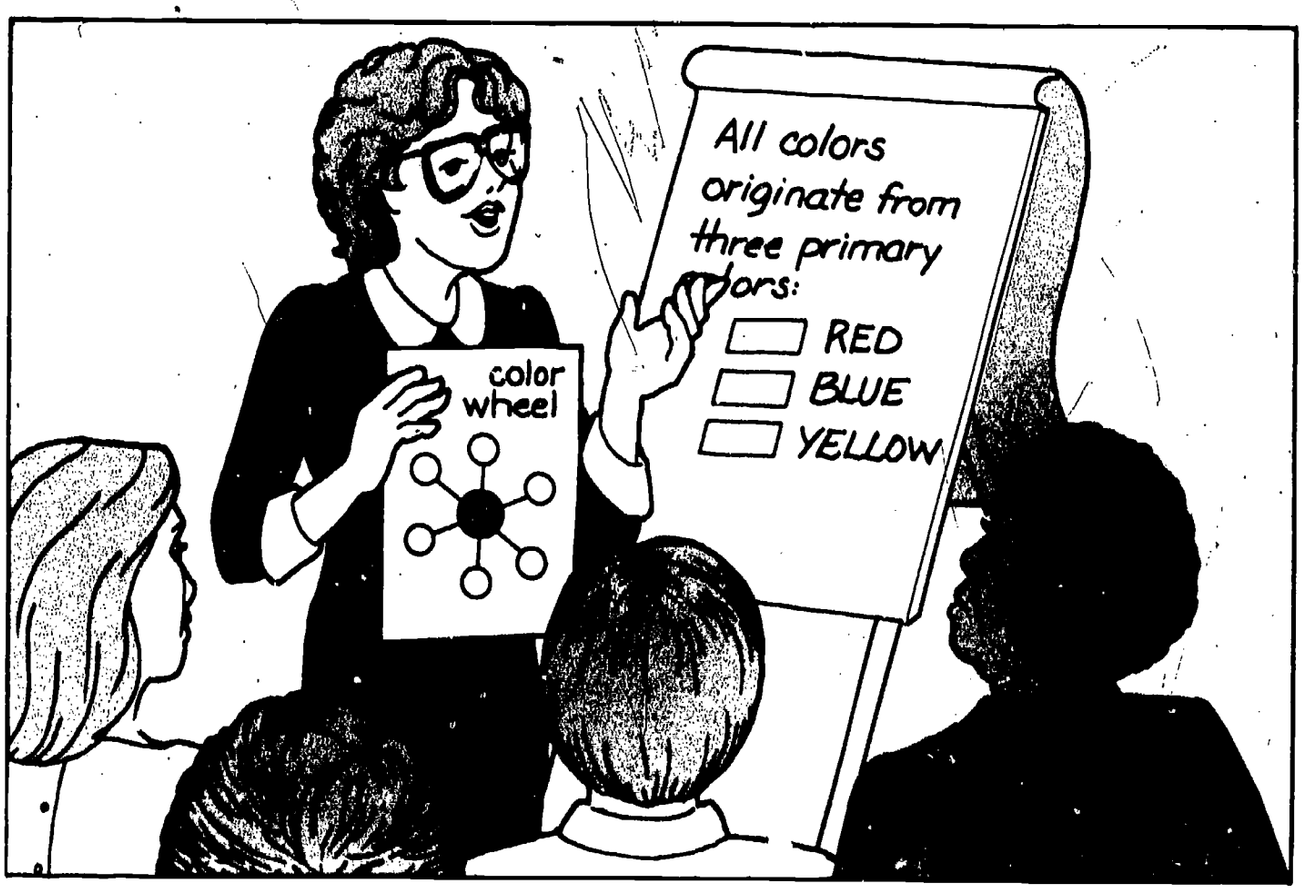
A demonstration is an invaluable aid in teaching a **skill.** The simple request, "Show me how to do that," calls for such a demonstration. In the laboratory, the vocational-technical teacher uses demonstrations to teach various skills—from milking a cow to making a buttonhole. The purpose of demonstrating a skill is to teach students how to perform a task in a given way, i.e., to repeat the identical demonstration themselves.

The purpose of demonstrating a **concept** or **principle,** on the other hand, is not to teach students how to perform an operation in a particular way. Rather, it is used to teach students why something works the way it does, i.e., to demonstrate a basic truth about something. In a concept/principle demonstration, the instructor's aim is to lead students to a basic understanding that can be applied to many different situations.

When you teach a student **how** to bake a cake at 400°, you have taught a skill. When you teach a student **why** a cake rises when subjected to the heat in the oven, you have taught a concept. Obviously, a student can bake a cake without knowing the specific reactions involving yeast or baking powder that cause bread or cake to rise. However, understanding such concepts is an important part of occupational preparation.

In every vocational service area, there are concepts and principles that are essential to a student's full mastery of an occupation. A carpenter must understand what a board foot is. A dietician must understand how calcium is assimilated. An interior decorator must understand balance in form and color.

There are many concepts that you, as a teacher, will need to present to your students. This module is designed to help you develop competency in the technique of demonstrating a concept or principle.



ABOUT THIS MODULE

Objectives

Terminal Objective: In an actual teaching situation, demonstrate a concept or principle. Your performance will be assessed by your resource person, using the Teacher Performance Assessment Form, p. 51 (*Learning Experience IV*).

Enabling Objectives:

1. After completing the required reading, demonstrate knowledge of the important considerations involved in demonstrating a concept or principle (*Learning Experience I*).
2. Given a case script of a teacher demonstrating a principle, critique the performance of that teacher (*Learning Experience II*).
3. In a simulated classroom or laboratory situation, demonstrate a concept or principle (*Learning Experience III*).

Prerequisites

To complete this module, you must have competency in developing a lesson plan. If you do not already have this competency, meet with your resource person to determine what method you will use to gain this skill. One option is to complete the information and practice activities in the following module:

- *Develop a Lesson Plan*, Module B–4

Resources

A list of the outside resources that supplement those contained within the module follows. Check with your resource person (1) to determine the availability and the location of these resources, (2) to locate additional references in your occupational specialty, and (3) to get assistance in setting up activities with peers or observations of skilled teachers, if necessary. Your resource person may also be contacted if you have any difficulty with directions or in assessing your progress at any time.

Learning Experience I

No outside resources

Learning Experience II

Optional

A locally produced videotape of a teacher demonstrating a concept or principle that you can view for the purpose of critiquing that teacher's performance.

Videotape equipment to use in viewing a videotaped presentation.

Learning Experience III

Required

2–5 peers to role-play students to whom you are demonstrating a concept or principle and to critique your performance. If peers are unavailable, you may present your lesson to your *resource person*.

Optional

A resource person to review the adequacy of your demonstration plan.

Videotape equipment to use in taping, viewing, and self-evaluating your demonstration.

Learning Experience IV

Required

An actual teaching situation in which you can demonstrate a concept or principle.

A resource person to assess your competency in demonstrating a concept or principle.

General Information

For information about the general organization of each performance-based teacher education (PBTE) module, general procedures for its use, and terminology that is common to all the modules, see About Using the National Center's PBTE Modules on the inside back cover. For more in-depth information on how to use the modules in teacher/trainer education programs, you may wish to refer to three related documents:

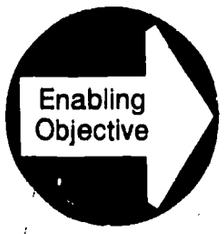
The *Student Guide to Using Performance-Based Teacher Education Materials* is designed to help orient preservice and inservice teachers and occupational trainers to PBTE in general and to the PBTE materials.

The *Resource Person Guide to Using Performance-Based Teacher Education Materials* can help prospective resource persons to guide and assist preservice and inservice teachers and occupational trainers in the development of professional teaching competencies through use of the PBTE modules. It also includes lists of all the module competencies, as well as a listing of the supplementary resources and the addresses where they can be obtained.

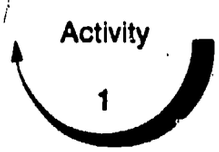
The *Guide to the Implementation of Performance-Based Teacher Education* is designed to help those who will administer the PBTE program. It contains answers to implementation questions, possible solutions to problems, and alternative courses of action.

Learning Experience I

OVERVIEW

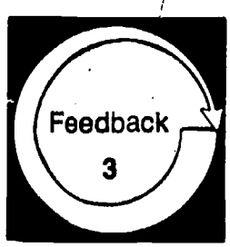


After completing the required reading, demonstrate knowledge of the important considerations involved in demonstrating a concept or principle.



You will be reading the information sheet, Demonstrating Concepts and Principles, pp. 6–12.

You will be demonstrating knowledge of the important considerations involved in demonstrating a concept or principle by completing the Self-Check, pp. 13–16.

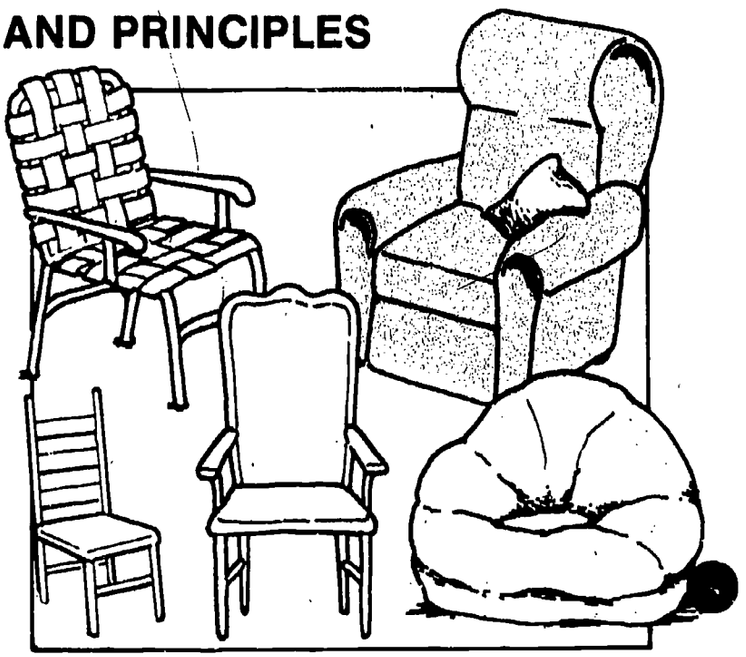


You will be evaluating your competency by comparing your completed Self-Check with the Model Answers, p. 17.

Activity 1

Concepts and principles are the building blocks of knowledge. They are tools that allow us to think. However, in many ways they are difficult to analyze and to explain to others. The following information sheet examines the basic question, "What are concepts and principles?" Several general techniques for teaching concepts and principles are discussed. Specific techniques for using the demonstration method to present concepts or principles are outlined. To gain knowledge of these elements, read the following information sheet.

DEMONSTRATING CONCEPTS AND PRINCIPLES



If you wanted to teach students how to wire a plug, you would probably demonstrate the procedure for them first. You could then have the students perform the steps they observed. With a **skill** demonstration, you want students to be able to perform that same skill themselves.

Demonstrations have instructional uses other than explaining how to do something, however. A demonstration is a visual explanation of an important fact, idea, or process. Thus, it can also be used to help students understand a concept (e.g., the flow of electricity) or a principle (e.g., "the rate of current flow is always equal to the voltage divided by the resistance"). When you demonstrate a **concept** or **principle,** you do not want students to be able to repeat your performance; you want them to understand the concept or principle underlying the performance.

What are concepts and principles? When should they be demonstrated? How can you plan a successful demonstration of a concept or principle?

Concepts and Principles

A concept is an **idea** existing only in one's mind, but associated with an experience. Every concept, even the most abstract, has something to which it refers (a referent). The concept *one* is learned through experiences with one book, one ice cream cone, one toy. In other words, it is learned through experiences with **things.**

If you close your eyes and think of a chair, you probably get a mental image of something with a seat and a back that one person can sit on. The concept of a *chair* includes the essential characteristics of each specific type of chair—folding chair, recliner, armchair, or beanbag chair. The **referent** is **a particular chair in the real world.** The **concept** of that referent is **a set of general characteristics that defines all chairs.**

When concepts are first mentally formed, they are vague and inexact because there are few referents to define them. As additional experiences are gained, details are added that fill out the concept and define it more accurately. For instance, a concept of *a bird* that is based on experiences with only robins and finches may be "a creature that flies and has feathers, two wings, a bill, two legs," and so on. However, this concept will have to be modified after an additional experience with an ostrich, which does not fly.

Concepts that refer to tangible objects (objects that can be touched such as chairs, birds, places, and people) are called **concrete concepts.** There are also concepts that do not refer to tangible objects, but to processes, qualities, and relationships. These are called **abstract concepts.**

The abstract concept of *work*, for example, refers to a **process** of exchanging labor for something else, usually money. There is no tangible object that represents work. You cannot point to "a work," but you have a concept of it nevertheless.

Similarly, the abstract concept of *viscosity* refers to a **quality** of thickness in liquids that makes them hard to pour. Molasses is more viscous than water, but there is no such thing as "a viscous." Viscosity is a mental concept that exists apart from either water or molasses.

The abstract concept of *sibling* refers to a **relationship** between people who have the same parents. The concept of *evaporation* refers to a relationship between one physical state (liquid) and another (gaseous). A concept involving a relationship depends on understanding two or more concepts. The flow of electricity, for instance, is a concept involving two other concepts—potential and resistance.

When a concept refers to a **constant relationship that can be used to make predictions,** it is called a **principle,** or **law.** Ohm's law is an example of a principle because it defines a constant relationship; i.e., "the amount of steady current through a material is proportional to the voltage across the material" (V/I = R).

Demonstration Methods

Concepts are a means of organizing various random experiences. Thus, they allow us to (1) classify experiences according to their similarities and differences, (2) make comparisons, and (3) judge and decide between alternatives. In short, concepts allow us to think. Knowledge consists of systematic sets of concepts that are built up gradually, from simple to complex. Since education involves imparting knowledge, the teaching of concepts is a fundamental part of your role as a teacher.

However, perceptions are individual and personal, and concepts based on these perceptions must be individual as well. Therefore, a concept cannot be simply passed on from instructor to student. Each student must discover for him/herself how a concept applies to his or her own experiences and how it may be used to organize these experiences. Your role is to direct students' attention to previous experiences or to furnish firsthand experiences that demonstrate the concept.

In many instances, the teaching of a concept is simply a matter of reminding students of what they already know but have not yet organized in a meaningful way. Most students have observed how slowly molasses or honey pours from a jar. However, they may not have understood why.

It may be enough to mention these previous experiences in explaining the concept of viscosity. If you illustrate the concept by drawing on students' previous experiences, the referent might be **a statement** such as "Have you ever poured honey or molasses from a jar? Did you notice how slowly it poured?"

However, students will not always have had previous experiences to which you can direct their attention in explaining a concept. In some cases, you will have to provide a real example or realistic illustration of the concept.

The law of economies of scale (or mass production) states that "as the size of a manufacturing plant increases, a number of considerations give rise, for a time, to lower average costs of production." This law may make little sense to students who have had limited or no experience in managing a business. These students would need a concrete example of how this law works.

Assume that your classroom has 1 teacher and 14 students, yet it has desks, supplies, and space for 25 students. You could demonstrate the law of economies of scale by inviting 11 additional "students" in to fill the desks. You could then announce to the class, "We will have 11 new class members from now on, which is a real money maker for the school." (That ought to get their attention.)

You could then lead a discussion concerning why having the additional students is a "real money maker" (i.e., for each student, the school gets X number of dollars, yet because you have the desks, supplies, and a teacher already, there are no additional costs).

A little later in the class period, five more "students" could join the class. They would have to stand and to share materials. You could then lead a discussion concerning what happens when you exceed certain limits (i.e., you need more desks, more space, and perhaps another teacher or a teacher's aide; thus, you have added costs as well as income). If you demonstrate the law in this way, **the real experience** is the referent.

It is important to present the statement of the referent, or the concrete example of the concept, at the same time that you present the statement of the concept. If you attempt to teach the law of economies of scale by merely stating the law, students may be tempted to memorize the concept before they understand it. Being able to repeat your words does not necessarily mean that the student has really understood the concept.

The evidence for determining if a student has really understood comes from whether the student can **apply** the concept. You can simplify the transfer of learning by (1) presenting students with new situations in addition to the original learning situation and (2) allowing the student to generalize the concept. Just providing students with more situations will not help them to build generalizations. The new situations should be varied so that the element of likeness common to each can be distinguished from the situation itself.

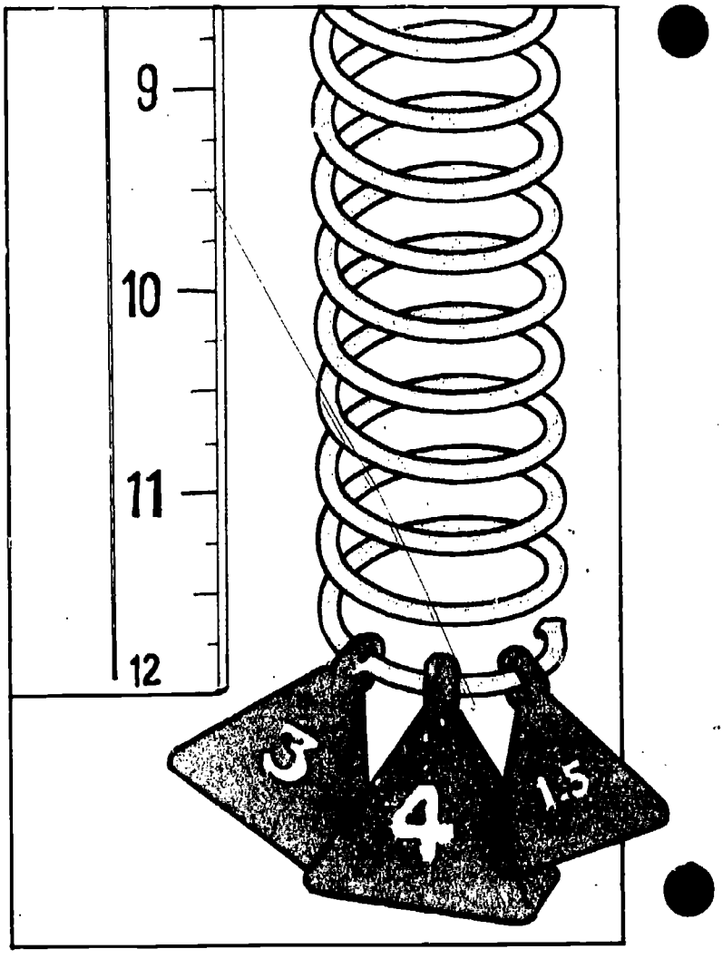
In teaching students the concept of sheathing in plants, for instance, you might compare sheaths in corn with sheaths in grass to illustrate the **similarity** of the concept from one situation to another. In explaining the function of protein in human diet, you might first describe human needs for essential amino acids. You could then contrast this with the needs of animals that can synthesize those amino acids, pointing out the **difference** between the two situations.

Another method of teaching concepts is to pose questions that will motivate students to discuss the concept after it has been presented. In the process of discussing, they can put the concept into their own words and compare their ideas with others' ideas to verify them.

In helping students come to grips with the principles underlying your occupational area, there are two basic methods that you may use. One method is to **state the principle** first and then to **offer concrete examples** of it.

For example, you might first state the principle that "when air is compressed, its temperature increases; when air expands, its temperature decreases." You could then illustrate the principle by having students compare the temperature of compressed air used to inflate a tire with the temperature of air released from the tire valve. Or, you could have students observe the temperature differential created by compressed and expanding fluids in a refrigeration system.

Another method of presenting a principle is called the **discovery technique.** Using this technique, students are first given examples and then gradually led to formulate a statement of the principle.



In other words, students are led to "discover" the principle for themselves. For example, students could be led to discover Hooke's law ("stress is proportional to strain within the limits of elasticity") by first recording the increase in the length of a suspended spring as additional weights are attached to it.

They could then evaluate the results and determine by themselves that the increase in length is proportional to the increase in weight. At that point, you could state the law in words: "Strain is directly proportional to stress." The discovery technique has the advantage of providing an element of excitement at the point at which disorganized perceptions suddenly become meaningfully arranged by an organizing principle.

These methods require the use of concrete examples—either verbal examples or real demonstrations of the concept or principle. You will need to decide which method will be more effective. Your decision will depend on the particular concept or principle involved and the particular students being taught. If the demonstration method is chosen, however, there are some special considerations that need to be made in planning the demonstration.

In the first place, the concept/principle should be capable of being illustrated through a demonstration. Some concepts and principles do not lend themselves to demonstration. For example, the concept of *markup* in merchandising might be simpler to teach through a problem-solving method than through a demonstration.

The students' previous instruction and real-world experiences are also important in determining whether a particular concept/principle should be demonstrated. If a student has already had firsthand experiences with the concept, you may only need to refer to these in order to teach the concept. In that case, providing new experiences through a demonstration may not be necessary.

The Demonstration Plan

If a demonstration is necessary, advance planning is essential. Planning should include the following steps:

- Summarize the concept or principle to be demonstrated in a few words. If you have difficulty doing this, it may be because you do not have a clear understanding of the concept or principle yourself. Reading about the concept/principle or talking your ideas over with peers may help you increase your own understanding.
- Identify a specific example of the concept or principle that can be easily demonstrated. Remember, every concept or principle has a referent. However, if you cannot think of a good example, perhaps a demonstration is not the best way to teach the concept or principle.
- List the steps to be followed during the demonstration, in their correct order.
- List the key points to be emphasized during the demonstration.
- List all materials and equipment needed for the demonstration.
- List any visual aids, such as graphs, transparencies, drawings, and models, that are needed to present the concept or principle.
- Plan how to introduce the demonstration. The introduction should (1) relate the new concept or principle to the students' previous knowledge or experience, (2) arouse curiosity, (3) give background information, and (4) define new terms.

Once your plans are complete, you will need to make the preparations for the demonstration. The following steps should be completed:

- Prepare the visual aids listed in your plan.
- Assemble all necessary materials and equipment.
- Prepare the physical setting in which you will conduct the demonstration so that each student will be able to see and hear comfortably.
- Practice or rehearse the presentation.

When you conduct the demonstration, you should perform the steps, giving a simple explanation for each step as you proceed. Observe students throughout to make sure your pace isn't too fast or too slow. Then, summarize the demonstration or let students summarize it. This can be done either as you proceed through the demonstration or immediately afterwards.

After your demonstration, you need to conduct certain follow-up activities. First, review key points with the class. If a significant number of students missed or misunderstood any key points, you may need to repeat the demonstration. Then, have students apply the concept or principle in a new situation so they can generalize their learning.

Sample 1 is designed to show you how a completed demonstration plan looks when the correct procedures are followed. Keep in mind that this is **not** a plan for a total lesson; a demonstration may be only part of the lesson. The total lesson plan would have to include the stated objective, an introduction covering the **whole** lesson, other activities necessary for attaining the objective, a summary covering the whole lesson, and an evaluation method.

SAMPLE 1

CONCEPT/PRINCIPLE DEMONSTRATION PLAN

CONCEPT/PRINCIPLE TO BE DEMONSTRATED: Board Feet

SUMMARY OF CONCEPT/PRINCIPLE: A board foot is the unit of volume measure for wood; i.e., a piece of wood one foot long, by one foot wide, by one inch thick.

INTRODUCTION METHOD: "Things we buy and sell are measured in many different amounts or units: by the piece (e.g., a car or shovel), by a set number of pieces (e.g., a dozen eggs), by length (e.g., a foot of electrical wire or copper pipe), by area (e.g., a square yard of material), or by volume (e.g., a quart of milk or a gallon of paint)."

"Today, we are going to order lumber, which is sold in volume units called board feet. In order to know how much wood to buy and what the cost will be, we need to know what a board foot is and how it can be calculated."

TERMS:

1. volume—space occupied, as measured in cubic units; i.e., length, width, and thickness
2. foot—a linear measure equivalent to 12 inches or 1/3 yard
3. inch—a linear measure equivalent to 1/12th foot or 1/36 yard
4. board foot—equal to the volume of wood measuring one foot long, one foot wide, and one inch thick

STEPS TO BE FOLLOWED:

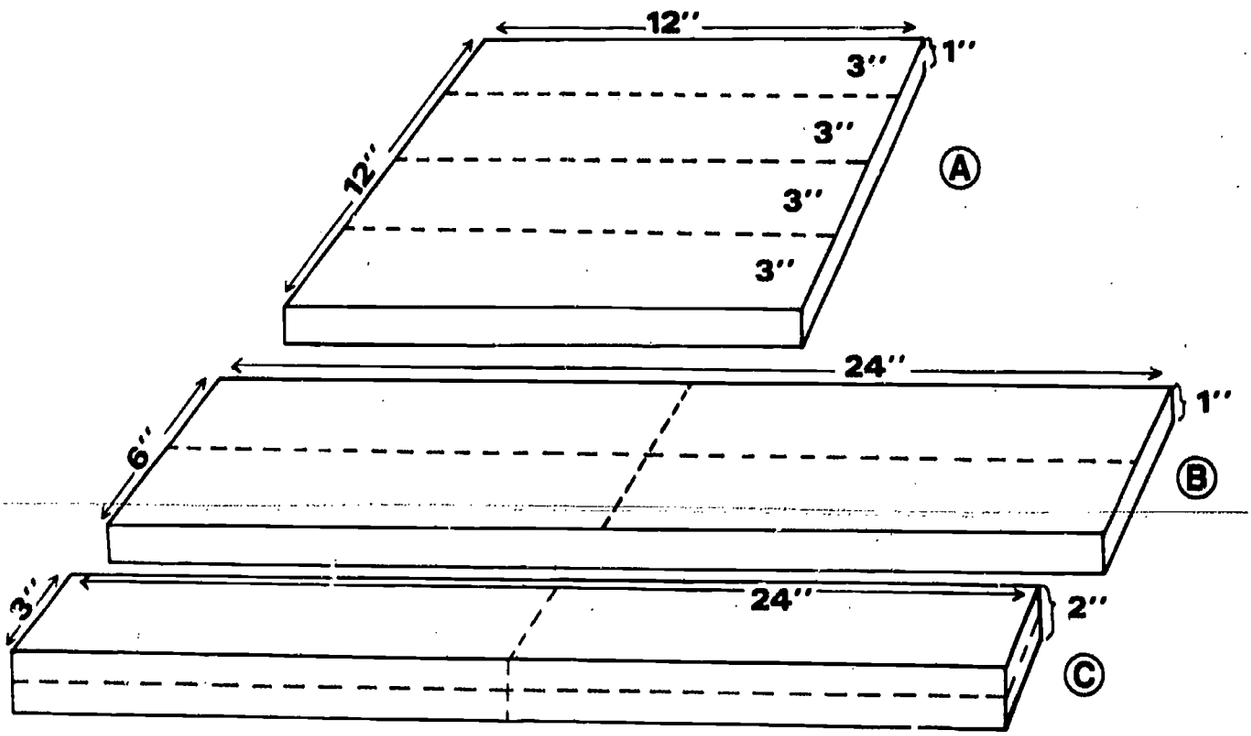
1. Display the wood visual before the class with the four pieces joined to measure up to 1' x 1' × 1" (see Graphic A)
2. Define a board foot orally
3. Display a quart of milk in a square carton
4. Pour the quart of milk into a round quart jar ("The shape of the container does not determine the volume")
5. "A board foot, like milk, can also come in different shapes"

6. Display the wood visual and rejoin it to measure 2′ × 6″ × 1″ (see Graphic B)

7. Rejoin wood visual to measure 2′ × 3″ × 2″ (see Graphic C)

8. Write formula for calculating board feet on the chalkboard, and calculate the board feet in the wood visual for each of the three shapes shown previously (the answer should be one board foot in all instances)

9. Summarize by defining a board foot and restating the formula for calculating board feet



A board foot can come in different shapes.

KEY POINTS TO BE EMPHASIZED:

1. A board foot is the volume of wood equal to one foot long, one foot wide, and one inch thick
2. A board foot can come in different shapes
3. The formula for calculating board feet is "length in feet" times "width in inches" times "thickness in inches" divided by 12
4. Knowing how to define and calculate board feet is necessary for buying and selling lumber

MATERIALS, EQUIPMENT, AND VISUAL AIDS NEEDED:

1. Four pieces of wood, each measuring 1' x 3" x 1", that are doweled such that they can be joined side by side, end to end, and/or stacked one on top of another
2. A quart of milk in a square carton
3. A round quart milk bottle

SUMMARY AND/OR FEEDBACK METHOD:

1. Oral summary by teacher with input from students
2. Feedback based on student responses to application situation and their calculation of board feet

NEW APPLICATION SITUATION: Students calculate the board feet, using the formula given, for several different sized pieces of lumber commonly sold in the local area.

The following items check your comprehension of the material in the information sheet, Demonstrating Concepts and Principles, pp. 6–12. Each of the nine items requires a short essay-type response. Please explain fully, but briefly.

SELF-CHECK

1. What is a concept?

2. What is a principle?

3. How do you know whether a student has understood the concept or principle being taught?

4. If concepts are individual and personal, how can one person teach another person a concept?

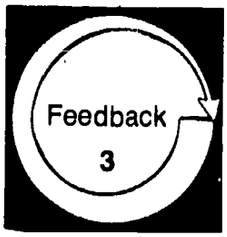
5. *To generalize* refers to the ability to recognize or apply the concept in a situation other than the original learning situation. How can you improve a student's ability to generalize?

6. How is the discovery technique used in teaching principles?

7. If you decide to demonstrate a concept and then discover you can't think of any examples of the concept, what should you conclude?

8. In teaching a concept, how would you decide whether to **demonstrate** the concept or to **refer to** students' previous experiences?

9. What are some ways to make a demonstration easier to observe?



Compare your written responses to the self-check items with the model answers given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same **major** points.

MODEL ANSWERS

1. A concept is a mental construct—an idea—that refers to an experience. If it refers to a tangible object, it is called a concrete concept. If it refers to a process, a quality, or a relationship, it is called an abstract concept.
2. A principle refers to a constant relationship between two or more concepts that can be used to make predictions.
3. To determine if students have understood the concept or principle, have them try to apply it to a new learning situation. Mere memorization of the teacher's words does not demonstrate understanding.
4. To teach a concept, you can provide students with experiences that illustrate the concept and help students organize these experiences. If students have already had firsthand experiences with the concept but have not organized them in a coherent way, you can refer to these experiences and explain them in terms of the concept they illustrate.
5. To help students learn to generalize, you can present the concept in a variety of situations so that students will be able to separate the concept from the particular situation that illustrates it. However, the same situation should not be presented many times. Different situations should be used—either similar to or different from the original learning situation—to allow students to compare and contrast the way in which the concept applies to each.

   Another method that facilitates students' ability to generalize is to pose questions that encourage them to verbalize the concept. In the process of explaining their versions of the concept to others, students will clarify their own understanding. In addition, by putting the concept into their own words, students must draw on their personal experiences and, in so doing, will have generalized the concept from the original learning situation to a new situation.
6. Using the discovery technique, you present examples of a principle and encourage students to offer explanations until gradually students are led to discover the underlying principle.
7. If you have difficulty thinking of an example of a concept, it may be because you do not really understand the concept. Every concept, even the most abstract, has a referent. However, not every concept can be demonstrated in the classroom. Some concepts can be taught best by demonstration; others are simpler to teach using another method.
8. Often, a student has had many firsthand experiences with a concept but has not organized them in terms of a concept. In that case, it may be enough to remind the student of these experiences and to direct his/her attention to them as you explain how they illustrate the concept.

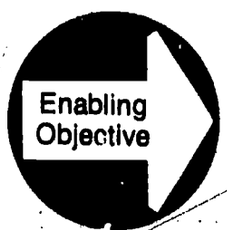
   For example, assume you are trying to teach the concept of air as an insulator. If all students have had previous experiences with wool socks and cotton socks, you could simply refer to the fact that wool socks are warmer than cotton socks and explain why. But if students have not had firsthand experiences with the concept, you may need to present a real example of the concept through a demonstration.
9. If students are not able to see each step of the demonstration, you could divide the class into small groups and repeat the demonstration for each group. Another method is to prepare visual aids—transparencies, graphs, drawings—ahead of time and use them to illustrate the steps that are difficult to view.

Level of Performance: Your written responses to the self-check items should have covered the same **major** points as the model answers. If you missed some points or have questions about any additional points you made, review the material in the information sheet, Demonstrating Concepts and Principles, pp. 6–12, or check with your resource person if necessary.

NOTES

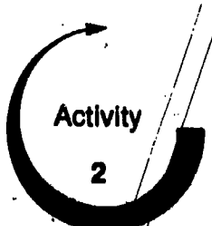
Learning Experience II

OVERVIEW

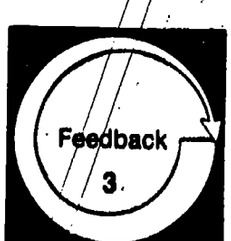


Given a case script of a teacher demonstrating a principle, critique the performance of that teacher.

You will be reading the Case Script, pp. 20–22.



You will be critiquing the performance of the teacher described in the Case Script, using the Critique Form, pp. 23–26.



You will be evaluating your competency in critiquing the teacher's performance in demonstrating a principle by comparing your completed critique with the Model Critique, p. 27.

You may wish to view a locally produced videotape of a teacher demonstrating a concept or principle and to critique that teacher's performance.

The following case script describes how Mr. Martino, a vocational teacher, demonstrated the principle of supply and demand to his students. With the criteria for presenting an effective concept/principle demonstration in mind, read the situation described.

CASE SCRIPT

Mr. Martino is sitting at his desk, wiping his forehead with a handkerchief.

Mr. Martino:

This heat is terrible. It's almost too hot to hold class.

The students indicate that they more than agree with that statement.

It's hot enough to fry an egg on the sidewalk. I'll bet you'd rather be drinking a can of lemonade instead of frying eggs.

Jeff:

I could go for something cold to drink. I like your idea about not holding class even better.

Mr. Martino:

I'm afraid you're stuck, Jeff . . . but back to the lemonade. I have a can right here I'd be willing to part with . . . for the right price. Which of you is interested in cooling off for, say, a dollar?

Sam:

A dollar? Give us a break. If that's the only one you have, I'll give you 50 cents for it. All that talk about the heat made me thirsty.

Mr. Martino:

This is the only one I have. I emptied the machine in the teachers' lounge. Ninety cents is as low as I'll go.

Sam:

I'll give you 80.

Mr. Martino:

Well, okay. Sold. Come and get your ice cold lemonade.

Fred:

I'd part with 80 cents, too, for something to drink right now.

Mr. Martino:

I should admit that I do have two. That seems a fair price, Fred. My last one is yours.

Maude:

The rest of us are going to melt. Susan and I would have bought that, but all we could scrape together was 60 cents. It's so hot!

Mr. Martino:

I think I can come up with one more before you melt. You win. You know, I did bring one for myself. I sure hate to see the rest of you go thirsty. . . .

As Mr. Martino continues to produce cans of lemonade, the students offer lower and lower prices. Juan buys another for 60 cents. Jeff offers him 20 cents if he can find just one more can.

Ben, would you pay more than Jeff offered me?

Ben:

Rats, Mr. Martino. All I've got is 20 cents. I sure could use a drink of something right now, though.

Mr. Martino:

It looks like no one's going to give me more than 20 cents. I'll give Jeff his drink for that, and there's one here for Ben, too. Pay up, boys! Paul, are you going to go thirsty? I can't let that happen. I suppose I can find another can for you. What would you be willing to pay?

Paul:

I'm the only customer you have left. I'll take it off your hands for a nickel.

Mr. Martino:

A nickel it is Paul. Now you all have something cold to drink. I think you'll find, though, that you've gotten something better out of what has just happened . . . a lesson. Can anybody guess what that might have been?

There is a pause while the students consider that question.

Juan:

Leave it to a teacher to make a lesson out of everything. Was it something to do with our being thirsty and your having cold lemonade available?

Mr. Martino:

You've hit it right on the head, Juan. To put what you've said a little more formally, let's call it the law of supply and demand. Let's keep it simple, though. Let's discuss it in terms of what our demonstration showed us.

Mr. Martino gets up and moves to the side of the classroom.

First, let's start with some definitions. I need a volunteer to read the law while someone else puts it on the chalkboard.

Susan and Maude volunteer. Susan writes "The Law of Supply and Demand" on the board and Maude begins to read as Susan continues to write.

Maude:

The law of supply and demand says, "For each commodity, some price must exist that will cause the supply and demand for that commodity to be equal."

Jeff:

Whew, that's pretty heavy. What are all those things—like commodity and supply and demand?

Mr. Martino:

Who can help Jeff to understand those terms?

Paul:

Don't get all uptight, man. Commodity is just a fancy word for a product. Our commodity was the lemonade.

Ben:

If that's what a commodity is, I think I can figure out supply. Mr. Martino's supply was how many cans of lemonade he had.

Jeff:

Well, then, I can figure out demand on my own. Demand was what we had. We wanted those cans of lemonade.

Fred:

I'm not sure I really understand yet.

Mr. Martino:

Would you like to help put the results of our demonstration on graphs so that we can all see what happened?

Fred:

That sounds like a good idea, but I don't know if I can.

Mr. Martino:

Sure you can. The class will guide you. Since Jeff figured out what demand is, we'll let him plot what we'll call our demand curve. Fred can help us out with a supply curve.

Mr. Martino turns over a page on a flip chart at the front of the room to reveal three empty graphs.

Jeff:

What are these numbers on the left side of my graph?

Sam:

They're the prices we paid for the lemonade . . . and there's the 20 cents you paid and there's the 80 cents I paid.

Sam groans.

Jeff:

I see. These numbers at the bottom must represent the cans of lemonade Mr. Martino had. This is easy. The first soda sold for 80. I'll put an X here. The second one, too. This is really easy.

Jeff continues to fill in the graph.

Fred:

The supply curve isn't hard either.

Mr. Martino:

I knew you guys would help me out. Who can see what from the curves?

Maude:

The demand curve travels downward from the high prices to the low prices. But I don't see what that means.

Juan:

What would happen if we had more students and you had more lemonade, Mr. Martino?

Mr. Martino:

Who can answer Juan's question? Think about that, Maude.

Maude:

I can see that the curve would just keep traveling downward. I guess your supply would just be bigger than our demand for lemonade. Oh, I see what the curve shows.

Juan:

You helped me, too, Maude.

Mr. Martino:

Fred, can you explain your supply curve?

Fred:

Well, it travels upward. I think you said you had more lemonade because Sam and I paid you 80 cents. The other students didn't want to pay that much though. You increased your supply, but we decreased our demand. The prices went down.

Sam:

I can see these curves, but I don't see any price that causes the supply and demand to be equal like the law says.

Mr. Martino:

For that we need to see how the curves work together. Sam, why don't you come here and plot the curves together on this empty chart.

Sam goes to the flip chart and charts each curve on the empty chart.

Sam has plotted the curves together for us, and he has answered his own question. He has a point on his graph where the supply and demand curves meet. I call it the equilibrium point. Can anyone m that sound a little less frightening?

Susan:

When Maude read the law of supply and demand, it said that a price exists that will cause the supply and demand to be equal. Sam has that price there. You call it the equilibrium point. That just means the point where supply and demand are equal.

Fred:

Look what the point says: 40 cents. Just think, Sam and I paid 80 cents apiece for one lousy lemonade.

Paul:

I'm glad I only paid a nickel. That's a lot less than forty cents.

Sam:

Don't act so smart, Paul. Can you see what your paying a nickel and my paying 80 cents means?

Ben:

I can see that. Some people had to pay more than 40 and some people had to pay less to make that our equilibrium point.

Mr. Martino:

That's right. Since you've all helped teach your own lesson today, I'll give you your money back. The lemonade will be on me. Now, let's go over what we've learned once more.

Juan:

Well, you had lemonade and we wanted it, so we paid you a lot of money. You thought you could get a lot more money, so you came up with more lemonade.

Ben:

Yeah, but then our demand decreased.

Susan:

When they plotted the curves, we saw where our demand and your supply were equal—your equilibrium point—40 cents.

Mr. Martino:

Who can tell us just once more what the law of supply and demand says?

Susan:

Well, there has to be some price where supply and demand equal each other . . . like with our lemonade. Forty cents was the price. That's easy to see now.

Mr. Martino:

Thanks. Tonight see if you can think of other situations we can apply the law of supply and demand to. I have instruction sheets with the definitions we discussed, including the law of supply and demand, and with some blank graphs. Pick one up after class when you come up to claim your money and take them home tonight and look them over. We'll discuss them more tomorrow. Now, get out of here. It's too hot to hold class.

The bell rings and the students converge on Mr. Martino's desk for reimbursements and instruction sheets.

Below is a form with questions to guide you in preparing a written critique of Mr. Martino's competency in demonstrating a principle. Read each question and indicate, by circling the YES or NO, whether Mr. Martino accomplished each item. Briefly explain your responses in the space provided for comments below each item.

CRITIQUE FORM

1. Did Mr. Martino select an example of the principle that could be easily demonstrated? YES NO

   Comments:

2. Was the demonstration set up where it could be easily viewed by each student? YES NO

   Comments:

3. Did Mr. Martino relate the new principle to students' own experiences or previous instruction? YES NO

   Comments:

4. Did Mr. Martino define terms or give background information when necessary? YES NO

Comments:

5. Were all materials and equipment ready for use? YES NO

Comments:

6. Did Mr. Martino perform the steps of the demonstration in a logical order? YES NO

Comments:

7. Was there any evidence to indicate that Mr. Martino observed students to see that they were following the demonstration? YES NO

Comments:

8. Were key points summarized either during the demonstration or at the conclusion? YES NO

Comments:

9. Did Mr. Martino evaluate students' comprehension of the principle by giving a test, leading a discussion, or using some other means of getting feedback? YES NO

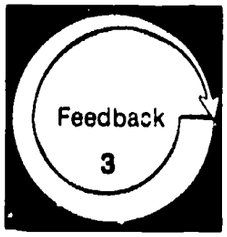
Comments:

10. Were supplemental instructional aids used to illustrate any steps that were difficult to observe? YES NO

Comments:

11. Did Mr. Martino ask students to analyze a new situation in relation to the concept? YES NO

Comments:



Compare your written critique of the case script with the model critique given below. Your circled responses should exactly duplicate the model responses. Your written comments need not exactly duplicate the model comments; however, you should have covered the same **major** points.

MODEL CRITIQUE FORM

1. YES. The law of supply and demand is easy to demonstrate by conducting a real sale.
2. YES. Since the demonstration involved the whole class as a part of the sale, all students could see what was going on.
3. YES and NO. The teacher used the uncomfortable temperature and the students' thirst—conditions they could easily relate to—in order to demonstrate the principle. He did not, however, tie the principle into past and future learning or indicate why they were studying the principle. However, this could be a function of the total lesson plan, not the smaller demonstration plan.
4. YES. Mr. Martino helped students arrive at their own definition of supply, demand, commodity, and equilibrium. He also had instruction sheets containing those definitions prepared for the class.
5. YES. The materials in this example were nothing more than a few cans of lemonade, a chalkboard, a flip chart, and some instruction sheets. The graphs were prepared and hidden on the flip chart ready to use.
6. YES. The demonstration was conducted in an orderly, coherent way so that students were gradually led to discover the law of supply and demand.
7. YES. Since student participation was essential in this demonstration, Mr. Martino was constantly observing students—their comments, questions, and other reactions. The nature of his direct questions to various students indicates that he was very aware of how well students were following the demonstration.
8. YES. Mr. Martino summarized key points throughout the demonstration. At the conclusion, when he said, "Now let's go over what we've learned once more," he involved students in summarizing the demonstration.
9. YES. Discussion continued throughout the demonstration, so that Mr. Martino got continual feedback about whether the class understood the principle. Their summary comments provided further feedback concerning their understanding of what had been demonstrated.
10. YES. Mr. Martino used graphs drawn on a flip chart as an instructional aid to illustrate the point of equilibrium.
11. YES and NO. Mr. Martino dismissed the class after a discussion revealed that they understood the law of supply and demand in terms of the lemonade demonstration. But evidence of whether a principle has been understood comes from knowing whether a student can apply it in a new learning situation. Mr. Martino could have offered another example and let students analyze it in terms of the principle.

    However, as they were leaving, he asked them to "think of other situations we can apply the law of supply and demand to." Perhaps in subsequent classes, he will ask the students to analyze one of these situations in relation to the principle.

Level of Performance: Your circled responses should have exactly duplicated the model responses; your written comments should have covered the same **major** points as the model comments. If you missed some points or have questions about any additional points you made, review the material in the information sheet, Demonstrating Concepts and Principles, pp. 6–12, or check with your resource person if necessary.

Your institution may have available videotapes showing examples of teachers demonstrating concepts or principles. If so, you may wish to view one or more of these videotapes. You might also choose to critique the performance of each teacher in demonstrating a concept or principle, using the criteria provided in this module or critique forms or checklists provided by your resource person.

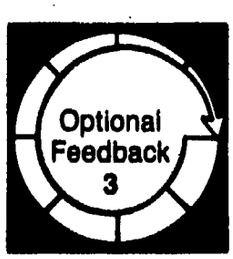
Learning Experience III

OVERVIEW

In a simulated classroom or laboratory situation, demonstrate a concept or principle.

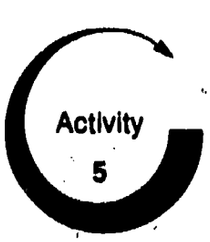
You will be selecting the concept or principle that you will demonstrate.

You will be completing the Demonstration Plan Sheet, pp. 33–34.



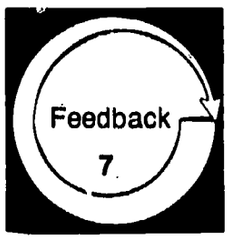
You may wish to have your resource person review the adequacy of your plan.

You will be selecting, obtaining, or preparing the materials and equipment needed for your demonstration.



You will be presenting the demonstration to a group of peers or to your resource person.

You may wish to record your demonstration on videotape for self-evaluation purposes.



Your competency in demonstrating a concept or principle will be evaluated by your peers or by your resource person, using copies of the Concept/Principle Demonstration Checklist, pp. 37–47.

If you videotape your presentation, you may wish to evaluate your own performance, using a copy of the Concept/Principle Demonstration Checklist, pp. 37–47.

Select a concept or principle that must be understood by students in your occupational specialty if they are to succeed in that occupation. A sample list of concepts and principles follows. You may select one from the list or another one more specific to your area. Check with your resource person if you have difficulty selecting a concept or principle to demonstrate.

SAMPLE CONCEPTS AND PRINCIPLES

- Food chain
- Natural balance
- Optimal wildlife (or plant) population
- Point of diminishing returns
- Selective breeding
- Balanced diet
- Least cost diet
- Budget
- Debit and credit
- Margin of profit
- Markup
- Interest
- Resistance
- Overhead
- Depreciation
- Viscosity
- Mechanical advantage
- Boyle's law
- Hooke's law
- Ohm's law
- Conductivity of heat
- Color balancing
- Proper fit
- Posture
- Reproduction
- Human traits

NOTES

Once you have decided on the concept or principle to be demonstrated, you need to select a specific example of the concept or principle. You also need to develop a plan for demonstrating the concept or principle using that specific example. You may use the planning sheet below or a plan suggested by your resource person to guide your planning.

DEMONSTRATION PLAN SHEET

CONCEPT/PRINCIPLE TO BE DEMONSTRATED: _____

_____

SUMMARY OF CONCEPT/PRINCIPLE: _____

_____

_____

INTRODUCTION METHOD:

TERMS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

STEPS TO BE FOLLOWED:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

KEY POINTS TO BE EMPHASIZED:

1. _____

2. _____

3. _____

4. _____

5. _____

MATERIALS, EQUIPMENT, AND VISUAL AIDS NEEDED:

1. _____

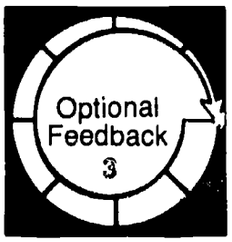
2. _____

3. _____

4. _____

SUMMARY AND/OR FEEDBACK METHOD:

NEW APPLICATION SITUATION:



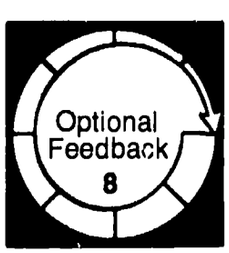
You may wish to have your resource person review the adequacy of your plan.

Based on your plan, select, obtain, or prepare the materials and equipment you will need for your demonstration.

In a simulated classroom situation, present your demonstration to a group of at least two to five peers. These peers will serve two functions: (1) they will role-play the students to whom you are presenting your demonstration, and (2) they will evaluate your performance. If peers are not available to you, you may present your demonstration to your resource person.

If you wish to self-evaluate, you may record your performance on videotape so you may view your own demonstration at a later time.

Multiple copies of the Concept/Principle Demonstration Checklist are provided in this learning experience, pp. 37–47. Give a copy to each peer or to your resource person before making your presentation in order to ensure that each knows what to look for in your lesson. However, indicate that, during the demonstration, all attention is to be directed toward you and that the checklists are to be completed **after** the demonstration is finished.



If you videotaped your lesson, you may wish to self-evaluate using a copy of the Concept/Principle Demonstration Checklist, pp. 37–47.

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the stops of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

CONCEPT/PRINCIPLE DEMONSTRATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In demonstrating the concept or principle, the teacher:				
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

Learning Experience IV

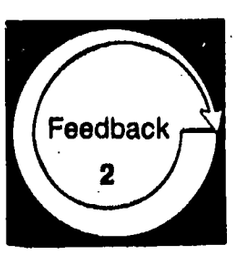
FINAL EXPERIENCE

In an **actual teaching situation,*** demonstrate a concept or principle.

As you plan your lessons, decide when demonstrating a concept or principle could be used effectively to aid you in meeting the lesson objectives. Based on that decision, demonstrate a concept or principle. This will include—

- selecting, modifying, or developing a lesson plan that includes detailed plans for presenting such a demonstration
- locating and/or developing all necessary equipment and materials
- preparing the physical setting for the demonstration
- presenting the lesson to the class

NOTE: Your resource person may want you to submit your written lesson plan to him/her for evaluation before you present your lesson. It may be helpful for your resource person to use the TPAF from Module B–4, *Develop a Lesson Plan*, to guide his/her evaluation.



Arrange in advance to have your resource person observe your lesson presentation.

Your total competency will be assessed by your resource person, using the Teacher Performance Assessment Form, p. 51.

Based upon the criteria specified in this assessment instrument, your resource person will determine whether you are competent in demonstrating a concept or principle.

*For a definition of "actual teaching situation," see the inside back cover.

NOTES

TEACHER PERFORMANCE ASSESSMENT FORM

Demonstrate a Concept or Principle (C-17)

Directions: Indicate the level of the teacher's accomplishment by placing an X in the appropriate box under the LEVEL OF PERFORMANCE heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

In demonstrating the concept or principle, the teacher:	LEVEL OF PERFORMANCE					
	N/A	None	Poor	Fair	Good	Excellent
1. selected an example of the concept or principle that could be easily demonstrated	☐	☐	☐	☐	☐	☐
2. set up the demonstration where it could be easily viewed by each student	☐	☐	☐	☐	☐	☐
3. related the new concept or principle to students' own experiences or previous instruction	☐	☐	☐	☐	☐	☐
4. defined terms or gave background information when necessary	☐	☐	☐	☐	☐	☐
5. had all materials and equipment ready for use	☐	☐	☐	☐	☐	☐
6. performed the steps of the demonstration in a logical order	☐	☐	☐	☐	☐	☐
7. observed students to see that they were following the demonstration	☐	☐	☐	☐	☐	☐
8. summarized key points during the demonstration and/or at the conclusion of the demonstration	☐	☐	☐	☐	☐	☐
9. determined students' comprehension of the concept or principle by obtaining some form of feedback	☐	☐	☐	☐	☐	☐
10. used visual aids to illustrate any steps that were difficult to observe	☐	☐	☐	☐	☐	☐
11. had students analyze a new situation in relation to the concept or principle	☐	☐	☐	☐	☐	☐

Level of Performance: All items must receive N/A, GOOD or EXCELLENT responses. If any item receives a NONE, POOR, or FAIR response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

UPD 3221/8-84

ABOUT USING THE NATIONAL CENTER'S PBTE MODULES

Organization

Each module is designed to help you gain competency in a particular skill area considered important to teaching success. A module is made up of a series of learning experiences, some providing background information, some providing practice experiences, and others combining these two functions. Completing these experiences should **enable** you to achieve the **terminal** objective in the final learning experience. The final experience in each module always requires you to demonstrate the skill in an actual teaching situation when you are an intern, a student teacher, an inservice teacher, or occupational trainer.

Procedures

Modules are designed to allow you to individualize your teacher education program. You need to take only those modules covering skills that you do not already possess. Similarly, you need not complete any learning experience within a module if you already have the skill needed to complete it. Therefore, before taking any module, you should carefully review (1) the introduction, (2) the objectives listed on p. 4, (3) the overviews preceding each learning experience, and (4) the final experience. After comparing your present needs and competencies with the information you have read in these sections, you should be ready to make one of the following decisions:

- That you do not have the competencies indicated and should complete the entire module
- That you are competent in one or more of the enabling objectives leading to the final learning experience and, thus, can omit those learning experiences
- That you are already competent in this area and are ready to complete the final learning experience in order to "test out"
- That the module is inappropriate to your needs at this time

When you are ready to complete the final learning experience **and** have access to an actual teaching situation, make the necessary arrangements with your resource person. If you do not complete the final experience successfully, meet with your resource person and arrange to (1) repeat the experience or (2) complete (or review) previous sections of the module or other related activities suggested by your resource person before attempting to repeat the final experience.

Options for recycling are also available in each of the learning experiences preceding the final experience. Any time you do not meet the minimum level of performance required to meet an objective, you and your resource person may meet to select activities to help you reach competency. This could involve (1) completing parts of the module previously skipped, (2) repeating activities, (3) reading supplementary resources or completing additional activities suggested by the resource person, (4) designing your own learning experience, or (5) completing some other activity suggested by you or your resource person.

Terminology

Actual Teaching Situation: A situation in which you are actually working with and responsible for teaching secondary or postsecondary vocational students or other occupational trainees. An intern, a student teacher, an inservice teacher, or other occupational trainer would be functioning in an actual teaching situation. If you do **not** have access to an actual teaching situation when you are taking the module, you can complete the module **up to** the final learning experience. You would then complete the final learning experience later (i.e., when you have access to an actual teaching situation).

Alternate Activity or Feedback: An item that may **substitute** for required items that, due to special circumstances, you are unable to complete.

Occupational Specialty: A specific area of preparation within a vocational service area (e.g., the service area Trade and Industrial Education includes occupational specialties such as automobile mechanics, welding, and electricity.

Optional Activity or Feedback: An item that is not required but that is designed to **supplement** and enrich the required items in a learning experience.

Resource Person: The person in charge of your educational program (e.g., the professor, instructor, administrator, instructional supervisor, cooperating/supervising/classroom teacher, or training supervisor who is guiding you in completing this module).

Student: The person who is receiving occupational instruction in a secondary, postsecondary, or other training program.

Vocational Service Area: A major vocational field: agricultural education, business and office education, marketing and distributive education, health occupations education, home economics education, industrial arts education, technical education, or trade and industrial education.

You or the Teacher/Instructor: The person who is completing the module.

Levels of Performance for Final Assessment

N/A: The criterion was not met because it was **not applicable** to the situation.

None: No attempt was made to meet the criterion, although it was relevant.

Poor: The teacher is unable to perform this skill or has only **very limited ability** to perform it.

Fair: The teacher is unable to perform this skill in an acceptable manner but has **some ability** to perform it.

Good: The teacher is able to perform this skill in an **effective** manner.

Excellent: The teacher is able to perform this skill in a **very effective** manner.

Titles of the National Center's Performance-Based Teacher Education Modules

Category A: Program Planning, Development, and Evaluation

A-1 Prepare for a Community Survey
A-2 Conduct a Community Survey
A-3 Report the Findings of a Community Survey
A-4 Organize an Occupational Advisory Committee
A-5 Maintain an Occupational Advisory Committee
A-6 Develop Program Goals and Objectives
A-7 Conduct an Occupational Analysis
A-8 Develop a Course of Study
A-9 Develop Long-Range Program Plans
A-10 Conduct a Student Follow-Up Study
A-11 Evaluate Your Vocational Program

Category B: Instructional Planning

B-1 Determine Needs and Interests of Students
B-2 Develop Student Performance Objectives
B-3 Develop a Unit of Instruction
B-4 Develop a Lesson Plan
B-5 Select Student Instructional Materials
B-6 Prepare Teacher-Made Instructional Materials

Category C: Instructional Execution

C-1 Direct Field Trips
C-2 Conduct Group Discussions, Panel Discussions, and Symposiums
C-3 Employ Brainstorming, Buzz Group, and Question Box Techniques
C-4 Direct Students in Instructing Other Students
C-5 Employ Simulation Techniques
C-6 Guide Student Study
C-7 Direct Student Laboratory Experience
C-8 Direct Students in Applying Problem-Solving Techniques
C-9 Employ the Project Method
C-10 Introduce a Lesson
C-11 Summarize a Lesson
C-12 Employ Oral Questioning Techniques
C-13 Employ Reinforcement Techniques
C-14 Provide Instruction for Slower and More Capable Learners
C-15 Present an Illustrated Talk
C-16 Demonstrate a Manipulative Skill
C-17 Demonstrate a Concept or Principle
C-18 Individualize Instruction
C-19 Employ the Team Teaching Approach
C-20 Use Subject Matter Experts to Present Information
C-21 Prepare Bulletin Boards and Exhibits
C-22 Present Information with Models, Real Objects, and Flannel Boards
C-23 Present Information with Overhead and Opaque Materials
C-24 Present Information with Filmstrips and Slides
C-25 Present Information with Films
C-26 Present Information with Audio Recordings
C-27 Present Information with Televised and Videotaped Materials
C-28 Employ Programmed Instruction
C-29 Present Information with the Chalkboard and Flip Chart
C-30 Provide for Students' Learning Styles

Category D: Instructional Evaluation

D-1 Establish Student Performance Criteria
D-2 Assess Student Performance: Knowledge
D-3 Assess Student Performance: Attitudes
D-4 Assess Student Performance: Skills
D-5 Determine Student Grades
D-6 Evaluate Your Instructional Effectiveness

Category E: Instructional Management

E-1 Project Instructional Resource Needs
E-2 Manage Your Budgeting and Reporting Responsibilities
E-3 Arrange for Improvement of Your Vocational Facilities
E-4 Maintain a Filing System
E-5 Provide for Student Safety
E-6 Provide for the First Aid Needs of Students
E-7 Assist Students in Developing Self-Discipline
E-8 Organize the Vocational Laboratory
E-9 Manage the Vocational Laboratory
E-10 Combat Problems of Student Chemical Use

Category F: Guidance

F-1 Gather Student Data Using Formal Data-Collection Techniques
F-2 Gather Student Data Through Personal Contacts
F-3 Use Conferences to Help Meet Student Needs
F-4 Provide Information on Educational and Career Opportunities
F-5 Assist Students in Applying for Employment or Further Education

Category G: School-Community Relations

G-1 Develop a School-Community Relations Plan for Your Vocational Program
G-2 Give Presentations to Promote Your Vocational Program
G-3 Develop Brochures to Promote Your Vocational Program
G-4 Prepare Displays to Promote Your Vocational Program
G-5 Prepare News Releases and Articles Concerning Your Vocational Program
G-6 Arrange for Television and Radio Presentations Concerning Your Vocational Program
G-7 Conduct an Open House
G-8 Work with Members of the Community
G-9 Work with State and Local Educators
G-10 Obtain Feedback about Your Vocational Program

Category H: Vocational Student Organization

H-1 Develop a Personal Philosophy Concerning Vocational Student Organizations
H-2 Establish a Vocational Student Organization
H-3 Prepare Vocational Student Organization Members for Leadership Roles
H-4 Assist Vocational Student Organization Members in Developing and Financing a Yearly Program of Activities
H-5 Supervise Activities of the Vocational Student Organization
H-6 Guide Participation in Vocational Student Organization Contests

Category I: Professional Role and Development

I-1 Keep Up to Date Professionally
I-2 Serve Your Teaching Profession
I-3 Develop an Active Personal Philosophy of Education
I-4 Serve the School and Community
I-5 Obtain a Suitable Teaching Position
I-6 Provide Laboratory Experiences for Prospective Teachers
I-7 Plan the Student Teaching Experience
I-8 Supervise Student Teachers

Category J: Coordination of Cooperative Education

J-1 Establish Guidelines for Your Cooperative Vocational Program
J-2 Manage the Attendance, Transfers, and Terminations of Co-Op Students
J-3 Enroll Students in Your Co-Op Program
J-4 Secure Training Stations for Your Co-Op Program
J-5 Place Co-Op Students on the Job
J-6 Develop the Training Ability of On-the-Job Instructors
J-7 Coordinate On-the-Job Instruction
J-8 Evaluate Co-Op Students' On-the-Job Performance
J-9 Prepare for Students' Related Instruction
J-10 Supervise an Employer-Employee Appreciation Event

Category K: Implementing Competency-Based Education (CBE)

K-1 Prepare Yourself for CBE
K-2 Organize the Content for a CBE Program
K-3 Organize Your Class and Lab to Install CBE
K-4 Provide Instructional Materials for CBE
K-5 Manage the Daily Routines of Your CBE Program
K-6 Guide Your Students Through the CBE Program

Category L: Serving Students with Special/Exceptional Needs

L-1 Prepare Yourself to Serve Exceptional Students
L-2 Identify and Diagnose Exceptional Students
L-3 Plan Instruction for Exceptional Students
L-4 Provide Appropriate Instructional Materials for Exceptional Students
L-5 Modify the Learning Environment for Exceptional Students
L-6 Promote Peer Acceptance of Exceptional Students
L-7 Use Instructional Techniques to Meet the Needs of Exceptional Students
L-8 Improve Your Communication Skills
L-9 Assess the Progress of Exceptional Students
L-10 Counsel Exceptional Students with Personal-Social Problems
L-11 Assist Exceptional Students in Developing Career Planning Skills
L-12 Prepare Exceptional Students for Employability
L-13 Promote Your Vocational Program with Exceptional Students

Category M: Assisting Students in Improving Their Basic Skills

M-1 Assist Students in Achieving Basic Reading Skills
M-2 Assist Students in Developing Technical Reading Skills
M-3 Assist Students in Improving Their Writing Skills
M-4 Assist Students in Improving Their Oral Communication Skills
M-5 Assist Students in Improving Their Math Skills
M-6 Assist Students in Improving Their Survival Skills

RELATED PUBLICATIONS

Student Guide to Using Performance-Based Teacher Education Materials
Resource Person Guide to Using Performance-Based Teacher Education Materials
Guide to the Implementation of Performance-Based Teacher Education
Performance-Based Teacher Education: The State of the Art, General Education and Vocational Education

For information regarding availability and prices of these materials contact—AAVIM, American Association for Vocational Instructional Materials, 120 Driftmier Engineering Center, University of Georgia, Athens, Georgia 30602, (404) 542-2586

ISBN 0-89606-203-1