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IDENTIFIERS   *Bereiter Engelmann; Distar

ABSTRACT
         This monograph, the fourth in a series pertaining to
the Early Childhood-Special Education Teacher Preparation Program at
the University of Virginia, describes the highly structured directive
teaching process. The foremost example of the directive teaching
process is the Bereiter-Englemann model which is geared toward
alleviating the language and conceptual deficits often observed in
disadvantaged children, by using a highly structured educational
environment. The seven major principles of learning and instruction
which underly this model are discussed. A description of how the
model functions in the overall program of language, reading,
arithmetic and music and a discussion of the presentation and
feedback strategies basic to this approach are included, along with
depiction of the interaction patterns which evolve from use of the
directive process. Module requirements and cognitive and skill
competencies to be acquired by the student are outlined. (ED)

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Directive Process

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Monograph IV

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THE DIRECTIVE TEACHING PROCESS

The highly structured directive process consists
primarily of a triad of events. An antecedent behavior of
the teacher (antecedent stimulus: S_a), followed by a pupil
response (R), which is reinforced or corrected by the
teacher (subsequent stimulus: S_s). For example, if the
teacher wants the child to learn the name of an object
(e.g. a block), she might show the child the block and
say, "This is a block. What is this?" (S_a), to which the
child might respond, "Block" (R), which the teacher could
reinforce with, "Yes, this is a block, Good talking!" (S_s)
(Kauffman, et al 1973)

In less directive teaching either the S_a or the S_s
variables is frequently emitted, making instructional
behavior predominantly dyadic. The teacher may reinforce
or correct spontaneously emitted response (R——Ss) or
prompt responses which she neither corrects nor reinforces
(Sa——R). For example, the child may find a block on the
table and emit the response "Block" (R), after which the
teacher may say, "Let's play with these blocks" and
present the child with various blocks (S_a), to which the
child responds by playing with the objects (R), which is
not followed by any teacher reaction.

Bereiter Engelmann Program

The foremost example of the directive process in

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American education is the Bereiter-Engelman Program
(1966). It is the most marked departure from the free-
play, "whole-child" model for early childhood education.
The program's expressed purpose is to increase the
probability of subsequent academic success for children
from disadvantaged circumstances. The curriculum is
geared toward alleviating the critical deficits often
observed to characterize disadvantaged children (i.e.,
deficits in language and specific concept development).
Bereiter and Engelmann feel that many underprivileged
children enter into formal schooling a year or more behind
in areas such as language and cognitive skills. Bereiter-
Engelmann also believe that these initially deficient
states can be ameliorated by a short-term, highly
structured intervention process where time is a most
precious commodity. Bereiter and Engelmann have included
in their rationale a currently popular view in develop-
mental psychology. This view states that the most
important role to be served in a child's development is
the active role served by the child himself, (White,
1959). The child needs certain equipment which will
stimulate the successful pursuit of self-development if
this active role is to be achieved. Children who lack
this equipment must be helped to acquire it. Bereiter-
Engelmann contend that the needed cognitive equipment can
be acquired most efficiently in a highly structured

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educatienal environment. Cognitive competence, in turn, prevides the basis fer such impertant affective character-istics as pesitive self-esteem and self-cenfidence. Language training prevides the basic substance of the program. This training is intended te strengthen the child's use ef language, particularly with respect te legical reasening. Language training is extended inte reading and arithmetic and is supplemented by music activities. Thus, the whele erientatien ef the pregram is cegnitive. The pregram is implicitly feunded, en a strict applicatien ef stimulus respense learning theery.

Principles ei learning and instructien. Few assump-tiens are made abeut the nature ef childheed and/er metivatien in the Bereiter-Engelmann pregram. It is recegnized that all children have a eapacity te learn and that, in the case ef disadvantaged children, learning preblems are induced primarily by the envirenment, i.e. an eutgrewth ef faulty learning experiences. Therefere, learning preblems can be evercome under the preper envirenmental circumatances.

Implicit in the design ef the learning activities is the belief that children seek te master their ewn enviren-ment. Werds, sengs, games and subtle ferms ef cempetitien ("Here's a hard one----I'll bet I'll trick yeu with this one.") are used te metivate and appeal te yeung children.

Evans (1971) lists seven major Bereiter-Engelmann

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principles of learning and instruction:

1. <u>Behavioral objectives</u> - The Bereiter-Engelmann curriculum is unsurpassed as an instructional program in clearly indicating the terminal behaviors it attempts to produce. The Bereiter-Engelmann program gives a detailed accounting of the skills it believes are required of children for academic success in the preschool and primary grades (15 skills in total). These skills are broken down into responses which may be directly observed and measured. All skills are stated in terms of observable behaviors (e.g., "The child will be able to name the basic colors, plus white, black, and brown.") They also provide functional cues for the planning of instructional activities and more importantly they clearly indicated to the learner what he is supposed to be learning.

2. <u>Homogeneous Grouping</u> - Children in the Bereiter -Engelmann program, theoretically all four years of age when they enter the program, are placed in small groups of approximately five members each according to demonstrated ability. The rationale for homogeneous grouping is this: "by reducing heterogeneity with respect to such variables as learning rate and conceptual repertoire; instruction may be streamlined, pacing geared appropriate-

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ly, and frustration levels reduced". (Evans, 1971)
The very directive and convergent tasks presented
to the children by the Bereiter-Engelmann curricul-
um-make this grouping a reasonable procedure. It
can not be overlooked, however, that ability
grouping is not without its disadvantages, includ-
ing the danger of typecasting a child with lower
ability.

3. Active Involvement - Children in the Bereiter-
Engelmann program are constantly making active
responses with a great deal of emphasis on repeti-
tive verbalizations. Both unison responses and
frequent individual responses are encouraged
within the small group interaction. A random-order
recitation strategy (versus fixed order where
children knew in advance when they'll be called
upon) is requested and the motivational value of
this strategy is supported by empirical research
(Hudgins and Gore, 1966).

4. Immediate Feedback.- A recitation mode of
instruction establishes one of the most important
conditions of learning: immediate feedback (Gagne,
1965). The children in the Bereiter-Engelmann
program constantly receive knowledge of the results
of their actions. This type of reinforcement has
two values: The first value is motivational - i.e.

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by responding to material structured to reduce
error rate, the child may experience the success so
necessary for the development of achievement
motivation. The second value is informational in
that when errors are made specific and unambiguous
feedback from the teacher may indicate why a
response was incorrect. Reward strategies are
stressed for purposes of maintaining rapport and
pupil motivation. Teachers are to reward effort,
task-involvement (versus play motives), group
cohesiveness and cooperation. Shaming, coaxing,
and derogation are to be avoided. Rewards include
both tangible (cookies, raisins, game privileges)
and social rewards (praise and recognition).
Bereiter and Engelmann, however, feel the real
rewards for children will emanate from their newly
learned skills. Disciplinary techniques include
moderate physical punishment and social isolation
(time-out).

5. Graduated Sequence - Language, reading and
arithmetic activities are combined into a sequen-
tially programmed curriculum which progresses from
simple to complex. The sequence is essentially
logical, based on conceptual hierarchies and
linguistic structure.

6. Transfer - The ultimate objective of the

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Bereiter-Engelmann program is the concept of
"transfer of learning." Transfer ability refers to
the influence that learning which occurs at one
point in time will have on subsequent learning or
performance. In theory, the Bereiter-Engelmann
curriculum is designed to increase the probability
that mastery of its basic concepts will make future
schoolmlearning more efficient and effective. (It
must be pointed out that the transfer effects of
the Bereiter-Engelmann program are not clear to
date.) It is important to note also that the
primary Bereiter-Engelmann emphasis is upon the
learning of skills which will facilitate the
learning of successively more complex material
within conceptual systems, Gagne's "vertical
transfer" (1965).

7. Criterion reference testing (Glaser, 1963) -
Criterion reference is a form of assessment which
attempts to evaluate instruction where the intent
is to create a specific level of skill proficiency
among children. In other words, if instruction is
administered for the purpose of promoting among all
children the achievement of particular goals, it
follows that assessment procedures should provide
evidence of the validity of instructional proce-
dures (Evans, 1971). Either a child has attained

the objective or he has not. If he has, mastery
has occurred. If he has not, procedures must be
redesigned. Children are not ranked or compared to
each other. Rather their point of reference is the
criterion established by a given instructional
objective.

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Overall Program

Language curriculum. The Bereiter-Engelmann language curriculum is composed of an integrated set of basic concepts, sentence forms, and presentation strategies. Bereiter and Engelmann maintain that children must totally understand that language is a symbolic substitution for physical reality. For example, a child must learn that the expression, "Two balls are on the table", has a concrete referent which may be observed or created. The child, through language, is also provided with an independent check on the accuracy of his observations. For this reason, statements of fact represent the key element of the Bereiter-Engelmann teaching language (Bereiter and Engelmann, 1966).

Bereiter-Engelmann have developed a model for presentation strategies which has as its components the statement and the second-order statement, which modifies or expands the identity statement. Combined, these two statement forms possess the capacity to teach the basic concepts of the language program.

The identity statement provides the symbolic representation of an object: "This is a(n) _____." (e.g., "This is a block.") The second-order statement permits the further expansion and specification of concept attributes:

"This _____ is _____." (e.g., "This block

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is blue.")

Further variations of these statement forms are presented once the two basic forms are mastered. These variations allow for differential subject-predicate placement. Such variations include polar concepts (such as hot-cold, hard-soft), non-polar concepts, which pertain only to members of an identity class (e.g., "This ball is blue"). Where the attribute color is nonpolar and other members of the class concept "ball" may differ in color and non-polar concepts that represent a property shared by all members of a concept class (e.g., "This ball is a toy.").

The children in the Bereiter-Engelmann program learn how to identify, label correctly, and classify common objects in the environment. Bereiter and Engelmann also maintain that the language program has the capacity to develop the child's ability to formulate meaningful questions about the basic properties of concepts and relationships among concepts (Bereiter and Engelmann, 1966).

Bereiter and Engelmann use a technique known as "pattern drill" for teaching language content. Teacher-pupil interaction is in the form of verbal presentation-demonstration followed by question and answer strategies.

Bereiter-Engelmann Language Program

Developmental Stages

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1.) First-order statements

      (a) The identity statement - singular
          This is a <u>block</u>.

      (b) Identity statement - plural
          These are <u>blocks</u>.

      (c) Not statements
          This is not a <u>block</u>.
          These are not <u>blocks</u>.

2.) Second-order statements
          non-polar attributes
      (a) Color

      (b) Prepositions

      (c) Not

Second-order identity statements
      (a) Classification
          ex: animals, plants, parts, weapons, furniture

Second-order statements
          Polar attributes
      (a) Polar discriminations - singular
          This _____ is _____ (fat, skinny,-
                          (tall, short, etc.)

      (b) Polar discrimination - plural
          These are_____ are _____ (rough, smooth,
                        (etc.)

      (c) Polar - "not"
          This _____ is not _____.

      (d) Polar deductions
          If this is <u>short</u>, then this is not long.
             If this is long, this is not short.
             If this is not short, this is long.
             If this is not long, this is short.

      (e) Special polars
          ex: before, after, next to

    <u>Reading curriculum</u>. The reading program is based on
the belief that the best way to teach reading is to

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concentrate on the operations that are involved in the
reading act. Therefore, the program begins with verbal
and sequencing operations that are necessary to perform
reading responses appropriate for simple words. Children,
therefore need to know the following four things:
Children must:

1. Recognize letter-sound correspondence;

2. Know that sound sequences are indicated by the
   special arrangement of letters which are formed
   into words;

3. Understand that any spoken word can be spelled by
   holding each sound in that word (e.g., m-a-n);

4. Realize that any word said slowly (as in m-a-n)
   can be "said fast" and then identified at a
   normal rate of speech.

These four steps comprise the order in which initial
reading skills are taught.

The later phases of the reading program include
learning the alphabet (forward and backward), over 200
irregular words, the concept of capital latters, and an
increased workload in vocabulary training and workbook
activities.

Arithmetic curriculum. The arithmetic curriculum is
based upon the assumption that arithmetic is a special
form of language which involves different types of
questions that may be answered correctly or incorrectly

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depending upon the child's store of knowledge.

The curriculum involves a set of strategies which are systematically arranged to teach arithmetical symbols, conventions and operations. Basic rules and strongly patterned problem-asking strategies are practiced under tightly subscribed conditions. The principal objective is the mastery of precision skills in basic arithmetic.

Music Curriculum. Music activities are correlated with successive steps in the language and reading programs. These activities basically serve to reinforce language principles.

BASIC TEACHING STRATEGIES AND
ROLE OF THE TEACHER IN THE DIRECTIVE PROCESS

The Bereiter-Engelmann program is probably without peer in terms of the directive functions served by the teacher. This intensive academic orientation requires individuals who are extremely skilled in the implementation of language, arithmetic and reading activities. Nothing in the Bereiter-Engelmann program is left to chance, guesswork, or intuition. "Goals are concrete, teacher actions are deliberate, and sequencing is pre-determined." (Evans, 1971). Bereiter-Engelmann take the position that teaching skills must be learned and perfected - there is no "natural-born teacher" - Engelmann is guided by the principle that teachers must be told exactly what to do and how to do it.

The mixture of teaching-techniques used in the Bereiter-Engelmann curriculum has been conceived specifically with small group instruction in mind. These techniques range from the mechanics of presentation to feedback strategies.

Teachers are advised of certain strategies for teaching. For example, while group activity is underway, an individual child should never be worked with for more than 30 seconds at a time. This policy is relevant to motivation - keeping children actively involved and the encouragement of total concentration as children take

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turns rapidly in the course of responding to teacher
questions. Teachers are urged to use short explanations,
geared at all times to the child's current store of
information. Rhythmic phrasing of verbal statements and
clapping are used to dramatize basic language patterns.
Feedback is given constantly. The teacher must inform a
child very clearly when he has or has not made a correct
response.

Although the teacher works at a fast and steady rate
of speed, children are not pressured to hurry or speak
unnaturally fast. A violation of this principle defeats a
main purpose of the Bereiter-Engelmann training, i.e., to
expand and standardize expressive language. Children are
encouraged to speak loudly and distinctly at all times.
Liberal questioning by the teacher is essential to
maintain the interaction which is characteristic of
Bereiter-Engelmann instruction. Yet teachers are warned
to avoid the use of "cues" or "prompts" because they may
signal to the child the expected response. An example of
such a "cue" would involve a teacher forming the beginning
of a word on her lips.

A most significant teaching strategy is that which
calls for differential levels of difficulty at varying
times in the instructional period. Level one (least
difficult) requires only that a child point to an example
of a concept under study (e.g., "Show me which ball is

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blue."). Level two requires a "yes-no" answer to questions ("Is the ball blue?") The third level of difficulty requires a child to repeat basic statements (Teacher: "Is this ball blue?" Child: "Yes, this ball is blue.") Level four (most difficult) sequences that a child identify critical attributes or conceptual relationships by appropriate statements in the absence of direct questions (Teacher: "Tell me about this ball.") Difficulty level is varied according to the children's skill and fatigue level, although level four is preferred whenever possible.

In sum, the directive process can be characterized as a technique which is highly selective, teacher-centered and teaches convergently. Heavy stress is placed upon techniques and incentives which encourage children to work rapidly and steadily with a prescribed set of activities.

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Interaction Patterns in the Directive Process

As part of the professional and academic development of the students in the Early Childhood program at the University of Virginia, the staff videotaped selected interactions between these students and children of preschool and primary ages. The interactions consisted of teaching the children concepts using either the developmental or directive process.

The video tapes were subsequently analyzed in the following areas: strategy used, mode of interaction, content of interaction, and media motivation. A description and discussion of the above areas can be found in the module entitled Developmental Learning Process (Mann, 1974).

These tapes were evaluated by several judges and a high inter-judge reliability was achieved. Although the results have not been statistically analyzed at this time, certain trends or patterns have been identified in the interactions between the students and children. Both the directive and developmental teaching processes provided observable trends. However, for purposes of this module, only those patterns identified with the directive process will be discussed.

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To facilitate the reader's understanding of the teacher-pupil interaction pattern in the directive process, examples of directive teaching are presented and explained below.

RATING SCALE FOR DEVELOPMENTAL - DIRECTIVE PROCESSES

Teacher: Sandi
Developmental Outcome: <u>Directive Process: Classification</u>
<u>of Colors</u>
Learner Characteristics of Child: 5 year old male--high
risk; low vocabulary
Situational Variables: Classroom activity with one child

Incident	Strategy Used	Mode of Interaction	Content of Interaction	Media Motiva-tion
1	IS	Id	BC	
2	VR	Not coded	Not coded	
3	DS	I	CC	Object (ball)
4	IS	Id	BC	
5	VR+Ex	-+Cl	- +CC	
6	DQ	I +Cl	CC	O (ball)
7	VR+NVR			
8	DS	I	Tþ	
9	HQ	I	SI	
10	DS	I	CC	O (ball)
11	VR			
12	DS	I + Cl	CC	O (ball)

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The interaction is as follows:

Incident

1 - The teacher says, "Look at me." (Imperative statement (IS), giving a direction (ID) in order to control behavior (BC). The child responds by looking at teacher.

2-- The teacher verbally reinforces the child - "I like the way you looked at me." (VR)

3 - The teacher holds up a ball and says, "This ball is blue." (Direct Statement (DS) giving information (I) and classifying the ball as a color--blue. (CC)

4 - Teacher says, "Say, this ball is blue." (Imperative statement (IS) giving a direction (ID) while controlling behavior (BC). Child responds with, "Ball blue."

5 - Teacher reinforces child verbally saying, "That's good talking. (VR) The ball is blue." (Ex) (Extending the child's phrase "Ball blue.")

6-- The teacher questions the child, "What color is this ball?" (Direct question (DQ), asking for information (I) and also for a color classification (Cl) and (CC). Child responds, "Blue."

7 - The teacher reinforces the child verbally, "I really like the way you're talking today," (VR) and simultaneously pats his hand (non-verbal

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reinforcement - NVR).

8 - The teacher states, "I'm going to trick you this
time." (Direct Statement (DS) giving information
(I) by stating her (teacher's) behavior (TB).

9 - "Do you want to be tricked?" (Asks an hypothesis
question (HQ) requiring only a yes-no answer--She
seeks information (I) from the individual child
(SI). Child responds "No!" to question.

10C- Teacher holds up blue ball and says, "This ball
is red." (Direct statement (DS) giving informa-
tion (I- ball is red) and classifies the ball
according to color (CC). The child corrects her
with, "Ball blue."

11 - Teacher verbally reinforces, "You're thinking
hard today. Great." (VR)

12 - Teacher states, "This ball is not red--it's
blue." (Direct statement (DS) giving information
(I) and classifying the ball by color (Cl and CC).

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DIRECTIVE PROCESS COMPETENCIES

Cognitive Competencies

Student will demonstrate knowledge and understanding of the following:

1. Measurement of behavior

2. Basic behavior principles

3. Applied analysis of behavior

4. The elements that comprise the Bereiter-Engelmann approach to teaching reading, arithmetic, and language.

Skill Competencies

1. Be able to pinpoint or define a child's behavior as an observer; countable, repeatable movements of the child.

2. To be able to record reliably children's behavior in the classroom setting using an appropriate recording method (e.g., event recorded, duration, performance to criterion, etc.).

3. To be able to accelerate or decelerate the child's behavior using techniques derived from behavior principles (e.g., positive reinforcement, punishment, extinction, etc.).

4. To be able to access behavioral change by using an appropriate single subject design (e.g., reversal, multiple baseline, changing criterion, etc.).

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MODULE SCHEDULE AND REQUIREMENTS

TOPIC: Bereiter-Engelmann Approach

INSTRUCTOR:

CLASS DATES:

FOUNDATIONAL MATERIALS:

<u>Teaching Disadvantaged Children in the Preschool</u>

Carl Bereiter and Siegfried Engelmann

Prentice-Hall

1966

SUGGESTED SUPPLEMENTAL READINGS:

<u>Books</u>

Bereiter, Carl and Engelmann, Siegfried.
    <u>Teaching disadvantaged children in the pre-</u>
    <u>school.</u> Prentice-Hall, Inc., Englewood
    Cliffs, N.J. 1966.

Science Research Associates, Inc.

1969

<u>Conceptual Learning</u>

Siegfried Engelmann

Dimensions Publishing Company

1969

Fox, Glenda Ann and Meyers, Linda. "A manage-
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tional implications of the Jensen debate. In

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New York: Brunner-Mazel, 1970.

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instruction on ⁻Q performance and achievement in
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Mazel, 1970.

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Hawkes (Eds.) <u>The Disadvantaged Child: Issues
and Innovations</u>, New York: Houghton-Mifflin,
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early childhood education, <u>Exceptional Children</u>,
1971, 37, 629-640.

Day 1 - Orientation   1:00 - 4:00   classroom
            Assignment: read text
                    A.   Close attention to all Chapters except 9 & 10
                    B.   Knowledge of Chapters 9 & 10

Day 2 - Reading day - no class   Individual conferences

Day 3 - 1:00 - 3:30 - Question and answer period - classroom
                        - Evaluation
                    A.   Oral test on text and orientation materials
                    B.   Students will sign up for time slot

Day 4 - Use of DISTAR Materials   1:00 - 3:30   classroom
            Assignment: Skim supplementary material

Day 5 - Use of DISTAR with one child at field center

Day 6 - classroom
            Videotaped at field center with one child using
            DISTAR material
            Discussion of video tapes
            Group practice
            Behavior problems   (pp. 78-91)
            Assignment: read several articles

Days 7, 8, & 9 - Practicum in respective field sites (8:00 -
                                                        12:00)
            Evaluation: video tape 3rd day of practicum experience

Day 10 - Review evaluation video tapes

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Instructions for Reading the Text

When you are reading the text, you will find yourself inundated with pertinent information. The following are given to aid you in your reading. When you read, do not try to learn every bit of information on the first reading. Try to glean basic information. Know the types of children who benefit from this program, and why. Be able to define the classroom set up most complimentary to this approach. If possible, derive a self-made formula that implants the basic question and answer structure in your mind. The following key phrases and steps may be helpful:
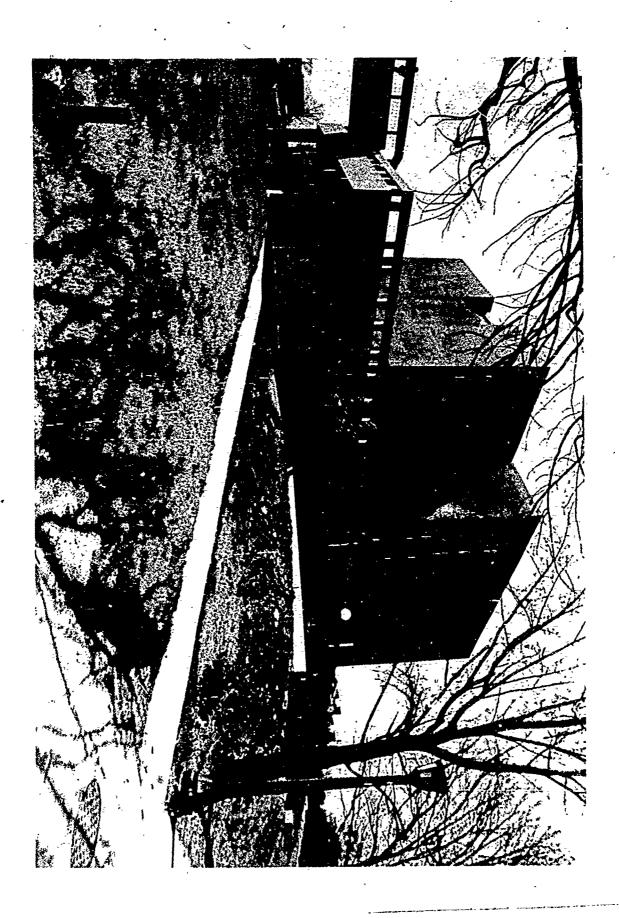
1. Singular identity statement
2. Plural identity statement
3. "Yes-no" questions
4. "What" questions.
5. Negative identity questions
6. "Where" questions

While you attend to structure, keep in mind the time suggested for different units, and how your own mistakes and the child's may be corrected. Remember -- everyone makes mistakes, but the intelligent person corrects these mistakes and learns from them.

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