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ABSTRACT

This learning module helps the teacher to master teaching skills that stimulate children to explore materials and to order their explorations in ways that lead to classification and that generate the child's own structuring of his discoveries and experiences. Teaching behaviors focused upon are congruent with Piagetian concepts about a child's cognitive development. Three activities are given for each of four objectives followed by optional activities and a post-assessment self-check and mastery test. An answer key is provided in the appendix. (JD)

TOWARD COMPETENCE

UCTIONAL MATERIALS FOR TEACHER EDUCATION

COMPETENCY BASED TEACHER EDUCATION PROJECT
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CLASSIFICATION SKILLS

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BARUCH COLLEGE

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WHAT IS COMPETENCY-BASED TEACHER EDUCATION?

The set of materials you are about to begin using represents a new direction in teacher education. Called competency-based teacher education, this approach to training teachers emphasizes the teacher's performance--what he or she is actually able to do as the result of acquiring certain knowledge or skills.

Performance in a specific area is referred to as a competency. Thus, what we expect the teacher to be like after completing his education can be described in terms of the competencies he should have. The emphasis is on doing rather than on knowing, though performance is frequently the result of knowledge.

This shift in emphasis from knowing to doing accounts, to a great extent, for the differences you will notice in the format and content of these materials. To begin with, the set of materials itself is called a module because it is thought of as one part of an entire system of instruction. The focus has been narrowed to one competency or to a small group of closely related competencies. The ultimate aim of the module is expressed as a terminal objective, a statement describing what you, the teacher, should be able to do as a result of successfully completing this module.

Your final performance, however, can usually be broken down into a series of smaller, more specific objectives. As you achieve each of these, you are taking a set toward fulfilling the ultimate goal of the module. Each intermediate objective is the focus of a group of activities designed to enable you to reach that objective.

Together, the activities that make up each element, or part, of the module, enable you to achieve the terminal objective.

There are several kinds of objectives, depending on what kind of performance is being demanded of you. For example, in a cognitive-based objective, the emphasis is on what you know. But since these are behavioral objectives, what you know can only be determined overtly. An objective can only be stated in terms of your behavior--what you can do. You might, for instance, be asked to demonstrate your knowledge of a subject by performing certain tasks, such as correctly completing arithmetic problems or matching words and definitions. In addition to cognitive-based objectives, there are performance-based objectives, where the criterion is your actual skill in carrying out a task; consequence-based objectives, for which your success in teaching something to someone else is measured; and exploratory objectives, which are open-ended, inviting you to investigate certain questions in an unstructured way.

Along with the assumption that the competencies, or behaviors, that make for successful teaching can be identified goes the assumption that these competencies can be assessed in some way. In fact, the statement of objectives and the development of assessment procedures form the main thrust of competency-based teacher education. The module, and the activities it contains or prescribes, is just a way of implementing the objectives.

But the module does have certain advantages as an instructional tool. For one thing, it enables you to work on your own and at your own pace. The activities are usually varied so that you can

select those which are best suited to your learning style. And the module enables you to cover certain subject areas with maximum efficiency; since if you pass the pre-assessment for a given objective, you are exempted from the module implementing that objective. What matters is not the amount of classroom time you put in on a subject but your ability to demonstrate certain competencies, or behaviors.

OVERVIEW

Since young children enter school settings with considerable diversity in their cognitive development and experience, and since they can be expected to develop at an individual pace, the teacher needs skills that will help him or her to differentiate activities and experiences for young children which are consistent with their current needs and which provide good opportunities for progress. Application of Piagetian theory on the development of intelligence enables the teacher to individualize instruction experiences in an orderly fashion.

This module helps the participant to master teaching skills which stimulate children to explore materials and to order their explorations in ways that lead to classification and that generate the child's own structuring of his discoveries and experiences. The teaching behaviors focused on in this module are congruent with such Piagetian concepts of the course of a child's cognitive development as the following:

1. Knowledge comes from the child's own actions on objects and from his reflections on these actions.
2. The child himself is the arbiter of his pace and his readiness for further progress.
3. The child becomes aware of his own thought through social interchange--child-child and adult-child--through active interaction, and through the sharing

of viewpoints and ideas.

4. Intelligence develops out of the child's own structuring of his concepts, not by absorbing ideas from others.
5. The child's own naturally active explorations can be counted upon to provide him with the pleasure and motivation needed for learning.
6. The child's selection of his activity is the best guarantee that he has found the level of difficulty appropriate for him.
7. Adults are important sources of challenge; they help children move from egocentric notions of reality to more objective and complex notions.
8. Children's "errors" are important sources of information for adults on the child's cognitive development, and they constitute a specific phase of development which is neither to be ignored nor corrected externally.
9. All content is not equally stimulating and familiar to children. Selection of good content and materials is helpful.
10. Children's cognitive development is not necessarily linear. There are "décalages," or uneven developments, at any particular level.
11. Concepts are not "verbalizations." Words are helpful to identify concepts, to compare them, to remember them; but words are not substitutes for young children's concepts.

The module deals with teacher behaviors that demonstrate an understanding of Piaget's theory of the development of intelligence and that implement this theory by helping children explore and sort materials in a way that leads to the development of classification skills. In addition, teaching behaviors which stimulate children's sorting and classifying activities can yield these payoffs:

1. Children's play, or playfulness, a naturally satisfying form of activity, gradually leads to logical thinking as direction and purpose evolve or are elicited.
2. Children's flexibility of thinking increases as they find additional ways to classify the same materials or to classify on more than one variable (for example, large blue circles) or to classify in hierarchies (for example, sparrows are included in birds, who are included in animals, who are included in living things). Teacher-child or child-child interaction with objects can also help the child to think more flexibly.
3. Children can practice or learn task orientation, focused attention, and longer attention spans in working with objects and with sorting and classification problems. Since children readily involve themselves in such activities with objects, important and basic forms of cognitive learning are easily advanced.

4. Children's sorting and classifying activities provide significant information about their development capabilities, which teachers need in order both to select useful and constructive learning activities for each child and to sequence these activities appropriately.

Prerequisites

In order to take this module, you should be either an undergraduate or a graduate student in early childhood education or educational psychology who has already had a course (or a module) dealing with Jean Piaget's theories on the cognitive development of children. You should also be in student teaching or in the graduate-level practicum.

How to Take This Module

Now that you have read the Overview, you can decide whether you want to go ahead with this module. (You should think of the module as the equivalent of approximately one-fifth of a three-credit course.) If you continue, you will be asked to complete certain basic steps. The first, which is optional, is the pre-assessment, a measure of your teaching ability in the area covered by this module. If you meet predetermined criteria, you can exit after completing the pre-assessment. In other words, success on the pre-assessment indicates that you don't need this module.

However, don't regard lack of success on the pre-assessment as failure. It is simply an indication of the fact that you need the skills you will gain from taking this module. The second step

for you, then, is the completion of the four elements of this module. Each one consists of a variety of activities designed to enable you to achieve the objective of that element. Together, these objectives make up the terminal objective of the module:

> You will be able, in a ten- to fifteen-minute videotape made in a field setting, to
>
> involve a child in the exploration of materials;
>
> elicit more varied explorations of the same materials;
>
> elicit the child's verbalization of the sorting variables;
>
> elicit from the child some progress toward either a more complex sorting problem or a statement of the rules underlying his sorting problem.

When you have completed all four elements, you will be ready for the post-assessment. Upon successful completion of the post-assessment, you can exit from the module. These steps are shown in graphic form on the flow chart on page 10.

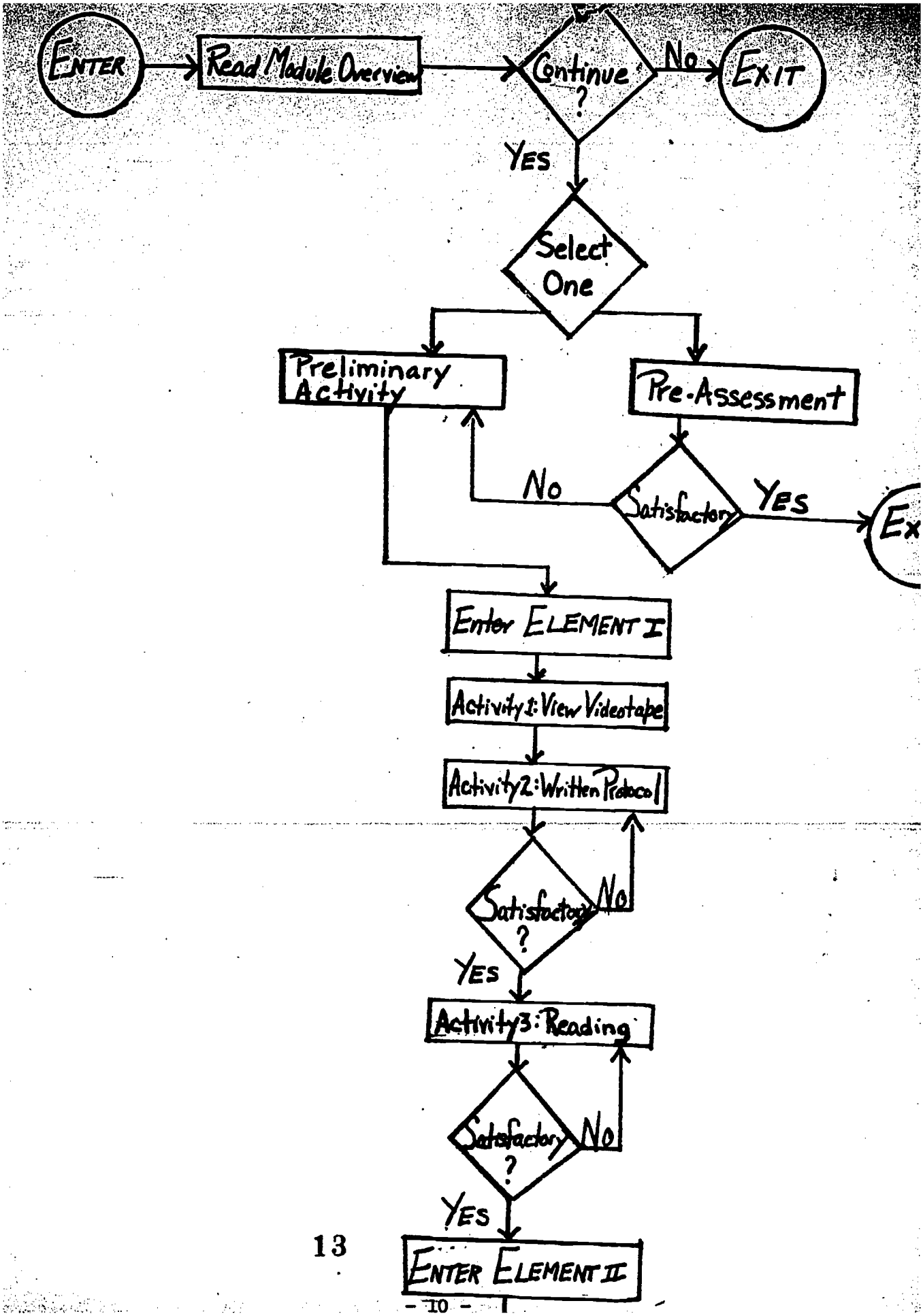
Contents of the Module

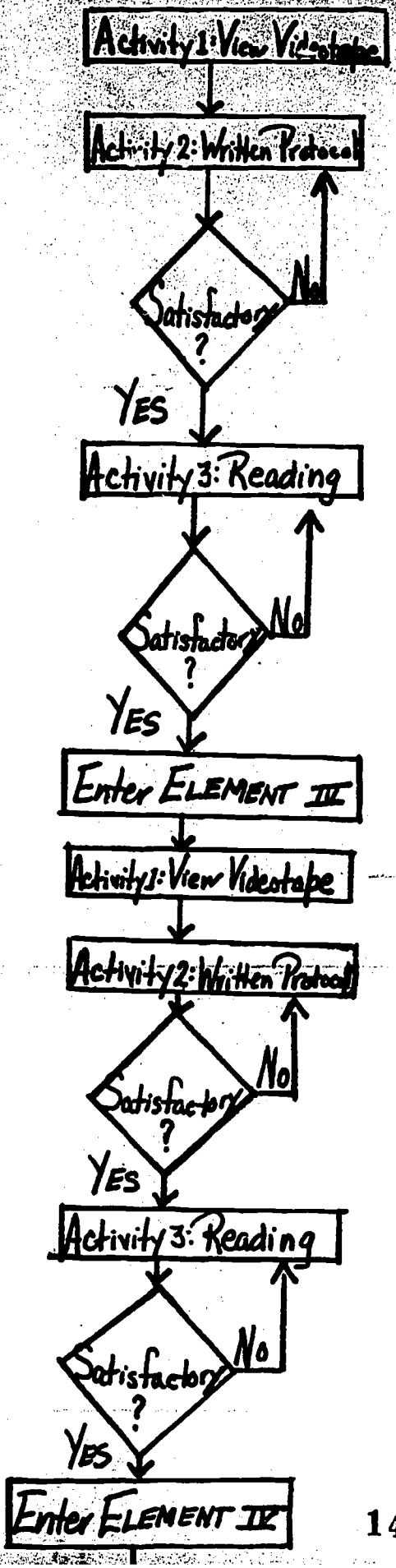
This module includes both required and optional activities. The required activities come first, beginning with a preliminary activity that serves as an introduction to the module as a whole. It consists of viewing a videotape in which the competencies that are the focus of this module are demonstrated. The videotape is in four parts, each one corresponding to the objective of one of the four elements of the module.

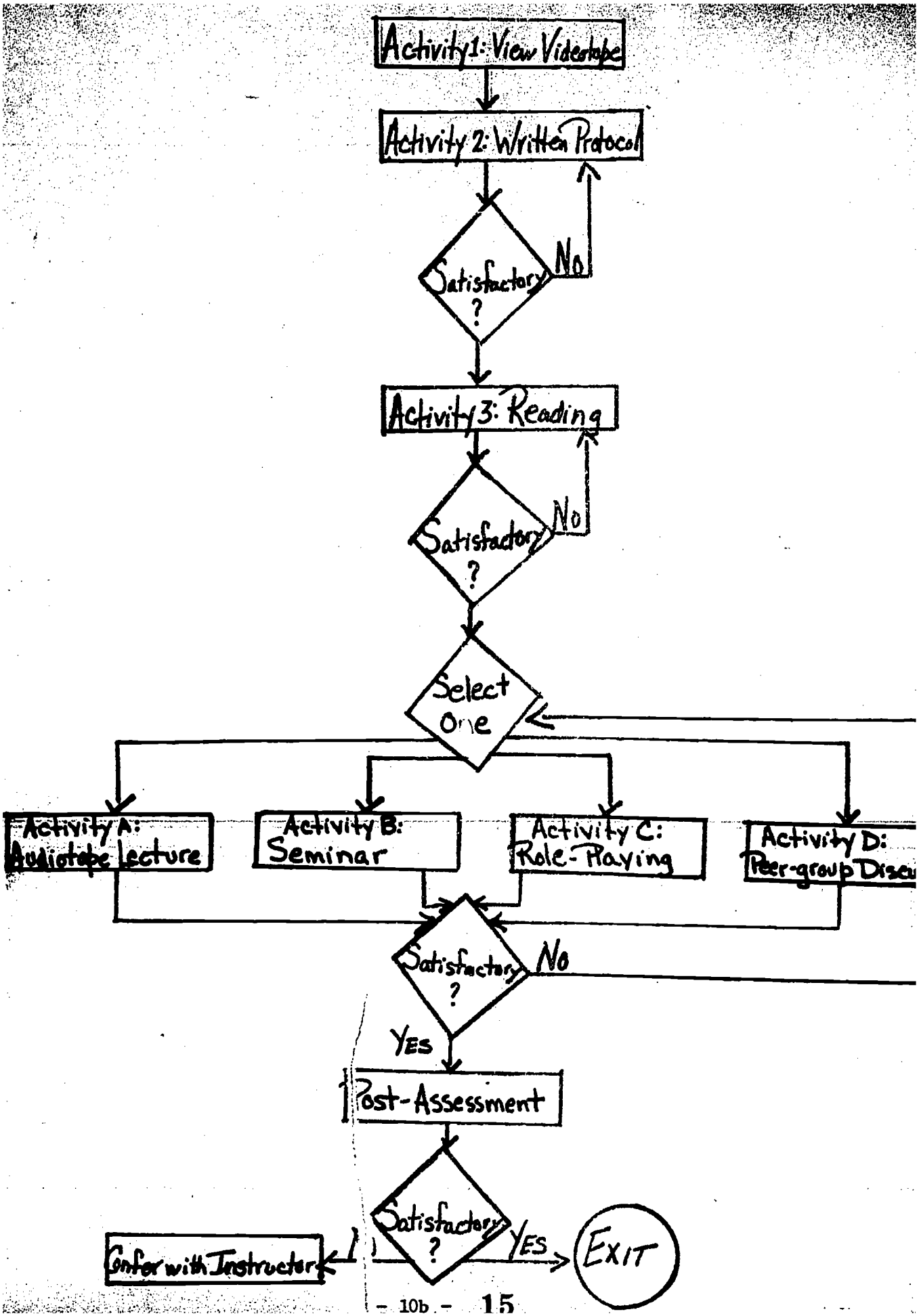
Following the viewing of the entire videotape, you will have an opportunity to see each section separately, as the first activity in each element. For the second activity, you will complete a self-check based on a written protocol derived from the taping of actual classroom activities. The third activity is a reading selection followed by a written self-check.

When you have completed these four groups of required activities, there are four optional activities in which all the elements of the module are synthesized, as they are in actual classroom situations. You are to complete at least one of these activities before going on to the post-assessment.

Finally, the various experiences of each element will be drawn together in your student teaching. Although this field practice is not built into the module as an activity, the tim you spend in the classroom will provide an invaluable opportunity to practice the behavior you saw modeled on the videotape and which you simulated in the written self-checks and in the role-playing activities. The field practice will also help you prepare for the mastery test that concludes the module.


Enter
Read Module Overview
Continue ?
No
Exit
Yes
Select One
Preliminary Activity
Pre-Assessment
No
Satisfactory
Yes
Ex
Enter ELEMENT I
Activity 1: View Videotape
Activity 2: Written Protocol
Satisfactory ?
No
Yes
Activity 3: Reading
Satisfactory ?
No
Yes
ENTER ELEMENT II


Activity 1: View Videotape
Activity 2: Written Protocol
Satisfactory ?
No
YES
Activity 3: Reading
Satisfactory ?
No
YES
Enter ELEMENT III
Activity 1: View Videotape
Activity 2: Written Protocol
Satisfactory ?
No
YES
Activity 3: Reading
Satisfactory ?
No
YES
Enter ELEMENT IV


Activity 1: View Videotape
Activity 2: Written Protocol
Satisfactory ?
No
Activity 3: Reading
Satisfactory ?
No
Select One
Activity A: Audiotape lecture
Activity B: Seminar
Activity C: Role-Playing
Activity D: Peer-group Discu
Satisfactory ?
No
Yes
Post-Assessment
Satisfactory ?
Yes
Exit
Confer with Instructor

PRE-ASSESSMENT

There is no required pre-assessment for this module. If you meet the prerequisites and if, on the basis of the overview you have just read, you may decide you want to take this module, turn to the preliminary activity on page 12 and begin.

However, if you think that you may not need this module--that you may already have the competencies which are the terminal objective of the module--then you should take the mastery test beginning on page 64. If the results of the mastery test indicate that you need no further work in this area, you are free to choose a different module or to proceed with whatever project you and your instructor agree on.

If the mastery test shows that you need improvement in one or more of the competencies covered by this module, decide with your instructor which of the four elements of the module you should work on. When you have finished the module, you will check your progress by taking the mastery test again as a post-assessment.

Preliminary Activity

The first instructional activity will provide you with an overview of the entire module. Everyone taking the module should participate in this activity; and since it involves viewing a videotape, you may want to arrange to complete this activity as a group.

Before viewing the videotape accompanying this module, read the following background information and notes on what to be aware of as you watch the teachers on the tape. When you have seen the videotape, go on to Element I, which begins on page 14.

Contents. The videotape includes several examples of each major teaching competency, or objective of this module:

1. Involving the child with materials.
2. Stimulating exploration of greater variety.
3. Eliciting child's verbalization.
4. Formulating a problem.

The teaching personnel were all student teachers in their senior year at Bernard M. Baruch College, CUNY, specializing in early childhood education, and all three student teachers happen to be working in prekindergarten classes, with four- and five-year-old children. (Similar videotapes were recorded in kindergartens and in first and second grades, and transcriptions from some of these tapes form the basis of the second activity in each of the module's four elements.)

Relationship with children. Note that although their styles differ, all three student teachers included in this videotape demonstrated basically similar attitudes toward the children:

--respectfulness

--encouraging, positive nonverbal and verbal posture

--acceptance of child's actions and notions

--warmth without false sentiment

--approval of child's spontaneity

--approval and encouragement of playfulness

--absence of punitiveness or of negative teaching techniques

In all cases, the student teachers are working within a familiar field setting, with children they know well and with whom comfortable, warm relationships are already established. It must be stressed that these positive relationships with children are regarded as essential to the mastery of the teaching competencies featured in this module.

Urban school settings. Two different school settings are shown in this module, but both are "Title I" New York City schools in Manhatten. Such schools generally have large proportions of economically disadvantaged children and of children from minority groups, especially black and Hispanic children. The student teacher who is shown sitting on the floor with a child is working with a bilingual child. As you will see, she stresses vocabulary and establishes word meanings frequently.

ELEMENT I

Objective:

Given one or more sets of materials that can be sorted or classified in some way, you will be able to involve a young child with the materials.

Activity 1

As the first step in meeting the objective for this element, view again the first section of the videotape accompanying the module. Remember that this activity is required, not optional. Before you see the videotape, read the following paragraphs, which will help direct your attention to some of the details in the videotape presentation, as well as to some of the points to consider in selecting and presenting materials. After you have seen the videotape, go on to Activity 2.

One student teacher on the videotape offers a child a button collection, while the other two use attribute blocks or similar materials. Selection of materials is usually not a problem, since children usually are willing to become involved with any materials the teacher offers. However, some children may respond more positively to some materials than others, and some materials present instant excitement, especially any form of water play. It is important to be aware of the child's response and of when it

might be appropriate to offer him a choice of materials. A choice of materials, or a change of materials, may be helpful to a restless child. If you work tutorially with a single child, at a space cleared of other distractions, and if you convey expectations of interest, almost any collection of materials will do.

Materials collections should be neither too small--that is, less than twelve items--nor too large--that is, more than about twenty. Too many materials clutter the space and obscure the features that you want the child to note. Too few items offer too little practice with whatever concepts you want to develop.

Materials collections must offer possibilities for sorting on three or more variables, such as shape, color, size, length, thickness, texture, buoyancy or weight. Fewer than three variables limits conceptual development possibilities. Note in the videotape that each child is offered some kind of sorting equipment--for example, boxes or other containers, loops or yarn, or a space marked out on a large mat. This equipment serves to indicate to the child--with or without the teacher's verbalizations or nonverbal actions--how he or she can distribute the materials.

Note the involvement of the student teachers who use questions or suggestions to help the children put some order or structure into their involvement with the materials. Also note the nonverbal actions of the student teachers who frequently touch or move items.

The student teachers work with the children, but generally emphasize the children's own actions and encourage them to manipulate the materials. Note the verbal suggestions used, such as, "Can you find some way to arrange the objects on each tray?" The teacher working with the bilingual child says, "Run your hand around the boundary of the circle and the square," demonstrating while she speaks, so that the child has no difficulty understanding the suggestion.

Initially, the object is to involve the child in exploratory activity with the materials, in ways that inevitably help him or her to notice the characteristics of the objects, and possibly, the ways in which the objects are either similar or different. Notice, for example, how much handling and touching Sylvia does in trying to stack the attribute blocks or to build some structures with them. (Sylvia is the child who wears glasses.)

Activity 2

Unless the child has already had very extensive play experiences with many different types of materials, the first goal is to stimulate the child to explore materials. Manipulating objects, finding out what they are, how they behave, and what you can do with them, is a prime purpose of many early childhood educational activities. New objects have to be explored, identified, and handled in many ways, so that their attributes become known. Children have to learn, through their own actions, the many ways objects can go together, as they learn how some objects are alike and how they differ from other objects.

It is not difficult to involve the child with materials. Some of the approaches teachers use are illustrated below. Other ways, not specified here, include cooking, carpentry, art and craft projects, and many science and social studies projects.

The written protocol that follows is a transcript of a series of actual classroom situations. Notice that each statement is numbered and that after each statement in the protocol there is a numbered blank in the margin. Read through the protocol once; then, following the directions at the end, mark the numbered blanks according to what sort of evidence is provided in that section of the protocol. Remember that each blank <u>follows</u> the appropriate description or piece of dialogue.

A. 1. The teacher and the child sit together at a small table in a first-grade classroom. 2. The teacher offers the 1.____

child a carton of objects, and he accepts the carton expectantly and starts to remove objects from the box. 3. The child asks, as he removes objects from the box, "What am I going to do?"

4. The teacher responds, "What would you like to do?" 5. Suppose you take those things out of the box and put them into these two containers. 6. Do you think you can sort them in a special way, so that things that are the same in some way can go together?"

7. The child removes objects from the carton, handles them, and begins to place some in one container and some in the other. 8. The teacher, holding the carton for the child, asks, "Would you like to dump them out?"

B. 9. A teacher and child sit together at an empty table in a first-grade classroom. 10. The teacher asks the child whether she knows the words "rough" and "smooth." The child nods. 12. The teacher holds a bag of objects and asks the child to close her eyes and feel an object placed in her hand. 13. The teacher asks, "How does it feel?" 14. The child responds, "Smooth. It feels smooth." 15. The teacher, touching the object says, "It is smooth. It's the handle of a nail file. Now feel the file part." 16. The child feels the file and remarks, "It's rough."

17. The teacher tells the child,"Maureen, we're going to play a guessing game. You put your hand in this bag, close your eyes, take something out, and tell me whether it's rough or smooth. 18. When you take things out, you'll

2._____
3._____
4._____
5._____
6._____
7._____
8._____
9._____
10._____
11._____
12._____
13._____
14._____
15._____
16._____
17._____

need a place to put them. 19. I'm making two circles out of this yarn. 20. I'm making one big circle here. 21. You pick yarn of whatever color you like and make a big circle next to mine. 22. These are our words, rough and smooth. 23. Please put a word card in each circle. 24. When you take something out of the bag, put it in either the rough circle or the smooth circle.

18._____
19._____
20._____
21._____
22._____
23._____
24._____

C. 25. A teacher and a child sit at a table in the kindergarten. 26. On the table is a pile of paper plates. 27. The teacher holds a bag with objects. 28. The teacher says, "I'm going to give you four paper plates. Put your hand in the bag and take things out, and put them on the paper plates. 29. Can you put those things that go together on one plate?"

25._____
26._____
27._____
28._____
29._____

D. 30. A second-grade teacher asks a child to choose which of two boxes of objects he would prefer to work with today. 31. He selects one box. 32. The teacher says, "You decided to work with buttons? Let's dump them on the table." 33. The teacher adds, "I have two boxes here. Do you think you can separate them and put those things that go together in each box?"

30._____
31._____
32._____
33._____

E. 34. The kindergarten teacher tells a child, "I have a bag with some things on the floor, and here are four paper plates on the table. 35. I'm doing something, and as soon as you know what I'm doing, you do it." 36. The teacher takes two objects out of the bag and places one on each of two plates.

34._____
35._____
36._____

37. The teacher asks, "Do you think you know what I'm doing?" 38. The child replies, "Yes," and takes over the sorting. 37._____ 38._____

1. Check in red pencil or pen all numbered blanks, 1-38, in which the protocol provides evidence that the child is involved with materials.
   Enter here the numbers checked:

2. Check in green pencil or pen all numbered blanks in which the child appears to become involved with materials without verbalization from the teacher.
   Enter here the numbers checked:

3. Check in blue pencil or pen all numbered blanks in which the child is, in effect, requested to determine his own sorting base because the base is not specified by the teacher.
   Enter here the numbers checked:

4. Mark with an X the numbers of the blanks in which the teacher specifies a sorting base.
   Enter here the numbers marked:

5. Mark with a circle the numbers of the blanks in which the teacher stimulates the child's involvement with materials by initiating some sorting and requesting the child to follow suit.

   Enter here the numbers marked:

6. Mark with a square the numbers of the blanks in which the teacher is manipulating the materials, either with or without verbalization.

   Enter here the numbers marked:

7. Mark with a triangle the numbers of the blanks in which the child is offered a choice of materials.

   Enter here the numbers marked:

When you have finished, turn to page 69 of the Appendix to check your answers. If you made more than eight errors, repeat this activity. If not, go on to Activity 3.

Activity 3

Again, this is a required activity. To complete it successfully, read at least two of the selections listed on page 74 of the Appendix and then answer the questions that follow. Check your answers on page 69 of the Appendix. If you had eight or more correct, go on to Element II. If fewer than eight of your answers were correct,

either reread the material or choose another reading selection and then try the questions again. (You may also want to refer to some of the other reading selection to clarify any questions you were unsure of).

Self-check

Check all the statements that are correct.

_____1. Children are likely to become most involved with materials on a voluntary basis.

_____2. A child who has a choice of materials is most likely to select objects with which he is willing to work for some time.

_____3. The child is most likely to be task-oriented when the teacher assigns materials to him.

_____4. The teacher should discourage playfulness with materials because the child is likely to get sidetracked.

_____5. Manipulation and exploration of objects tends to generate high interest and curiousity.

_____6. The child learns how objects behave, how they interact with other things, and what their characteristics are by playing with them.

_____7. The child should be prevented from playing repetitively with objects and should be told what non-repetitive actions he should do.

_____8. The child is likely to accept an invitation to work with almost any materials from a teacher who has established

a relationship with him.

_____9. Involvement with materials, and exploration of them, can be demonstrated by the teacher, to save time for more demanding learning by the children.

_____10. The child should be taught to sort and classify on bases determined by adults to be sure he always gets the right answer.

Objective:

Given one or more sets of materials that can be sorted or classified in some way, you will be able to help or encourage a young child to explore the materials in a variety of ways.

Activity 1

For this activity, view again the second section of the videotape accompanying this module. Before you begin, read the material that follows, noting the skills and techniques you will see demonstrated in the videotape. After you have seen the videotape, go on to Activity 2.

The goal here is to encourage or help the child to find out more about the objects he's working with by doing different things with those objects.

In the first scene, where the student teacher and child sit on the floor, two techniques are demonstrated.

1. The student teacher helps the child to "break set" that is, to forget about or disregard previous sorting and to try and see fresh possibilities. The student teacher attempts to "break set" by sweeping all the

objects off the mat. This is similar to a fresh st rt. She emphasizes the fresh start by saying, "Do you see another way to put these things together?"

2. When the child is unable to make the requested fresh start, the student teacher initiates a new sorting without telling the child what the sorting base is. The student teacher plays a game, starts to sort, and says, "Watch me and when you see what I'm going to do, you do it." Notice again how frequently the student teacher names or labels objects to help this bilingual child acquire more English vocabulary.

In the second scene, the student teacher encourages the child to make careful sensory explorations of the objects and works with the child to focus on noting more characteristics of the objects. The student teacher says, "Touch this, Jill. What do you feel? Feel both buttons, then you can tell me." She also encourages the child to make her observations explicit by asking, "What do you think?"

In the third scene two strategies are demonstrated: one is flexibility in shifti strategies; the other is the introduction of new equipment.

Note how the student teacher encourages and accepts playfulness, after the child ignores a challenge. She starts to draw the child's attention to the characteristics of objects on a tray, to challenge her by saying, "Can I put this piece on this tray?" This technique requires the child to determine whether the new piece "belongs," and if not, why not. Thus it is often successful in helping the child to make explicit observations about how the objects are alike or different.

Here, the student teacher, after initiating this strategy and finding the child too engrossed in her own playful explorations of the objects, encourages and accepts the playfulness instead. The student teacher then comments on the "house" the child is constructing. This demonstrated <u>flexibility in shifting strategies</u> is of inestimable importance in working with young children. It indicates the teacher's awareness of the child's spontaneous, autonomous behavior and her acceptance and encouragement of that behavior. Often, as happened here, the teacher's patience is rewarded later, and the child is again willing to accept the teacher's challenge or suggestions.

The student teacher introduces new exploratory possibilities, by making an offer of

new equipment--here, a simple balance beam. New playful explorations are opened up and new possibilities for sorting are made visible. Other new equipment items which can be introduced include a bowl of water, magnets, a ramp, pulleys, a more precise balance (such as one with hooks at measured intervals), a produce scale, a yardstick, and many more. New equipment not only offers more varied explorations to the child but often induces renewed interest and excitment.

Activity 2

If the child handles materials freely, will he note the different characteristics that objects have? If he sees a triangle, does he also note that while it has corners like a square or rectangle, the number of corners is different? And that it may be painted a bright color, such as red? That it may be made of wood and may be smaller than other triangles in a given collection, or thicker and heavier?

Once the child becomes involved in exploring the characteristics of objects, the teacher helps him to focus on more features than he might have noticed himself, in more ways than might have occurred to him. Stimulation of more varied explorations of materials may involve cooking, eating, creative art or music experiences, focused trips outside the classroom, playful manipulation of equipment with the materials, or working with other children who may contribute new ideas from their own

actions or experiences.

The written protocol in this activity includes descriptions of a few of the many ways to stimulate more varied explorations of materials. As in Element I, each statement is followed by a numbered blank in the margin. Read through the protocol once; then, following the directions at the end, mark the numbered blanks or answer the questions according to what sort of evidence is provided in that section of the protocol.

A. 1. A teacher works with a first-grade child at a table, with attribute blocks. 2. The child, after some initial sorting by shape, begins to make a construction with the squares and rectangles. 3. When the teacher asks how else she can put the objects together, the child says, "I can make a house." 4. The teacher says, "O.K. Let's see you make a house." 1.____ 2.____ 3.____ 4.____

5. After the child tries various combinations of blocks, which fall down, the teacher asks, "Can you make a house out of circles?" 6. The child continues to try to construct a "house" out of various shapes in the collection. 7. Then she says, "I can make a house out of squares." 8. She erects a wall out of the squares. 5.____ 6.____ 7.____ 8.____

B. 9. A teacher and a second-grade child work on sorting buttons. 10. The child sorts "fat" ones, "flat" ones without noting the possibility that "furry" ones may overlap "fat" and "flat." 11. Asked to find another way to sort the buttons, the child is unable to find one. 12. The teacher guides more varied explorations by starting to sort the buttons 9.____ 10.____ 11.____

into metal, plastic, wood, and furry ones, without mentioning the sorting base, saying "Can you follow what I'm doing? Can you help me?" 13. As the child begins to contribute to the sorting, placing each button correctly, it becomes clear she understands the sorting base. 14. When this sort is completed, the teacher directs the child's attention to the collection of plastic buttons, asking, "What can you do with the plastic buttons?" 15. In the child's new sub-grouping of the plastic group, based on color, it turns out that the child knows the color "grey" but is unable to label it. The teacher supplies the label.

16. A further change in exploratory activity occurs when the teacher offers the child a magnet, asking, "What can you do with this?" 17. A totally new basis for sorting is gradually invented by the child as she discovers that magnets can pick up buttons with metal shanks when the magnet touches the shank.

C. 18. A teacher works with a child in the pre-kindergarten at a corner table, with a varied collection of objects. 19. When he is asked to sort objects that go together in two different boxes, the child sorts busily, then explains that he put "fast" things in one box. 20. When the teacher offers him a ramp to play with, it becomes clear that he has already had such playful experiences with the ramp, and he is sorting on the basis of his recollection of whether the objects rolled down the ramp (were fast) or not. 21. Offered

12.____

13.____

14.____

15.____

16.____

17.____

18.____

19.____

20.____

the ramp again, the child checks his recollection of which things are "fast." 21.____

D. 22. A teacher invites a child in the kindergarten to place miniature furniture and household objects in a large wooden doll house. 23. He sorts and places objects happily for a long time by himself. 24. Later the teacher looks at his placement of objects and, without any negative connotation, asks him whether there is any other way these objects could be placed. 25. The child looks thoughtful, goes to the shelf to get a collection of miniature dolls which constitute a "family," places all the dolls in one of the rooms, and changes his placement of many items. 26. Asked by the teacher why objects now belong to the rooms in which he has placed them, the child says, "When the family is home, they need all the chairs in this room to sit together, and all the beds in this room for sleeping, and all the tables can stay together in this room in case there's a party."

22.____

23.____

24.____

25.____

26.____

1. Check in red pen or pencil all numbered blanks of those items which indicate playful exploration of materials. Enter here the numbers checked:

2. Check in green pen or pencil all numbered blanks of those items where the introduction of additional equipment or materials contributed to more varied explorations. Enter the numbers here:

3. Check in blue pen or pencil all numbered blanks of those items where the teacher initiated more varied explorations by asking questions.

   Enter the numbers here:

4. List ten additional ways to stimulate more varied explorations.

When you have finished, turn to page 69 of the Appendix to check your answers. If you made more than six errors, repeat this activity. If not, go on to Activity 3.

Activity 3

This activity involves reading two more of the selections listed on page 74 of the Appendix and answering the questions that follow. Check your answers on page 70 of the Appendix. If you had eight or more correct, go on to Element III. If fewer than eight of your answers were correct, either reread this material or choose another reading selection and then try the questions again. (You may also want to refer to some of the other selections to clarify any questions you were unsure of).

Self-check

Complete these incomplete sentences.

1. The attributes of objects child can learn by using a bowl of water include_____

_____

_____

2. With a magnet, a child can sort by _____

_____

_____

3. Offered a ramp and a collection of objects, a child could sort by_____

_____

_____

4. Food-tasting experiences might suggest sorting by_____

_____

_____

5. Cooking experiences can offer sorting by_____

_____

_____

6. Carpentry projects might suggest sorting by _____

_____

_____

7. Musical activities might suggest sorting by _____

_____

_____

8. Walks in the neighborhood might suggest sorting by _____

_____

_____

9. Buying trips to stores might suggest sorting by _____

_____

_____

10. Dramatic play in the housekeeping area might suggest sorting by _____

_____

_____

ELEMENT III

Objective:

Given a child sorting or classifying a set of materials, you will be able to elicit the child's verbalization of the sorting variables.

Activity 1

This time, arrange to see the third part of the videotape again. Before the viewing, read the following notes on what occurs in this section of the videotape. After you have seen the videotape, go on to Activity 2.

Throughout the videotape, the student teachers elicit verbalizations of the children's action. The particular focus of these scenes, however, is the ways in which you can help the child to formulate in words his understanding of what he is doing.

Some children seem very clear about their sort as they arrange objects but have difficulty saying what the sorting base is. Others may fortuitously arrange objects without any clear idea of a sorting base. When this confusion can be elicited verbally, the teacher is able to identify the child's developmental level and to proceed on that basis.

In the first scene, when Jill is asked, "Why do these buttons belong here?" she responds, "They're buttons" and "The tray doesn't break." When Jill accepts two trays instead of three, and lines up her buttons in a diagonal line, she explains her work in terms of a "parade." This is a typical playful, idiosyncratic response, which the student teacher accepts. But notice that this child is also capable, as she demonstrated, of sorting by color and of sorting by "buttons with material" and "buttons without material," with the student teacher's help.

This scene and others indicate how the same child, at this level of development, may sometimes work with materials in a wholly playful, personal way, while at other times he/she can consistently sort on a clear basis. Both forms of child behavior--playfulness and patterned sorting--should be encouraged, according to the child's decision and interest. Again, the strategy of flexibility is stressed, so that you respond to the child appropriately.

In this scene, emphasizing language labels, the student teacher suggests sorting in a different way, and then helps the child to sort on the basis of "thick" and "thin."

Note that it is all too easy to convey such a "right-wrong" stance to a child that the child indicates a need to know the "right" answer. You may work with children who have already internalized such a "right-wrong" view. The trouble with this stance is that it inhibits children from saying what they really think. And what they really think is what the teacher needs to know in order to figure out appropriate teaching strategies. It is said that many children learn to "read" the teacher--that is, to figure out what the teacher expects the child to say, instead of figuring out their own answers and verbalizing their own thinking.

Note that gentle probes help a child to be more precise and clear in verbalizing.

Activity 2

When the child has worked with materials and sorted them, it is not always evident just what is in the child's mind. One way to find out is to ask the child. Another way is to test his understanding by asking him to apply his sorting skill to a different base, or to a multiple base, to see what he can do. While some children are more verbal than others, verbalizing what one has just done is excellent practice in communicating one's ideas and making evident one's understanding.

In attempts to elicit verbalization, teachers often find

that children's concepts are in advance of their vocabulary. At an age when most children readily label most colors, teachers find that few children can label "grey," which is often seen by people as an absence of color. One child, fingering a corner of a rectangle and finding no word for it, labeled it a "down-and-around" and had no further difficulty explaining her sorting base. As the teacher added the more conventional term "corner," the child picked it up and quickly used it correctly. Some children seem able to <u>do</u> but not to <u>say</u>. Teacher verbalizations in such cases may provide models the children need in order to develop more articulateness.

In the following written protocol, you will find examples both of children's attempts to verbalize their actions and teachers' attempts to elicit verbalizations from children. Read through the protocol once; then mark the blanks or answer the questions according to the instructions given. Remember that the numbered blanks in the margin follow the appropriate descriptions or pieces of dialogue.

<u>A.</u> 1. A first-grade child explored attribute blocks very playfully, constructing a house with them and talking about building a plane. 2. The child appeared to have no clear base for sorting as she stacked blocks, built a wall with them, and handled them continuously. 1.____ 2.____

3. Attempts to elicit verbalization about her sorting base resulted in the child's offering such explanations as "It

looks like a rocket and that looks like a second rocket." 3.____

4. Changing from the attribute blocks, with which verbalization about sorting was unsuccessful, to the "people pieces" in this set, the teacher said, "Let's try something else." 5. Asked by the teacher why she was sorting the people pieces in the way that she was grouping them, the child accurately noted that she was sorting into two piles, red pieces and blue pieces. 4.____ 5.____

B. 6. The kindergarten teacher gave a child a collection of pattern blocks and three trays, asking, "How can you separate these? 7. The child sorted the objects. 8. Then the teacher asked her to label the objects, saying, "What are those?" 9. The child replied first "circles," then "squares," then "triangles." 6.____ 7.____ 8.____ 9.____

10. When the teacher removed one tray and asked, "Can you do it another way?" the child sorted into two trays. 11. Asked by the teacher, "What do you have in here?" the child correctly responded, "These are yellow ones and these are green." 10.____ 11.____

C. 12. A five-year-old was sorting the "people pieces" of the attribute blocks, and the child appeared to be constructing family groups. 13. Asked by the teacher, "How come these go together? Is there something the same about them?" the child said, "They got two babies." 14. The teacher continued her questions: "Is there another reason they're together?" 15. The child said, "They're married." 16. The teacher persisted, "Something has to be the same to be a family. Can you tell me what's the same?" 17. The child finally verbalized her sorting base: "These are skinny people, and those are fat people." 12.____ 13.____ 14.____ 15.____ 16.____ 17.____

D. 18. Working on sorting a button collection, the second-grade-teacher offered a child a magnet, saying, "What can you do with this?" 19. As the child tried out the magnet in many different ways, the teacher asked about a group of buttons the child had tried unsuccessfully to pick up with the magnet: "What about these buttons?" 20. The child replied, "These are plastic," without describing the results of her experiments. 21. The teacher said, "So the magnet doesn't pick up plastic."

18._____

19._____

20._____

21._____

1. Check in red pen or pencil the numbers of those items in which the child's initial fanciful verbalization was accepted, followed by more factual statements about the sorting base.
   Enter here the numbers checked:

2. Check in blue pen or pencil the numbers of those items in which the teacher's open-ended questions or comments led successfully to the child's verbalization of a sorting base. (Include the numbers of both the teacher's comments and the child's responses.)
   Enter here the numbers checked:

3. Check in green pen or pencil the numbers of those items in which the teacher modeled a verbalization about the child's sorting.
   Enter here the numbers checked:

4. List five additional ways the teacher could elicit verbalization from a child:

When you have finished, turn to page 71 of the Appendix to check your answers. If you made more than three errors, repeat this activity. If not, go on to Activity 3.

Activity 3

For this activity, select and complete two or more of the readings listed on page 74 of the Appendix, and then answer the questions that follow. Check your answers on page 71 of the Appendix. If you had no incorrect answers, go on to Element IV. If any of your answers were incorrect, either reread some of this material or choose another reading selection and try the questions again. You may also want to refer to some of the other selections to clarify any questions you were unsure of.

Self-check

Check the best answer for each numbered item.

1. If a child makes an erroneous statement about his sorting,

____a. the teacher ignores it.

____b. the teacher asks further questions, preferably open-ended.

____c. the teacher corrects the statement without being punitive.

____d. the teacher requires the child to repeat a corrected statement.

2. If the child indicates he doesn't know how to verbalize his sorting,

____a. the teacher calls another child to compete with him.

____b. the teacher suggests two children work together and discuss their sorting.

____c. the teacher reassures the child that he will eventually learn.

____d. the teacher tells him what to say.

3. If a child lacks the name of something, such as the word corner or edge, to describe a shape,

____a. the teacher supplies it matter-of-factly.

____b. the child is asked to guess.

____c. the teacher chastises the child for forgetting.

____d. the teacher changes the materials.

4. If the child's verbalization indicates full comprehension,

____a. the teacher knows the child understands.

____b. the teacher probes gently to find out whether there is, in fact, full comprehension.

____c. the teacher asks the child to tell the whole class what he said.

____d. the teacher gives the child a gold star.

ELEMENT IV

Objective:

Given a child sorting or classifying a set of materials, you will be able to help him make some progress toward either stating the rules underlying his sorting problem or formulating a more complex sorting problem.

Activity 1

For the final element of this module, you are to begin by viewing again the last portion of the videotape. As before, start by reading the following notes on the techniques and strategies you will see demonstrated. After viewing the tape, go on to Activity 2.

This part of the videotape deals with helping the child to stretch his understandings or to acquire new ones. Strategies found very helpful here include guided discovery, creating cognitive dissonance, and rule-making.

The first scene is an example of guided discovery. The student teacher is requesting the child to find examples of objects which she describes on 4 different variables. She says, "May I have a big, blue, thin, circle?"

or a small, blue, thick circle.

or a big, yellow, thick circle.

or a small, blue, thick square.

Note that the child has to select the object on all four bases--that is, size (small or big), color (blue or yellow), thickness (thick or thin), and shape (circle or square). At first, the child seems to note only one or two bases, and the student teacher repeats the ones ignored. Gradually, guided verbally by the teacher (for example, "Is that a square or a circle?") the child begins to demonstrate some success. It seems apparent that the child's increasing success indicates pr gress toward conceptualizing a multiple-base sort, though stability in such progress may take longer to achieve.

The second scene also demonstrates guided discovery strategies. Asking the child, "Why did you put these buttons together?" required the child to examine the buttons more closely and discover their physical characteristics more precisely. Note that, in response to this verbal request, the child discovers that some buttons have "points" (shanks).

The third scene is another example of guided discovery. The student teacher says, "If I put some pieces on this tray, can you put some on the other tray?" Since the student teacher has selected a sorting base without telling the child what it is, in effect the child is being guided to discover the base by selecting objects which have characteristics

different from those on the student teacher's tray. The student teacher initiates an attempt at further guided discovery by asking, "If I give you another tray (that is, three trays instead of two), what would you put on it?" However, the child is engrossed in her playful explorations and responds "I'm not finished." The student teacher, appropriately, retreats, again demonstrating flexibility in changing strategies.

While no examples of cognitive dissonance or rule-making are clearly shown here such examples did occur in the videotaping. When a child sorted by color--that is, red, yellow, and green--but did not verbalize this base, the student teacher placed a yellow object on the red tray and asked, "Does this yellow circle belong here?" Since the child had placed objects by color, the dissonance caused by confusing the colors helped the child to become aware of the base and to be able to reject items which did not belong to the base. This child was able to say, "No, only red things go here." His statement of the rule made the sorting base more explicit, conscious, and should help him to remember the base another time.

Activity 2

Putting children in touch with materials and encouraging their playful exploration often results in their demonstrating a sorting activity which they can readily describe. Children tend to repeat such activities. Often, a child who has demonstrated such repetitive activity abandons the materials from boredom, because it is not obvious how else they can be manipulated or how challenging they might become.

If children are encouraged to work together in pairs, or in small groups, some forward movement in sorting may occur as they exchange ideas or begin to find new possibilities together. Additional forward movement is often achieved through the unique function of a teacher who can pose or formulate problems which are different, and usually more complex, than children pose for themselves or for each other. If children respond negatively to such problem formulation, it may be the wrong time or the wrong place or the wrong materials.

In most cases, where the teacher-child relationship is good, the child is eager to work on problems which are formulated by the teacher, or by the child himself, as he matches wits with himself, competing with no one but enjoying the situation which helps him to structure his concepts and to organize his understandings in clearer or more mature forms than before.

Since formulating problems follows on considerable playful exploration of materials, on varying forms of exploration, and on the verbalization of understandings, the teacher now has had enough

experience with the child to know where a challenge might be placed so that it is neither too easy nor too difficult. But even if the teacher is able to determine the stage, according to Piagetian theory, at which the child appears to be operating, tentativeness is suggested in formulating a problem, so that the child's responses may be used to withdraw or reformulate the problem or change the materials.

Just as the child who has spent a whole morning in the block area may be surfeited with block play and therefore uninterested in assisting with block cleanup, the child who has been playing with the same set of materials for some time may desire a change in the objects he has been using before trying to solve new problems.

In these examples of the formulation of problems, mark the blanks in the margin or answer the questions according to the instructions given.

A. 1. The kindergarten teacher's button collection was quite large, and she encouraged a child to sort all the buttons in the collection. 1._____

2. The child had sorted in four boxes, clearly verbalizing the sorting base for three boxes as "red," "blue," and "white." 2._____

3. The fourth box was more difficult for the child to categorize. 3._____

4. The teacher suggested,"Here, you say this is a mixed group?" 4._____

5. But the child rejected her description, saying, "No, it's a color." 5._____

6. The teacher pointed to each of the other three boxes,

asking, "If you were to add something here, what color would it be?" 6.____

7. The child correctly named the colors for the three boses. 8. But 7.____
for the fourth box, he hedged with, "different kinds of buttons." 8.____

9. "What colors?" the teacher pressed him. 10. The child finally 9.____
said, "black and white." 10.____

11. Referring to the fourth box, the teacher asked, "Do all these buttons belong to this group?" 12. The child said, 11.____
"No, every button is different. These are black ones. These are white ones. These black ones are different from the others. These black ones are not." 12.____

13. "If we wanted to make this box into different groups, how many groups would we have?" the teacher asked, changing the problem to sub-grouping the fourth group. 14. The child reflected on this a 13.____
bit. 15. Then he said, gesturing with his hands on the table, "Maybe 14.____
we could make a line--for all the black ones. Then we could make a white line of big buttons here--and a blue line of small buttons." 15.____

16. "Try it," the teacher said. 17. The child responded by 16.____
arranging rows of buttons, subgrouping "black," "white," and "small." 18. He was unconcerned about the overlap between "small," 17.____
"black," "white." 18.____

B. 19. The prekindergarten teacher sat on the floor with a little girl. 20. Before them was a mat on which was drawn a large 19.____
circle and a square. 21. "Feel these with your hand," the teacher 20.____
urged, helping the child to run her finger around the circle's circumference, then around the square's perimeter. 21.____

22. A playful period followed in which the child drew

geometric-shaped pieces of wood out of a bag and placed them either in the circle or in the square. 23. The teacher drew the child's attention to the different colors of the painted wood shapes and to the size differences, "big" and "small," as well as the differences between "thick" and "thin" objects. 22.____ 23.____

24. Finally, the teacher said playfully, "See if you can find me a large red circle--a large red circle." 25. The child picked up an object, and the teacher said, "A circle." 26. The child put the object back and picked up another. 27. Again, the teacher said, "Not a small one. A large red circle." The child handed the teacher a large red circle. 24.____ 25.____ 26.____ 27.____

C. 28. The first-grade teacher, after several days of brief playful sessions with one child, using pattern blocks, suggested a new arrange. 29. "This time," said the teacher, "will you put all the green things in this loop and all the triangles in the other loop." 28.____ 29.____

30. The child accepted the task and worked to make the requested arrangement. 31. The child placed all the triangles, except the green ones, together, and all the green objects were placed in the second loop. 30.____ 31.____

32. "Are all the triangles together?" the teacher asked. 32.____

33. "Yes," the child responded. 34. "Let's see, these are all triangles in this loop. 35. That means you should have no triangles in the other loop. Right?" said the teacher. 33.____ 34.____ 35.____

36. The child looked puzzled. 37. She transferred the green triangles to the loop with triangles, hesitated, put them 36.____

back in the loop of green things. 37.____

38. "What's the problem?" asked the teacher. 38.____

39. "That's silly," the child giggled. "Maybe I need two sets of green triangles--one for each loop." 39.____

40. "Why?" asked the teacher. 40.____

41. "Because they belong in both places," the child said. 41.____

42. "Perhaps we can find a way to do that," the teacher suggested. 42.____

43. "I know," the child said triumphantly, "this way." 43.____

She placed the loops closer, so that they touched. 45. She placed 44.____

the green triangles across both loops. 45.____

1. Check in red pen or pencil the numbers of those items which are examples of problems formulated by the teacher.

   Enter here the numbers checked:

2. Give an example of a problem which might have been formulated in each of the sections - A, B, and C - of the preceding protocol.

3. Indicate for the child behavior described in sections A, B and C, your hunch as to each child's developmental level:

   A.

   B.

   C.

When you have finished, turn to page 72 of the Appendix to check your answers. If you made more than three errors, repeat this activity. If not, go on to Activity 3.

Activity 3

Again, you are to complete two or more of the reading selections listed on page 74 of the Appendix and then answer the questions that follow. Check your answers on page 72 of the Appendix. If you had eight or more correct, go on to the optional activities, beginning on page 52. If fewer than eight of your answers were correct, either reread some of this material or choose another reading selection and try the questions again. You may also want to refer to some of the other selections to clarify any questions you were unsure of.

Complete each of the following sentences.

1. If a child has found a consistent way to sort a collection of materials into two piles,_____ _____

_____

_____

2. An example of a multiple base for sorting is_____

_____

_____

3. An example of a shift in sorting base is_____

_____

_____

4. An example of a hierarchy in classification is _____

_____

_____

5. A Venn diagram may be an example of _____

_____

_____

6. A "some" - "all" sorting problem is _____

_____

_____

7. An example of creating cognitive dissonance is _____

_____

_____

8. An example of rule-making is _____

_____

_____

9. An example of guided discovery is _____

_____

_____

10. If a child completes a consistent sorting with one collection of materials, offering him a different set of materials may help him _____

_____

_____

OPTIONAL ACTIVITIES

Now that you have completed the required activities in Elements I-IV, you should be ready to integrate the objectives of these elements into a composite teaching pattern. To help you synthesize these objectives, you are to complete at least one of the following activities:

a. Audiotape lecture

b. Seminar

c. Role-playing

d. Peer-group discussion

You may, of course, do two, three, or all four of these activities if you like. Upon successful completion of this section, you will be ready for the post-assessment.

Activity A

For this activity, listen first to Side A then to Side B of the audio cassette that accompanies this module. It contains a talk by Professor Helen Robison, the module author, on developing the teaching skills presented in Elements I-IV. Before listening to the tape, read the following outline of the points covered on Side A. You may also want to refer to this outline as you listen.

I. Involve the Child with Materials

Suggestions are made for many ways to involve the child with materials in order to expand his repertoire of the great variety of physical characteristics of objects. Teacher strategies include the following:

A. Little teacher guidance.

B. Gradual teacher guidance.

C. Collaboration with the child.

The more kinds of experiences the child has with objects, the more understanding of and information about the physical world he has to draw on when he sorts and classifies objects.

II. Stages in Teaching Skill Development

A. Work with one skill at a time

B. Develop flexibility as a major teaching strategy.

III. Working with Children

A. Work with "easier" child at first.

B. Work with more "difficult" child next.

C. Work with more than one child next.

D. Help children to work with each other.

E. Work in pairs with another student teacher.

F. Avoid didactics, reinforcement and punishment, judgmental responses.

When you have finished listening to Side A of the audio cassette, check your understanding by answering the following questions. You may listen to the tape as often as you feel is necessary ahead of time.

1. List ten kinds of involvement with materials that will help a child build a repertoire of understandings about the physical characteristics of objects.

a)

b)

c)

d)

e)

f)

g)

h)

i)

j)

2. List three major ways that a teacher can guide a child's involvement with materials.

a)

b)

c)

3. List ten activities that will enable a teacher to collaborate with a child in exploring objects.

a)

b)

c)

d)

e)

f)

g)

h)

i)

j)

4. List the major forms of teaching behaviors to <u>avoid</u> in involving a child with materials.

a)

b)

c)

d)

Check your answers to the questions above by replaying Side A of the audio cassette. If more than six of your answers were incorrect or incomplete, listen to Side A and try the questions again. If not, go on to Side B.

When you have finished listening to Side B of the audio cassette, check your understanding by answering the following questions. You may listen to the tape as often as you feel is necessary ahead of time.

1. Give an example of each of the following strategies used in eliciting verbalization:

   a. flexibility

   b. gentle probe

   c. precision in questioning

2. Define guided discovery.

3. List three strategies suggested for guiding discovery.

   a.

   b.

   c.

4. Give an example of guided discovery.

5. Define cognitive dissonance.

6. Give an example of cognitive dissonance.

7. The most important cautions about rule-making, as stated here, are

a.

b.

c.

Check your answers to the questions above by replaying Side B of the audio cassette. If more than three of your answers were incorrect or incomplete, try Activity B, C, or D instead. If not, go on to the post-assessment.

Activity B

This activity is a seminar that is to meet with your course instructor and three to eight other students who are also taking this module. Select a date when you can all meet for at least an hour. Each of you should prepare a written report (one or two pages) describing problems you have encountered so far in your work with classification skills or experiences you have had that illustrate or clarify points made in this module. Your student teaching should be a rich source of material for this seminar. Submit your reports to your instructor several days in advance so that he/she can help organize the seminars according to common problems and interests.

At the seminar, each of you should present your report to the rest of the group. Allow time to discuss the reports and answer questions. If your instructor and the other students in your group agree that--through your report and your participation in the discussion--you have demonstrated an understanding of the objectives of this module, you may go on to the post-assessment. If not, complete Activity A, C or D instead.

Activity C

This is a role-playing activity. Arrange to meet with a group of four or five other students who are also taking this module. Each of you should prepare collections of materials that can be used for sorting and classifying. Working in pairs, and taking turns so that both members of the pair have a chance to role-play the teacher, present your materials to the student playing the child. Keep in mind the strategies and techniques demonstrated on the videotape and in the written protocols.

One pair at a time should role-play this simulated classroom situation, while the rest of the group observes and gives feedback to the role-play participants. The group should evaluate each pair's performance, using the following questions as a guide:

1. What were the "teacher's" goals? That is, what motivated each of his/her actions and statements in the interaction with the "child"?

2. How did the "child" perceive the "teacher"? Do these perceptions correspond to the "teacher's" idea of what he or she was doing?

3. How did the rest of the group perceive the interaction? Do their perceptions correspond to those of the "teacher"? to those of the child?

Continue the role-plays until the group feels that each of you has--in the role of the teacher--succeeded in involving the "child" with the materials in a ways that will lead him to explore the materials further on his own, eliciting verbalizations, and making progress toward the formulation of a problem. If you have trouble meeting these goals, try Activity A, B, or D instead. If not, go on to the post-assessment.

Activity D

This activity provides a follow-up to the work you've done so far. Arrange to meet for an hour-long discussion with a group of three to eight other students who are also taking this module. (You should meet without your instructor). As preparation, review Elements I-IV. Your discussion should focus on your interpretation of the skills presented in these activities. You can use the following questions as a guide:

Element I

1. What are some of the factors that will influence a child's involvement with materials?

2. What are some of the ways in which the teacher can guide a child directly? (Add your own examples to those given on the videotape and in the written protocols.)

3. What are some of the ways in which the teacher can guide a child indirectly? (Add your own examples to those given on the videotape and in the written protocols.)

4. What are some of the things a child can discover in free exploration of materials?

Element II

1. Why is flexibility important when the teacher is trying to stimulate further exploration of the materials?

2. What are some of the ways a teacher can help a child make a fresh start in exploring sorting possibilities?

3. What are some of the ways in which a teacher can encourage sensory exploration of the materials?

4. What equipment should the teacher have ready in addition to sorting materials? What use can be made of this equipment?

Element III

1. What are the reasons for eliciting the child's verbalizations about his sorting activities?

2. What are some of the reasons a child may be unable to talk about what he is doing?

3. What teacher behaviors should be avoided when helping the child to verbalize? What teacher behaviors can be effective?

4. When is teacher verbalization appropriate?

Element IV

1. What are the reasons for helping a child to formulate a problem based on his sorting activities?

2. What are some strategies a teacher can use in formulating problems? Give examples of each one.

3. Why might a child respond negatively to problem formulation? What can the teacher do to counteract this response?

4. In what ways does problem-formulation depend on the techniques discussed earlier in this module--involvement with materials, exploration of materials, and verbalization?

When the group agrees that you have succeeded in clarifying the material presented in Elements I-IV, you may go on to the post-assessment. If the group still has unanswered questions, or if some points need further clarification, confer as a group with your instructor. He may recommend that you complete Activity A, B, or C in addition to this one before moving on to the post-assessment.

POST-ASSESSMENT

The post-assessment consists of two sections. The first is a self-check that covers the techniques and behaviors presented on the videotape accompanying this module. The second section is a mastery test, a practical check of how well you are able to implement these techniques and behaviors yourself.

A. Self-check

Place a check next to each of the following teaching performances that is in harmony with those presented on the videotape accompanying this module. When you have finished, check your answers on page 73 of the Appendix. Then go on to section B, the mastery test.

_____1. Tell the child he's lazy and unwilling to work.

_____2. Praise the child effusively.

_____3. Be acceptant by posture and facial expression.

_____4. Pace the child as rapidly as possible.

_____5. Correct every error as the child makes it.

_____6. Tell the child the answer when he hesitates.

_____7. Let the child set the pace.

_____8. Phrase questions open-endedly whenever possible.

_____9. Reinforce the child's answer by praise.

____10. Omit reinforcing statements, assuming the child enjoys the activity.

____11. Be passive, observe the child, and avoid asking questions.

____12. Work with a whole class.

____13. Let two children compete.

____14. Give a child a gold star for effort.

____15. Tell the child the answer, so he will be able to repeat it.

____16. Observe the child's use of the materials before structuring.

____17. Accept errors but probe the child's actions gently.

____18. Use cognitive dissonance techniques to help a child recognize an error.

____19. Give a child a rule to follow before he sorts, to insure success.

____20. Avoid rule-making unless the child's sorting indicates that he is using a rule.

____21. Assume that free play without adult interference constitutes the best teaching.

____22. Use guided discovery techniques to help a child clarify his sorting base, shift his sorting base, or try to sort on a multiple base.

____23. If the child becomes playful during sorting, discourage the playfulness.

B. Mastery Test

In order to complete the mastery test, you will have to arrange to videotape a ten-to-fifteen-minute session in which you work with a child, using materials that can be sorted or classified in some way. Check with the classroom teacher before you make your arrangements, and try to select a place where the noise level is low and where there is little likelihood of interruption.

Select a child you know well from your student teaching or from your field practice in this module. Make sure he or she is someone you can work with easily, as well as someone who will not be distracted too much by the presence of the video camera and microphone.

Before you begin, read the additional description of teaching skills beginning on page 75 of the Appendix and look at the checklist of teacher and child behaviors on pages 66-69, so that you will know what the mastery test is designed to demonstrate.

Write a lesson plan for your videotape sample, including a behavioral objective, a list of materials to be used, teaching skills to practice, and possible sequencing of problems to formulate.

View your completed videotape right away and if the tape is too faulty technically for a proper evaluation of your performance, arrange to make a second videotape as soon as possible. When you have a satisfactory videotape, arrange for you and your instructor to each view it separately, coding your performance according to the checklist of behaviors on pages 66-69. Then meet with your instructor to compare your evaluations of the mastery test and decide whether

you have successfully completed this module or need additional work in some areas. The additional description of teaching skills in the Appendix may help you both evaluate your performance and decide how your skills can be improved further.

CHECKLIST OF TEACHER AND CHILD BEHAVIORS

Note: In the blank space beside each item, code as follows: 1--satisfactory; 2--needs improvement; 3--irrelevant.

TEACHER BEHAVIORS	CHILD BEHAVIORS
I. Involving the child with materials:	I. The child is involved with materials in exploratory behavior:
____1. Selection of materials.	____1. Playfulness.
____2. Change of materials.	____2. Purposefulness.
____3. Manipulation of materials.	____3. Interest.
____4. Management of materials.	
____5. Verbalization.	
II. Stimulating explorations of more variety:	II. The child makes more varied explorations:
____6. Use of materials.	____4. Non-perseveration.
____7. Pace.	____5. Perseverance.
____8. Nonverbal behavior-encouraging.	____6. Different manipulations.

_____9. Clarity of verbalization.

_____10. Open-endedness.

_____11. Avoidance of punitiveness.

_____12. Avoidance of didactics.

_____13. Avoidance of judgmental statements.

_____14. Appropriateness of verbalization.

III. Eliciting the child's verbalizations:

_____15. Clarity.

_____16. Gentle probes or challenge.

_____17. Pace.

_____18. Appropriateness.

_____19. Positive, acceptant behavior.

IV. Formulating or eliciting a problem:

_____20. Clarification of sorting base.

_____21. Shifting the sorting base.

_____22. Shifting to a multiple base.

_____7. Active involvement.

III. The child verbalizes his perceptions of the sorting variables:

_____8. The child responds to queries in his own words.

_____9. The child is spontaneous, responsive.

IV. The child manipulates materials in additional ways to solve a problem:

___ _10. The child works to solve a problem.

(Continued)

TEACHER BEHAVIORS	CHILD BEHAVIORS
V. Quality of teacher stimulation:	V. The child's exploratory behavior is involved, persistent:
_____23. Warmth of relationship or rapport.	_____11. Child indicates willingness to continue another time.
_____24. Intellectual level significant, non-trivial.	_____12. Child appears to be challenged at top of capacity.
_____25. Appropriateness of challenge.	

On a separate sheet of paper, write a brief explanation for each item coded 2.

APPENDIX

A. Answer Key

Element I, Activity 2

1. 2, 3, 7, 14, 16, 31, 38
2. 2
3. 5, 6, 7, 28, 29, 33
4. 17, 18, 19, 20, 21, 22, 23, 24, 35, 36, 37
5. 35, 36, 37
6. 12, 15, 18, 19, 21, 35, 36
7. 30

Element I, Activity 3

You should have checked items 1, 2, 5, 6, and 8.

Element II, Activity 2

1. Nos. 2, 3, 6, 8, 21, 23, 25
2. Nos. 16, 17, 21, 25
3. Nos. 5, 12, 14, 16, 24
4. Some additional ways to stimulate more varied explorations include:

   Offer a container of water and ask for ways to use it with the objects.

   Offer a balance beam and ask the child to see how it works.

   Offer the child a collection of magnets of different sizes and shapes.

   Offer the child two boxes, one with a small aperture in the cover, the other with a large one.

   Offer a produce scale or a bathroom scale.

   Offer a yardstick and some 12-inch rulers.

Invite one or two children to play and to suggest their ideas.

Invite child to sort objects while blindfolded.

Invite child to sort objects concealed from view, without a blindfold.

Rig up a fan, either hand-powered or electric-powered.

Element II, Activity 3

Possible completions, among others, are:

1. Floating vs. sinking; floating, sinking, and half-in, half-out of water; objects which absorb water vs. objects which do not; objects which absorb some water, objects which absorb a great deal of water, and objects which do not absorb water.

2. Attraction vs. no attraction; attraction at any point, attraction at some points, attraction at no points on object.

3. Rolling vs. non-rolling; rolling short distances, rolling longer distances, no rolling.

4. Sweet, sour, salty, bitter (but tasting varies!); hard, soft; hard, medium, soft; melting, non-melting; liquid, solid, mush.

5. Liquid, solid; melts, does not melt; cold, warm, hot; thickens, does not thicken; vegetable, fruit, meat.

6. Hard wood, soft wood; thick, thin; long, mdeium short; nails with wide head, mails with narrow head; bent nails, straight nails; geometric shape.

7. Loud and soft sounds; fast and slow music, regular beat and irregular beat (syncopation); single sound and multiple sound; sources of sound (human, objects, etc.).

8. Type of housing (high-rise, low-rise, single- or multiple-dwelling); types of vehicles in street (powered vs. non-powered, trucks, cars, etc.); types of workers observed (mailmen, street repair, vehicle drivers, etc.); types of stores observed.

9. Food vs. non-food items; varieties of food; varieties of non-food; types of packaging (bags, boxes, cans, bottles).

10. Types of kitchen equipment; types of cutlery , cooking pots, or dishes; types of clothing.

Element III, Activity 2

1. Nos. 3, 5

2. Nos. 4, 5, 6, 7, 8, 9, 11, 16, 17

3. Nos. 16, 21

4. Some additional options are:

   Ask the child to direct another child to copy his/her sorting groups.

   Ask the child to direct the teacher to copy his/her sort, and to explain to the teacher how to do it.

   Invite the child to record a description of his/her sorting on an audio cassette.

   Invite the child to leave the sorting work, draw a picture to show how the objects were sorted, and explain it to another child.

   Copy the child's sorting incorrectly and ask the child to explain what's wrong with it.

Element III, Activity 3

1. b

2. b

3. a

4. b

Element IV, Activity 2

1. Nos. 6, 9, 11, 13, 24, 25, 27, 29, 32, 35, 40 and 42.

2. In section A, the child could be asked to note that "small" buttons overlapped black and white, and he could be asked to find a way to show this.

In B, the child could have been asked to sub-group one variable by another--for example, color by size--or to sort first by one variable, then by another.

In C, the child could be asked to find other ways to demonstrate the overlapping characteristic.

3. A. Probably at an intuitive, preoperational level.

B. Probably at an earlier stage of intuitive, preoperational thinking.

C. Probably transitional, entering the beginning of concrete operational thinking.

Element IV, Activity 3

Possible completions, among others, are:

1. he may be challenged to find a way to sort into three (or four) piles.

2. large, green circles.

3. from color to shape.

4. sparrows are birds, birds are animals, animals are living things.

5. an overlapping sorting base.

6. If all of the beads are wooden, and some are white, are there more white beads or wooden beads?

7. If a child sorts objects into "large" and "small," cognitive dissonance could be created by introducing "middle-size" objects and placing them in either pile, then asking the child if they are

correctly sorted, or by giving the child "middle-size" objects and asking him to decide how to arrange them. Since the child has selected only two size attributes, the dissonance consists in the fact that a third size attribute is introduced that goes with neither or the two classes the child has created, thus requiring either the creation of another class--"middle-sized" or the redefinition of one of the two classes, such as "largest" and "small and middle-size."

8. all is always more than some of the same thing; or if an object belongs to two different piles at the same time, you can show it belongs to both.

9. If a child says he put all the yellow things in one box, but actually he put several yellow objects in another box, guided discovery would be asking him to take one yellow object and compare it to every object in each box in order to find out whether all yellow objects are actually in the same box.

10. to practice his sorting, to become more stable in his concepts.

Post-Assessment - Section A

You should have checked items 3, 7, 8, 10, 16, 17, 18, 20, and 22.

B. Readings

Aebli, Hans, "Piaget and Beyond," in Joe L. Frost, Revisiting Early Childhood Education, Readings, New York: Holt, Rinehart and Winston, 1973, pp. 166-182.

Chittenden, Edward A., "What is Learned and What is Taught," Young Children, Vol. 25, No. 1, October 1969, pp. 12-19.

Hammerman, Ann, and Morse, Susan, "Open Teaching; Piaget in the Classroom," Young Children, Vol. 28, No. 1, October 1972, pp. 41-54.

Kamii, Constance, "A Sketch of the Piaget-Derived Preschool Curriculum Developed by the Ypsilanti Early Education Program," in Samuel J. Braun and Esther P. Edwards, History and Theory of Early Childhood Education, Belmont, California: Wadsworth Publishing Co., 1972, pp. 295-312.

Kamii, Constance, "An Application of Piaget's Theory to the Conceptualization of a Preschool Curriculum," in Ronald Parker (Ed.), The Preschool in Action, Boston: Allyn and Bacon, 1972, pp. 91-129.

Lavatelli, C. S. "A Piaget-Derived Model for Compensatory Education," in J. L. Frost (Ed.), Early Childhood Education Rediscovered, New York: Holt, Rinehart and Winston, Inc., 1968, pp. 530-544.

Robison, Helen F. and Schwartz, Sydney L, Learning at an Early Age, A Programmed Text for Teachers, Vol. 1, New York: Appleton-Century-Crofts, 1972, pp. 247-313.

Robison, Helen F and Schwartz, Sydney L., Learning at an Early Age, Vol. 2, A Curriculum for Young Children, New York: Appleton-Century-Crofts, 1972, pp. 94-102, 146-164, 165-192, and 208-217.

C. Teaching Skills

1. Involve the Child in Active Manipulation of Objects

To involve children in exploratory activity with sorting materials, teaching activities include selection of materials, change of materials, and verbal and nonverbal suggestions for the manipulation of materials. Encouragement of playfulness is the best guarantee that the child will thoroughly explore the materials and that his own use of them will demonstrate the current level of his classificatory skills.

a. Selection. Most children are willing to work with any materials offered by a familiar, well-liked adult, where interesting, non-threatening activities are in prospect. But some materials are more attractive or stimulating to some children than to others. Several sets of materials should be collected and packaged for use. Avoid an overly large collection of items, which may be more than the child can manage. Materials must have three or more variables if they are to offer the young child some challenge and contain possibilities for solving new problems. Variables may be shape, color, size, texture, composition, or other attributes. Physical attributes are stressed, for younger children because the objects themselves can help the child to check sorting and classifying patterns. Collections may include buttons or such math materials as Attribute Blocks, Pattern Blocks,

or Logic Blocks. See the list of readings in the Appendix for more suggestions.

b. Change. If the child does not get involved with a selected set of objects, offer a change or give him his choice of other sets. However, verbal or nonverbal encouragement or suggestion may be necessary to get him involved.

c. Suggestion. Verbal suggestions may take such forms as

Would you empty this box on the table?

Would you hand some of those things to me?

Are there some things here that go together?

What can you do with these objects?

Here are some boxes. Can you put things that go together in each box?

Nonverbal suggestions may include fingering objects, moving them around the table playfully; taking objects out of the box, one at a time, and feeling them slowly; stacking objects or making constructions; spreading objects widely or compressing them narrowly; pushing one object with another; dropping objects gently into a container, one at a time.

Children's involvement with materials, and spontaneous or elicited sorting serves to indicate what sorting or classification skills they have readily available.

2. Elicit Increasingly Varied Exploration of Objects

a. Verbal suggestions might include the following:

How else could these objects go together?

If we add one more box, how would you sort these objects?

If we take one box away, how would you sort these objects?

Let's empty these boxes. Can you fill them a different way?

I'm going to put one more object in each box. Do they belong?

Close your eyes and feel the objects in this box. Can you put these things into two boxes instead of one?

Let's start all over. If I put these two objects in this box and these two in that box, can you sort the rest?

b. Nonverbal suggestions may include rolling some circular pieces; stacking a smaller object on top of a larger one; offering containers of different sizes; removing containers and offering jersey loops, string, yarn, shoelaces, or paper plates instead; offering additional equipment, such as a ramp, magnet, or balance scale, to suggest additional actions, explorations, and sorting possibilities.

3. Elicit Verbalization of More Complex Sorting Actions

If the child changes a sorting base successfully, or with some errors, but does not verbalize the new sorting base, he can be helped both to correct his own errors, and to become aware of his new sorting base, by such guided discovery techniques as the following:

a. Say something like, "This is different from the way you did it before. Let's see how these are the same. Tell me why these objects belong together. Are they all the same color? What colors are they?"

b. Help the child enumerate the attributes of each object he has placed in a group and compare the attributes of one object with another. For example, "This ball is blue and that one is read, you just told me. Why do you want them to go together?"

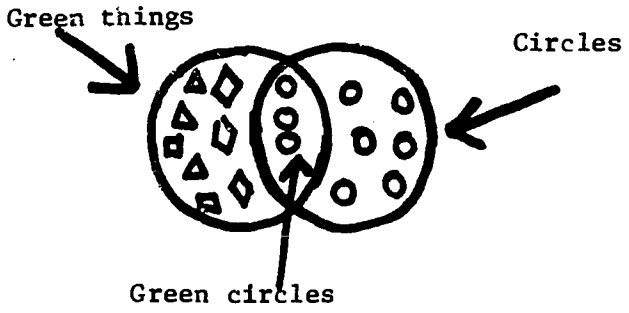
c. Point to the objects incorrectly sorted and help the child to find out how these are different from the other objects in the group.

d. Place an object incorrectly and ask the child to decide if it belongs, and why it does or does not. Emphasize inconsistent attributes, where an object is incorrectly placed. For example, "You said these buttons are all made of metal. Is this button made of metal? If it's not, does it belong here?"

Guided discovery techniques include teacher actions which help the child to make a discovery he is unable to make by himself. Guides by the teacher may include cues, labels, memory aids, the focusing of attention, and the suggestion of actions.

If the child appears to be attempting a multiple sorting base, without error, or with some error, continue

to use guided discovery. In this way, any discoveries the child makes become his own, even though he needs help to become conscious of his discovery or to reach stability in his discovery. If he begins to make a discovery that will enable him to verbalize the multiple sorting base, help him to make a rule statement if he can. For example, if the materials include some green circles and some green things that are not circles, and the child tries to sort all the green things in one pile and all the circles in another, he is likely to exhibit some confusion about where to put the green circles, since these in fact overlap both piles. If the child can be guided to discover that green circles overlap both piles, he can be helped to show this fact graphically. String, yarn, or jersey loops can be offered to the child to construct an overlapping sort, as in a Venn diagram:



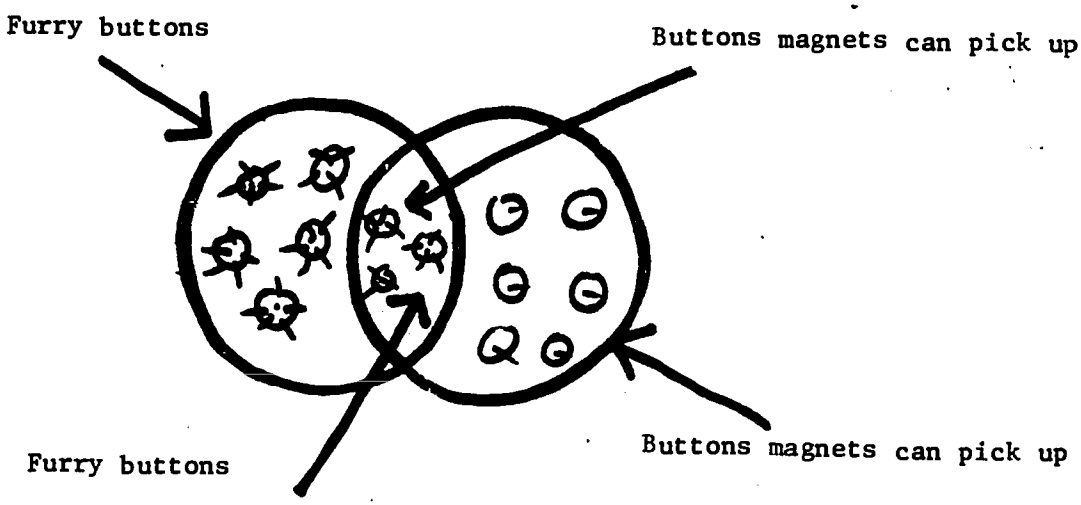
If the child can be guided to construct and understand an overlapping sort that is, that the same object belongs to two different classes at the same time he might be further guided to state a rule to the effect that if an

object belongs in two different piles and because it's part of one as much as it's part of the other, you have to show it's part of both piles (overlap). The rule should not be formulated for a child unless he is able to make such an overlap in some form, for example, by putting the overlapping objects on the edge between the two piles, or on a different plane, over the two piles. If at all possible the child should be led to formulate the rule by himself. If he cannot, he should be asked to apply the rule using a different sorting base and materials, in order to practice using the rule and to show clear understanding of it.

4. Formulate or Elicit a More Complex Sorting Problem to Solve

With young children in early childhood classes more complexity in the objects to be sorted and classified may be gained simply by changing the base for sorting (for example, from shape to color). However, if children are offered equipment with which to explore objects in more complex ways, unexpected or novel sorting bases may be discovered. For example, with a magnet, buttons may be sorted into metals and non-metals, and metals may be further sub-sorted into magnetic and non-magnetic metals. However, in one interesting button sort with magnets, children discovered additional sorting bases, such as buttons which magnets pick up every time, buttons which magnets only pick up from the bottom

(those with magnetic metal shanks), and buttons which magnets never pick up. A more complex problem was formulated for the child to sort all the "furry" buttons (synthetic fur) and all the buttons magnets can pick up in some way. This is an overlapping sort, since some "furry" buttons had magnetic metal shanks and therefore such buttons had to be sorted in a class which overlapped parts of both classes, as follows:



5. Elicit More Complex Sorting

This can be done by manipulation of the materials, attempts to solve an already stated problem, or attempts to state the rules governing the solution of a problem.

Guided discovery techniques, the creation of dissonance, and rule-making techniques can be used. Guiding discovery

of more complex sorting, as in simpler sorting, may involve labeling, the use of cues, recall of attributes, and attention focusing.

Avoiding perseveration (continuing fruitlessly to do the same thing) may be the main problem. Children who successfully complete a sorting on one base often find it difficult to "break set," to start afresh, to find a different sorting base. Similarly, when children try to solve a problem, they often make one unsuccessful try and then keep repeating the same unsuccessful try. To avoid perseveration, remind the child that there are other things he can do, and if necessary, specify them. One child kept trying to sort a four-color collection of objects into two piles, using only two of the four colors and failing to account for the other two. The teacher trainee reminded him that he had only two containers to sort into and more objects to be sorted. The child was also reminded that he could sort by feeling the objects (circles and squares), by closing his eyes and feeling the objects so he could forget about color, or by using a ramp to see how the objects might be the same or different.

Creating dissonance is an attempt to confront the child with a situation that does not fit his solution and which may force him to seek a better solution. For example, if he says that all metal pieces belong together because a magnet can pick them up, try giving him non-magnetic as

well as magnetic metal p. s, so that the results are dissonant with his ex. . .ions. If the child can perceive this dissonance, the situation may help him to make the more complex distinction between metals which magnets attract and those they do not.

Guiding children to rule statements--to verbalizations about their actions or solutions--can help them to remember how to proceed next time. For example, if the child sorting metal pieces found out that you have to use all the objects in the collection to complete a sorting or classifying problem, he might be encouraged to state his rule to the effect that if objects are left over and do not fit in with the sorted piles, either more piles are needed or a different base for sorting is needed. In the example of the four-color collection of circles and squares, where the child tried to sort by two of the four colors, he had objects left over which did not belong to either of the piles already sorted.

Generally, rule statements should be avoided where there is evidence that the child is either confused about the sorting problem or is not yet stable in his ability to handle the problem successfully. Giving a child a rule he does not understand may only cause confusion, or worse yet, it may arrest his continuing struggle to reach understanding.