A math curriculum of beginning number concepts for learning handicapped students

Rebecca Harms

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A MATH CURRICULUM OF
BEGINNING NUMBER CONCEPTS
FOR LEARNING HANDICAPPED STUDENTS

A Project Submitted to
The Faculty of the School of Education
In Partial Fulfillment of the Requirements of the Degree of
Master of Arts
in
Special Education: Learning Handicapped Option

By
Rebecca Harms

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DEFINITION OF THE PROBLEM

As a teacher of learning handicapped students, I receive primary elementary students who lack mastery of beginning number concepts, such as:

(1) qualitative differences (same, different, etc.);
(2) classification;
(3) one to one correspondence;
(4) matching of numerals to corresponding sets;
(5) recognition/distinguishing of numerals; and,
(6) addition and subtraction of numerals.¹

The students in my program are identified as "learning handicapped." According to the office of San Bernardino Superintendent of Schools and Riverside County Superintendent of Schools, learning handicapped students are defined as having either a specific learning disability or being mentally retarded.²,³ Firstly, pupils with specific learning disabilities are further identified as exhibiting a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These specific disabilities may be manifested in an imperfect ability to listen, think, talk, read, write, spell or do mathematical calculations. Secondly, the mentally retarded learning handicapped student by San Bernardino's definition "has significantly below average general intellectual functioning existing concurrently with deficits in adaptive
behavior and manifested during the developmental period, which adversely affect a pupil's educational performance. The learning handicapped definition does not include those children with learning problems which are primarily the result of visual, hearing or motor handicaps, or of environmental, cultural or economic disadvantage. Given this definition, the total category of "learning handicapped" includes students with a wide range of abilities.

These students with varied abilities often enter a learning handicapped program after being exposed to mathematical learning through standard, paper/pencil, textbook-oriented instruction in a regular classroom for one to three years. Even so, initially, most of them, to varying degrees, are lacking in beginning mathematical knowledge. San Bernardino's East Valley Special Education Department further states, in regard to the learning handicapped pupil, that "generally, their attitudes and study habits are such that specially developed methods, materials and techniques are often necessary to assist in achieving their maximum potential."

Therefore, the crucial problem is in finding or developing methods, materials, and techniques appropriate for the varied needs of this special population.
PROPOSED OBJECTIVE

It is the purpose of this project to evaluate, according to current research, alternative teaching approaches and materials for learning handicapped pupils. Based on this evaluation, I plan to create and organize a curriculum that will facilitate and maximize the learning of beginning math concepts for the primary age learning handicapped pupil.
REVIEW OF LITERATURE

The intent of the literature review is to find information that relates to developing a mathematical instructional program for learning handicapped students who need to master beginning number concepts. The review is in two sections. The first gives the theoretical and educational background; the second is a review of current research.

Theoretical/Educational Background

Among many theorists and educators my initial interest was drawn towards the work of Piaget and Montessori. The work of both Montessori and Piaget holds forth the basic tenet that learning begins for young children through their sensorimotor interaction with the environment, and that children must be presented with material appropriate for their varied learning stages.

"The work of Montessori may be considered the forerunner of developmental theory concerning motor, sensory, and intellectual development, later refined and reformulated by Piaget, Bruner, and others. The use of concrete materials in the classroom as representations of abstract principles appears to be a major strength of the Montessori method."7

"The Montessori approach encompasses the entire physiological and psychological development of the child. [For Montessori] The learning of arithmetic is seen as integrally related to the education of the sense, and most of the sensory training materials are readily adaptable for arithmetic activities."8
Montessori advocates a careful sequential development of basic numerical concepts rather than presenting "certain preliminary ideas in haste." Her didactic manipulative material contains within itself the control of error, thus allowing for individual exploration and self-paced learning.

Piaget's theory states that early sensorimotor experiences are basic to later, more complex mental development. In applying Piaget's theory to math, Brearley explains how mathematical concepts begin "in the earliest explorations of infancy as a baby discovers the permanence of objects, spatial continuity and sequence in his own actions and in events which happen to him."

Piaget's theory further develops progressive "stages of learning experienced by all children at different rates in ordered, continuous, overlapping growth." A group of co-authors in The Teaching of Young Children (Some Applications of Piaget's Learning Theory) stress, "If anything is certain about the learning process, it is that one cannot miss out on stages and hope to get a satisfactory result." The co-authors (chaired by Brearley) continue by saying that slow learners may take longer and need more intermediary steps, but emphasize that no stage may be passed over; rather, educators must find out what a child has learned and build on that.

Also integral to Piaget's theory is the concept of "readiness." Hammill and Bartel in their book, Teaching Children with Learning and Behavior Problems, say, "Insufficient readiness
may seriously affect the performance of a child at any level of arithmetic functioning."16

In 1929 Piaget began research specifically on numerical concepts. Much of this work was done in collaboration with Piaget's most famous student, Barbet Inhelder.17 Inhelder and Piaget (1964) worked extensively on classification skills.18 Piaget himself did not work out an instructional program but, based on his findings, others have developed experimental curricula, primarily for preschoolers.19 One of these developers, Weikart, believes "that the classification skills studied by Inhelder and Piaget (1964) are absolutely fundamental to the learning of such familiar subjects as reading and arithmetic."20 Hammill, in his chapter on "Problems in Mathematic Achievement," specifically states, "Basic to the development of arithmetic-related abilities is the child's ability to classify."21 Piaget would say the ability to make classification discriminations is usually attained by a child sometime between two and seven years.22

"In accordance with the general Piagetian principle of actions preceding perceptions, children should be encouraged to enact as many concepts as possible and to manipulate two-and three-dimensional objects in the initial stages of classificatory behavior."23

For Piaget, mathematical knowledge is not rote counting of numbers or memorization of mathematical rules, but it is "constructed by the child through interactions between his mental structures and his environment."24 Piaget places emphasis on
interaction with the environment, developmental stages of learning, the discovery mode of learning and peer tutoring.

Building on the developmental theory are the advocates of perceptual-motor development. They view the relationship of motor learning to higher-order learning as follows:

```
Motor learning -> Perception -> Concept
      |                        | Higher-order
      ↓                        | Cognitive
      Academic                | Functioning
      Learning

(25)
```

Their premise is that, by correcting perceptual-motor disabilities, academic learning will be improved.

Although each writer provides his own perspective, the basic premise of the perceptual-motor position exists in the works of Barsch, Frostig and Getmos, who stress visual-motor processes, and Kephart and Delacato, who focus on basic motor learning.26 However, there still seem to be many unanswered questions in this area.

"On the basis of their review, Myer and Hammill conclude that perceptual-motor programs are still highly experimental and non-data-based. They point out we need more research that considers (a) the characteristics of children for whom such training is helpful, (b) the time required for achieving effectiveness and (c) whether or not perceptual-motor processes can be improved via training.

In review of studies concerning the relationship between reading difficulties and
perceptual motor deficits, Vellutino, Stiger, Mayer, Harding, and Niles (1977) report that it is unlikely that perceptual disorders cause many reading problems. Instead, they provide research results that support a relationship between poor reading and linguistic deficits.

Many of the perceptual-motor training programs commonly used, then, do not directly improve academic achievement or perceptual-motor development. Until further research, the inclusion of academic content in motor activities is desirable. Cratty (1971) stresses this approach in which children can perform motor tasks involving letters, concepts (up, down), words, and telling time (e.g., let the child use his arms as clock hands to display various times).27

Other educators have emphasized the multisensory approach in the techniques they have developed. The V-A-K-T method (visual, auditory, kinesthetic and tactile)28 features the steps of seeing, hearing, writing and tracing, and frequently uses materials such as sandpaper, finger paint, sand trays and raised and sunken letters to increase tactile and kinesthetic stimulation.29 Gillingham, Slingerland and Fernald all have programs based on the V-A-K-T method. Some teachers have successfully applied the V-A-K-T method to teaching arithmetic.30

Many of these multisensory materials are part of Montessori's program as well. These specifically developed V-A-K-T programs often stress a very routine step-by-step procedure for each new concept learned.

Task analysis is an area addressed by Mark Gold in his series of eight films, "Try Another Way,"31 aimed toward the mentally retarded and severely handicapped population. His films
demonstrate the process of breaking down a given task into small, achievable, one movement steps. One example he gives is teaching a severely handicapped child to drink from a cup. The first movement is raising the arm into proper position, next is placing the hand correctly, next is grasping the cup, etc. The concept is to break whatever task into small enough components so that it can be easily learned. The amount of breaking down would depend on the needs of each given student.

As applied to math, the task could be to recognize the numeral 1 instead of 1-10 or breaking it down further into the levels of learning such as ability to match numeral 1 with numeral 1, then the ability to recognize numeral 1 among other numerals, and finally, the ability to recall that a numeral 1 is a numeral 1, first alone and then in a group of numerals.

Several other areas worthy of mention are promoted by the educators at Redlands Diagnostic Center. They present the concepts of developing probes to find a student's working level, sequenced lists of skills in varied academic areas, and mastery of each specific skill before progressing on to succeeding levels. They also emphasize the three levels of learning mentioned above: Match, recognition, and recall, to distinguish what type of learning a student is engaging in and ways to facilitate each level.

A recurring theme found in literature about learning handicapped students is their lack of self-confidence. The following ideologies each address this issue in a different way.
Mark Gold's mode is task analysis, but his goal is finding a way that students can be successful. His premise is that there is a way; it just needs to be found.

Fitting in with the success-oriented elements of task analysis is the concept of mastery learning, given special attention by Redlands Diagnostic Center. Among other elements, this presentation of mastery learning deals with computing a personal mastery level (success level) and keeping colorful, visual, student-kept graphs that chart a student's personal success. The graph shows the progress in a specific skill area such as recognition of numerals. Equally important to the success orientation are the levels of learning: "Yes, Johnny is successful at matching the numeral 1"; "Yes, Johnny can now recognize the numeral 1"; "Yes, Johnny now recalls the numeral 1."

Psychocybernetics also addresses the issue of success. Authors on the subject speak of activating your success mechanism through visualization and auditory programming techniques. One psychocybernetics proponent quotes President Elliot of Harvard University in his speech, "The Habit of Success": "Many failures in elementary schools are caused by the fact that beginning students are not given a sufficient amount of work at which they could succeed." Consequently, psychocybernetics says students never had the opportunity to develop the atmosphere of success, or the winning feeling. "Small successes, Dr. Elliot contended, would arouse the student's enthusiasm, give him the success which would be a valuable ally in any future undertaking."
Besides low self-esteem, lists of characteristics common to many learning handicapped students often include some of the following, along with teaching suggestions for each characteristic.37

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<tr>
<th>CHARACTERISTICS</th>
<th>NEEDS/SUGGESTIONS</th>
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<td>1. Limited attention span.</td>
<td>- Work in short blocks of time.</td>
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<td>- Alternate quiet work with physical activity.</td>
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<td>2. Often lacks qualities of judgment, logic, organization.</td>
<td>- Use specific directions.</td>
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<td>- Have organized materials and routine schedules.</td>
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<td>3. More limited ability to foresee the outcome of their actions.</td>
<td>- Needs a classroom environment where standards are firm and consistent.</td>
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<td>4. Compensatory behavior through aggression or withdrawal. Often gives up easily. Frustration prone.</td>
<td>- Daily opportunities for success at all levels of ability.</td>
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<td>- Immediate reward meaningful.</td>
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<td>5. Difficulty in working with other children. Upset easily.</td>
<td>- Option and space available to work alone when he chooses.</td>
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<td>6. Confused with too many symbols.</td>
<td>- Simplify work sheets.</td>
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<td>- Block out distracting parts.</td>
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<td>- Give a visual model.</td>
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<td>- Use numbered boxes.</td>
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CHARACTERISTICS

7. Limited transfer or learning from one activity to another. Difficulty learning abstract concepts.

NEEDS/SUGGESTIONS

- Opportunity provided to apply learning in many situations.
- Practical, concrete materials are needed.
- Relate learning to immediate daily living.
- A multisensory approach is helpful.

Research Studies

Eudy (1973), in her dissertation, "The Effectiveness of a Mathematical Device Called a Tryab on the Arithmetic Achievement of Primary Students," based her study on the concept that learning begins for primary students through the manipulation of objects and that starting with objects, the student could more easily learn the more abstract processes. For her study she developed a tryab, which is a trilateral-faced board with a peg board, for concrete manipulation of objects; a flannel board, for semi-concrete; and a chalkboard, for the transition to the more formal abstract steps. The tryab was an attempt to move from the manipulation of objects to the abstract in a logical, connected, three-step process.38

For this study, 2 groups of 32 first-graders were matched by I.Q. scores, preschool experience, and math understanding. The control group used a traditional instructional mode, and the
experimental group used the tryab. No significant difference was shown between the pretest and post-test scores of either group. The items showing the most gain with the tryab were inequality and geometry. The item with the least gain was recognition of sets.39

In Brown's dissertation, "Active Movement as a Means of Developing and Reinforcing Selected Mathematical Concepts at Preschool Level," 40 students ages 3 to 5 were studied. They were classified according to their number knowledge, and randomly assigned to a traditional treatment that used activity sheets, manipulatives, visual aids, and songs. The experimental group's activities involved the large muscles to teach math. A pretest showed the two groups to be equivalent. After one month's treatment, no significant difference was found between the post-test scores of the 2 groups.40

A study by Lamson (1975) compared the DMP (Developing Mathematical Process) program with the Distar Arithmetic Program. The DMP uses concrete manipulative materials and the discovery mode of instruction, while the Distar Program uses direct instruction. The control and treatment groups were first-graders. The evaluation criteria consisted of items agreed upon by both DMP and Distar experts as being taught by their materials. The research concluded that the first-graders using the Distar Program with direct instruction in the pilot study had significantly higher mathematical achievement. Lamson also recommended further study because of the small size of the groups in the pilot study.41.
My initial interest in task analysis for "learning handicapped" was piqued by Mallow (1976) in a study with low-ability Junior High-aged children. In Mallow's study, the task analysis group showed more significant gains in math than a traditional program using token reinforcement.

Another study (by Rothenberg, Lehman, and Hackman, 1979) keyed in on task analysis and sequenced activities. In this study, at-risk pre-kindergarten children were identified. There were three groups compared: A control group, a learning-assisted program and the treatment group, being the MECCA program. Attention was given equally to teaching time and comparable teacher training. The MECCA program was a total-involvement project, but the two crucial components were task analysis and sequential activities. The results indicated that the MECCA kindergarten students scored significantly higher on standardized readiness measures compared with similar children with potential learning problems in the alternate treatment and control group.

The research study, done by Singh and Ahrens (1979), added weight to using hierarchically sequenced materials. Some preliminary work was done with moderately retarded children. No control group was used, but significant gains were shown using the Distar Arithmetic I curriculum. Based on this work, Singh and Ahrens (1979) formed an experimental and control group. Care was taken to give comparable teaching time and reinforcement. Both groups of 8 mentally retarded children showed a steady monthly increase, but the experimental group progressed at a much higher
rate. Results revealed that the experimental subjects learned significantly more objectives over the 12-month training period than did the control subjects. The subject matter for the experimental group was broken down into smaller objectives, and after each objective, the student was tested for mastery. At that time further training was given until the student could pass the mastery test for that objective. Each objective was mastered and tested before going on to the next objective. The two elements that seem crucial here are the breaking down of material into small components and the frequent checking for mastery of each step before proceeding to the next step.

The current trends that stand out in the literature are the use of direct teacher instruction, task analysis, sequenced skills, frequent checks for mastery, and success oriented teaching.
SUMMARY

The goal in this project is to find methods, materials and techniques appropriate for teaching beginning math concepts to learning handicapped students.

The research presented shows, in Lamson's study with first graders, that direct instruction is a useful tool in an early math curriculum. Rotherberg's study using "at-risk" pre-kindergarteners found task analysis and sequenced activities to be crucial factors. Singh and Ahrens, using the moderately retarded population, also target task analysis plus frequent checks for mastery as making a significant difference.

Eudy's (1973) study with the tryab showed no significant difference in acquiring math concepts with this particular concrete manipulative device. Brown also found no significant difference in the mathematical learning of preschoolers using large muscle activities versus a more traditional method.

Although Brown's one-month study showed no difference, I personally feel this issue to be worthy of more research involving: (1) Extending the treatment for a longer time period; (2) Using a control group and a treatment group, both with hyperactive children; and, (3) Specifically for my purposes, replicating the research with a learning handicapped population.

Next is the overview of the theoretical/educational background. Although not specifically validated through the limited research presented, I see the work of Montessori and
Piaget as a theoretical background to build on. As to perceptual-motor training, many questions remain to be answered. At this point, I support Mercer in providing motor activity that involves academic content. Also for my work I would like to be specifically aware of the multi-modal emphasis on the V-A-K-T method, but choose not to utilize the rigid routines many of these programs contain.

Neatly coupling with the emphasis of the research is the work of Mark Gold and the Redlands Diagnostic Center concerning task analysis, sequenced learning, and frequent checks for mastery. Elements in educational literature concerning success orientation promoted by psychocybernetics, Mark Gold, and the Redlands Diagnostic Center fit in with my personal beliefs. The list of characteristics of learning handicapped students, although not conclusive, seems an invaluable consideration in structuring an appropriate learning environment.

In developing the following math curriculum I plan to: (1) Build on the broad theoretical basis of Montessori and Piaget; (2) Specifically target the areas of task analysis, sequenced learning activities, frequent checks for mastery; (3) Incorporate a multimodal approach; (4) Key in on success-oriented methods; and, (5) Utilize the characteristics of learning handicapped students to organize an appropriate classroom management system.

In focusing on these areas to develop a math curriculum, I in no way choose to ignore other positions; I believe an effective
teacher also needs to be flexible and sensitive to each child's unique characteristics.

Based on the information presented here I will develop and organize a curriculum of beginning number concepts for primary age learning-handicapped students. The project will be based on the Cope Kindermath materials, an already developed curriculum on the market. This curriculum features sequenced learning, direct instruction, and frequent checks for mastery. Fully detailed in the project will be a success oriented management system that utilizes centers. Also included will be an introductory set of activities that correspond to the Cope Kindermath sequenced materials. These activity cards will be developed on the match-recognition-recall concept of learning levels. The Appendix will contain additional resources that can be used in the further extension of this project.
THE PROJECT

A Math Curriculum of Beginning Number Concepts For
Primary Age Learning Handicapped Students

A. OVERVIEW

I have chosen to use the Cope Kindermath Program as the academic core of the curriculum project. The Kindermath Program incorporates the aspects targeted in the review of the research literature as being significant determining factors in mathematic achievement for primary age learning handicapped students. These aspects are:

(1) Direct teacher instruction.45
(2) Task analysis.46
(3) Sequenced skills.47
(4) Frequent checks for mastery.48

The vital addition to the Kindermath materials are based on the review of the literature as well. They are:

(1) A total success oriented management system built around the characteristics of learning handicapped students.

(2) An introductory set of activity cards that directly match each lesson card. These activities provide multimodal experiences to reinforce the lesson and are based on the different levels of learning (e.g. the Match-Recognition-Recall Concept).49

These two additions are crucial because they move the research backed Kindermath curriculum out of a "clinical situation" where skills are taught in isolation and into an arena...
where a more total integration of concepts is fostered and specifically orchestrated.

B. THE COPE KINDERMATH PROGRAM

The Cope Kindermath Program is part of a total cognitively oriented pre-primary experience. The mathematical component, Cope Kindermath, utilizes the direct instruction mode. Each child works at his own pace based on an individualized diagnostic/prescriptive approach using developmentally sequenced curricular objectives.

The program has nine objectives each divided into levels:

A. Same/Different;
B. Patterns/Concepts;
C. Sets 0 to 5;
D. Numerals 0 to 5;
E. Shapes;
F. Sets 6 to 10;
G. Numerals 6 to 10;
H. Signs; and,
I. Addition/Subtraction.

The program is designed to be taught using direct teacher instruction in either a one-on-one situation or with a small group. Each level of a given unit is to be mastered by each child before the next level is attempted. A particular lesson may be repeated as often as necessary until mastery is achieved. The program is designed to fit into the other components of a regular
classroom or to be used in conjunction with the other Cope materials.

The student is placed in the program by checking on the mastery level of each of the nine objectives. This is done by using the green card at the end of each unit. If the child has not mastered an objective the checking stops and the student starts at the first level of that unit.

The crucial element is that mastery is assured before each succeeding level is attempted.

The materials for the Kindermath Program are housed in a compact 6" by 9" by 4" plastic box. Each level is typed on an 8" x 5" card with clear step by step directions. The box also contains a set of needed materials (i.e., blocks, number cards, objects, etc.).

C. ORGANIZATIONAL PLAN

1. Centers

Overall Structure

The overall structure of the organizational plan is based on four centers to which each child or small group rotates daily for 10 to 15 minutes. This time span is appropriate for the short attention span of the learning handicapped student, as well as fitting in with their need for frequent changes of activity and alternate types of instruction. Different centers also allow the teacher to give daily individual or small group instruction on each student's level. This is of prime importance especially
since the learning handicapped population includes such a wide range of abilities.

Individual Centers

These centers are:

1. **Direct Instruction** - to allow for direct teacher instruction at each child's individual instructional level.

2. **Rug Activity Center** - to allow for the use of manipulatives in the reinforcement of the concepts taught.

3. **Table Activity Center** - to allow for pasting, cutting, coloring and clay activities to reinforce direct instruction.

4. **Free Play Center** - to allow for student initiated activities; to give the student an opportunity to integrate the concepts being taught in their own way; and, to give the student a change of pace from the more directed tasks of the other centers.

Teacher and Aide's Roles

Ideally the centers function with a teacher working at the Direct Instruction Center and an aide or volunteer floating around to the other centers. The aide's job is primarily to facilitate and reinforce by verbal dialogue the concepts the students are working on.
Time should be spent to fully acquaint the aide with the total program and to share and discuss the positive rationale behind the rules. The aide's role of facilitator and positive reinforcer should be strongly emphasized and practice dialogues acted out if further training is needed.

An added help in training your aide would be to give her a copy of the Characteristics of Learning Handicapped Children (In Appendix) and have her read through the research background of this project, as well as the total project itself. An informed aide fully trained by you can be an invaluable ally.

The activities the students are involved in at the Rug Activity Center and the Table Activity Center are typed on cards with appropriate interaction dialogue for a facilitator. These cards will be in the student's folder at each center for the aide to refer to.

Depending on the activity, an appropriate dialogue for the aide could be, ["Terri, show me the one that is the same."] or ["Show me the card with the same number of circles as your bears."] but, since having an aide is not always possible it is of prime importance for the students at each center, other than the Direct Instruction Center, to only be given work that they can do successfully on their own. Also clear center rules and procedures need to be established so that the students have the security of the routines to help them function independently.
Center Physical Arrangement

It is important that the centers are arranged so that the teacher at her work area is able to have direct eye contact with all the other centers. This is especially important if an aide or volunteer is not helping. Also important is having the centers arranged so that the rotation to the next center follows a definite circular or square pattern. This gives the learning handicapped student added built-in structure and allows for more independent changing from center to center. The following is an example of a possible arrangement:

2. Center Rules

As pointed out in the Characteristics of Learning Handicapped Students, clearly established routines need to be set up. These routines need to be firmly established at the beginning of the program to allow for more independent working later.
The Center System Rules are very important and it is crucial that the teacher understands the rationale behind the rules in order to firmly and consistently reinforce them.

Rules:
1. Work quietly!
2. Do not interrupt the teacher's work center.
3. Finish your work.
4. Clean up!

Rationale:
(1) The most basic rationale for the rules is that they allow the teacher uninterrupted direct instruction time for each child at his own level.
(2) The rules also stress independence and personal responsibility.
(3) The rules create a conducive environment for a variety of learning activities.

In enforcing these rules it is important to be convinced that these three rationales have top priority. Also important to remember is that the time a student must work independently (assuming there is no aide) is only 10 to 15 minutes at each center and that at the end of the 10 minutes, during clean up, there is a time for verbal praise and interaction. The other
factor involved is that the students working alone should be presented only with work they can accomplish without help.

3. **Center Procedures**

**General**

For the center work each child has an individual folder. Each center has a decorative box where the folders are put. The folders contain a chart of that child's work progress, award/sticker sheets, daily activity cards and daily work sheets.

At the beginning of the program several days or weeks should be spent where all the students work at each center as a group. For example, everyone does an activity at the Rug Activity Center and under the teacher's direction all of the rules and procedures are followed. [For the beginning of the program when all the students are working as a group Rule #2 should be covered up. This Rule should be introduced when the group rotation is added.]

1. **Papers:** Each child gets his paper from his folder where he has assigned work on his individual level. His assignment is individually explained (This will be covered in more detail later).

2. **Noise Level:** Inside and outside voices need to be discussed. ["Inside voices are soft. Outside voices are louder."] ["We need to use our inside voices now."] ["Claudia, I am so glad you are remembering to use your inside voice."]
Demonstrate and play games with the children using inside and outside voices. Do this both inside and outside the classroom. During the demonstration of loud and soft voices it is also important to develop and teach a hand sign to correspond to inside/soft and outside/loud voices. If these hand signs are always used in correlation with the terms it will strengthen the learning process and also allow for later nonverbal communication during center work time for a student who needs reminding. Ideally an aide, or the teacher being in a position to have direct eye contact with all the students would softly address the student by name, make eye contact, and make the sign for loud and shake your head no and then do the sign for soft and shake your head yes. As time goes on this nonverbal dialogue can be abbreviated to only the hand movements. This is much less disruptive than a total, often loud, verbal dialogue, "John, work quietly!", etc. The goal again to reinforce is 10 to 15 minute blocks of quiet uninterrupted teacher instruction.

(3) **Rewards:** Quiet workers are rewarded with stickers. At this point stickers are given directly on their paper, on their hands or on special daily award sheets. Give stickers as frequently as necessary (even every few minutes). Catch the loud talkers at their infrequent times of talking quietly so they too can experience
success. Stickers can also be given for finished work and appropriate clean up.

(4) **Material Storage:** The teacher shows all the children where the materials are stored at each center, i.e., newspapers, paste, pencils, crayons, scissors, clay, blocks, paper, small sitting rugs, etc. Games can be played to reinforce where the materials are and how to put them back properly. Examples: "John, find and bring us an individual work rug." "Good, you remembered where they were!" "Jose, can you put the rug away?" (If he has trouble), "Would you like someone to help you put it away?" "Who would you like to help you? Choose someone." (If you have students who do not know the name of objects show them the object that needs to be found. "Tom find a rug like mine.")

(5) **Clean Up:** After each daily activity reinforce that the children clean up when the timer rings. If they have finished and are cleaned up before the timer rings they may get a book and return to their center. If your group is on a very low level you may need a special "quiet toy" box they can choose from when they finish early.

(6) **Rotation:** When the timer rings and they have finished cleaning up they sit with their folder waiting until everyone is finished and ready to change centers. Then the teacher asks them all to stand quietly and then
change to the next center. Waiting until everyone is standing before they are told to change can avoid the faster students from pushing or rushing the slower ones.

When the work at each center is completed, the 10 minute timer has rung, and all the children are cleaned up and standing with their folders the teacher tells the children to change centers. During these first few days or weeks they will all be directed to rotate together to the next center. They will be directed to:

(1) Get their papers out and put their folders in the box. With the help of an aide or volunteer each child's individual work will be reviewed and the following procedures are again reinforced:

(2) Stickers are given for quiet workers, those who finish their work and those who clean up appropriately.

(3) Time is given for demonstration and practice in getting, using and returning materials.

(4) The 10 minute timer rings and all the children clean up their area and materials are put away.

(5) The children sit at the table with their folder until everyone is ready. The teacher then asks them all to stand quietly and then to rotate to the next center with their folders.
#1 Direct Instruction and #2 Rug Activities

At the Direct Instruction Center the teacher:

(1) Instructs the student at his particular level from the Kindermath Card box.

(2) Records the student's progress on the chart in his folder.

(3) Gives and explains the activities for the #2 Rug Activity Center and the #3 Table Activity Center.

(4) The teacher selects the needed materials and puts them with the student's folder.

(5) The appropriate activity card is clipped on the outside of the folder for the aide to refer to later.

At the #2 Rug Activity Center the student places his folder in the box. He then gets out an individual floor mat on which his assigned task is placed. (Carpet squares approximately 16" x 16" can be obtained from a carpet store. If you explain the cause they may be donated.) When the timer rings he then returns his materials to the teacher, puts the mat away and sits quietly for the rotation to the next center.

#3 Table Activity Center

In the beginning at the Table Activity Center different types of activities should be done. Each new activity should be demonstrated first by the teacher and then practiced by the child. Several days could be for coloring, reinforcing where to get the crayons and how to clean up and put their work away. Games can be
included again to help everyone become independent in finding and putting away materials. "Jason find and bring us a pair of scissors." "Good job, Jason". "Now, Jason, choose someone to give the scissors to and see if they know how to put it away." (If at this point you again have some children who do not know the name of objects show them the object and ask them to find one like it.)

This similar game dialogue can be repeated daily if necessary until each child can locate all materials independently. Several days could be cutting and pasting activities, or only pasting, or only cutting, according to the needs of your group. The key is to give each child a small enough task that he can achieve it successfully in 10 minutes. For each new type of activity specific procedures need to be demonstrated and practiced.

Examples:

Cutting

(1) Get paper from folder;
(2) Get scissors;
(3) Cut paper;
(4) Throw away trash;
(5) Put scissors away; and,
(6) Put paper back in folder.
Pasting

(1) Get paper from folder;
(2) Get newspaper;
(3) Get glue;
(4) Follow demonstrated gluing procedures;
(5) Put completed picture in a designated place to dry;
(6) Close glue;
(7) Put glue away;
(8) Throw newspaper away; and,
(9) Wash hands.

It should be kept in mind how many procedures each child can follow independently and successfully. The goal is for the student to do all steps independently but if initially to be successful he needs fewer steps to follow the aide can assist with some of the steps. Sequenced picture direction cards can also be used. (See Materials for Table Activities.)

# 4 Free Play Center

At the Free Play Center #4 the folders are put in a box. The first days are spent in demonstrating and practicing the appropriate use and storage of each type of material such as blocks, toys, etc. At the beginning it is good to limit each day to one or two types of activities so proper storage can be learned. If this is taught thoroughly the independent clean up will go smoothly later. Take as many days as needed doing the center rotation as a group to firmly establish all the rules,
routines, and procedures. Toward the end of this phase stickers should be given only at the end of each center for the three specific rules being reinforced: Work quietly, complete your work, and clean up. As the aide or teacher bends over each child the dialogue could go something like this: "Jose you worked quietly, your work is finished and your work area is cleaned up nicely." As each rule is mentioned a sticker can be put on the child's paper.

Another dialogue could go as follows: ["E.J., I am so glad you remembered to work quietly and use your inside voice." (Sticker given).] ["We will wait to give you a sticker for your work until you finish it later."] ["Today you forgot to put your scissors away. Do it now please. I think you will try to remember tomorrow." (No sticker given).] If this were at the very beginning you could wait for the child to put the scissors away and then give him a sticker. Only do this a very few days.

**Group Rotation**

The next transition when all the rules and procedures are established is to form groups and rotate by small groups or as individuals to the four centers. Special emphasis needs to be made at this time about the rule of not interrupting the teacher during her special work time at her center. Role play scenes of students finding materials independently and thinking and looking at the picture direction cards before asking for help. Also role play the opposite, where a child interrupts the teacher at her
work center. If needed, go as far in the role playing as giving stickers for following the rules. In the role playing the students can be the teacher and the aides or teacher can be the student. Exaggerate the interruption. The scene could be: The student interrupting the teacher's center by coming up and loudly saying "I can't find the scissors!", etc. Role play enough over a period of several days so the students are clear on what it means to interrupt the teacher's working center.

At the beginning of this group rotation phase aides and teachers should again give stickers liberally.

The aide should observe the students and every few minutes reward them with stickers as they are following the rules. "Good, you are working quietly." (Sticker given). "I am so proud that you found your scissors without asking." (Sticker given). "I am glad your work is finished. You must feel good about that." (Sticker given).

You can put the sticker directly on the paper where the child is working, on their hand if that seems fun for them, or on a daily award sheet.

Later, to reinforce the Center Rules the teacher can keep a chart on each pupil's folder. The child could earn four stickers for each center if all of the four Center Rules were followed. At the end of the clean up of each center the aide and the teacher can circulate and put stickers on the four dots of the chart for the four rules followed.
The dialogue would be similar to those before. (See Example #1, Monday, Center #2). "Claudia, you worked quietly even when you helped Chris find his rug. That was good!" (Sticker given). "I am so proud that you helped him rather than interrupt the teacher. Thank you." (Sticker given). "You also finished your work and cleaned everything up. You are a real star today." (Two stickers given).

Another dialogue could be as follows: (See Example #2, Monday, Center #3). "Chris, today you were very loud when you were finding the scissors. I needed to remind you to be quiet. That also interrupted my work. I am sure tomorrow you will try to remember to work quietly and not interrupt others." (Sticker not given). "I like the way you followed our other two rules. You did such a nice job on your paper and your table is cleaned up so nicely. You even helped Claudia pick up her papers off the floor. You're learning to be a good helper. I like that." (2 stickers given).

At the end of each day the total number of stickers are recorded. (See Example #3). Rewards for stickers could be excusing the child with the most stickers first for recess, etc. On Friday all the students with 70-80 stickers could get a prize or get to choose a special fun activity. (See Example #3). The total required for a reward could be changed to 75-80 if there is a need to tighten and reinforce the procedures.
The dialogue would be similar to those before. (See Example #1, Monday, Center #2). "Claudia, you worked quietly even when you helped Chris find his rug. That was good!" (Sticker given). "I am so proud that you helped him rather than interrupt the teacher. Thank you." (Sticker given). "You also finished your work and cleaned everything up. You are a real star today." (Two stickers given).
Rules:
1. Work quietly!
2. Do not interrupt the teacher's work center.
3. Finish your work.
4. Clean up!

Center #2
Rug Activity

ACTIVITY

ACTIVITY

ACTIVITY

ACTIVITY
Another dialogue could be as follows: (See Example #2, Monday, Center #3). "Chris, today you were very loud when you were finding the scissors. I needed to remind you to be quiet. That also interrupted my work. I am sure tomorrow you will try to remember to work quietly and not interrupt others." (Sticker not given). "I like the way you followed our other two rules. You did such a nice job on your paper and your table is cleaned up so nicely. You even helped Claudia pick up her papers off the floor. You're learning to be a good helper. I like that." (2 stickers given).
At the end of each day the total number of stickers are recorded. (See Example #3). Rewards for stickers could be excusing the child with the most stickers first for recess, etc. On Friday all the students with 70-80 stickers could get a prize or get to choose a special fun activity. (See Example #3). The total required for a reward could be changed to 75-80 if there is a need to tighten and reinforce the procedures.

<table>
<thead>
<tr>
<th>Student</th>
<th>Center #1</th>
<th>Center #2</th>
<th>Center #3</th>
<th>Center #4</th>
<th>Daily Sticker Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom</td>
<td>Teacher</td>
<td>Rug Activity</td>
<td>Cut/Paste</td>
<td>Free Play</td>
<td></td>
</tr>
<tr>
<td>Mon.</td>
<td>LEVEL</td>
<td>ACTIVITY</td>
<td>ACTIVITY</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Tue.</td>
<td>LEVEL</td>
<td>ACTIVITY</td>
<td>ACTIVITY</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Wed.</td>
<td>LEVEL</td>
<td>ACTIVITY</td>
<td>ACTIVITY</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Thur.</td>
<td>LEVEL</td>
<td>ACTIVITY</td>
<td>ACTIVITY</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Fri.</td>
<td>LEVEL</td>
<td>ACTIVITY</td>
<td>ACTIVITY</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

Example #3

MIGHTY AWARD MONSTER

[Table showing activities and levels for each day of the week, with a weekly total of 76 stickers]
Recap

The students rotate to each center individually or in small groups depending on the size of the class and each child's working level. A class of four could have one child at each center. A class of eight could have four groups with varying numbers of children. One example would be four groups of children with two in each group and each group working on a different level of the Kindermath materials. The groups would depend on each child's placement on the initial checking for individual mastery (done with the green cards at the end of each level). A child should never be allowed to be placed in a higher group and thereby skip an objective. A child could be put in with a group that is working one objective lower and use that time to reinforce his learning and build feelings of success.

When the groups have been formed it is helpful to make a large chart to be posted to assist in knowing where each group should be working. The dark dots on the chart indicate what center that particular group begins working at each day. From their initial center they then rotate in a circular motion to each center, changing when the timer rings. Every day each group works at each center. Following are several examples of group rotations.
Group Rotation Examples

Rotation Example #4

The Tigers work with the #1 Direct Instruction Center first then rotate to the #2 Rug Activity Center, then to the #3 Table Activity Center and then to the #4 Free Play Center.

The Bears begin at the #4 Free Play Center then rotate to the #1 Direct Instruction Center then to the #2 Rug Activity Center and then finally to the #3 Table Activity Center.

Rotation Example #5

If shapes and colors are used to designate the groups this will aid in the learning of the shapes and colors and the symbols and colors can be used to mark folders, etc.

The circle group works first with the teacher and then rotates to #2, then #3, and then #4.

The square group begins at #2, then #3, then #4, and then #1.
The triangles begin with #3, then #4, then #1, and then #2.
The diamonds work first at #4, then #1, then #2, and then #3.

Rotation Example #6

The rocket group only has one student. This should be done carefully. There are times that a student would prefer to work individually but often working with at least one other student is an incentive. If two students on different levels are grouped together for this purpose you could split the direct instruction time between the two or as mentioned before have the faster...
Rotation Example #4

The Tigers work with the #1 Direct Instruction Center first then rotate to the #2 Rug Activity Center, then to the #3 Table Activity Center and then to the #4 Free Play Center.

The Bears begin at the #4 Free Play Center then rotate to the #1 Direct Instruction Center then to the #2 Rug Activity Center and then finally to the #3 Table Activity Center.
### Rotation Example #5

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The circle group works first with the teacher and then rotates to #2, then #3, and then #4.

The square group begins at #2, then #3, then #4, and then #1.

The triangles begin with #3, then #4, then #1, and then #2.

The diamonds work first at #4, then #1, then #2, and then #3.

#### Example #5

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Students Names</th>
<th>Center #1</th>
<th>Center #2</th>
<th>Center #3</th>
<th>Center #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circles</td>
<td>Jose E.J., Tony</td>
<td>11:00</td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
</tr>
<tr>
<td>Squares</td>
<td>Gloria, Mike</td>
<td>11:45</td>
<td>11:00</td>
<td>11:15</td>
<td>11:30</td>
</tr>
<tr>
<td>Triangles</td>
<td>Chris, Claudia</td>
<td>11:30</td>
<td>11:45</td>
<td>12:00</td>
<td>11:15</td>
</tr>
<tr>
<td>Diamonds</td>
<td>Tom Jeff</td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
<td>12:00</td>
</tr>
</tbody>
</table>
Rotation Example #6

The rocket group only has one student. This should be done carefully. There are times that a student would prefer to work individually but often working with at least one other student is an incentive. If two students on different levels are grouped together for this purpose you could split the direct instruction time between the two or as mentioned before have the faster student, at least at times, work with the slower student to build success and self-esteem. It is also helpful to place slower students in the group that work with the teacher first. This gives them the most structure when their attention is best and also places their free time at the end of the math period when they may have less concentration.

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Students Names</th>
<th>Center #1 (Teacher)</th>
<th>Center #2 (Reg. Activity)</th>
<th>Center #3 (Cut/Paste)</th>
<th>Center #4 (Free Play)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockets</td>
<td>Chris</td>
<td>11:00</td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
<td></td>
</tr>
<tr>
<td>Boats</td>
<td>Claudia E.J.</td>
<td>11:00</td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
<td></td>
</tr>
<tr>
<td>Cars</td>
<td>José Tony Mike</td>
<td>11:30</td>
<td>11:45</td>
<td>12:00</td>
<td>11:15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:45</td>
<td>12:00</td>
<td>11:15</td>
<td></td>
</tr>
<tr>
<td>Motorcycles</td>
<td>Jeff Tom</td>
<td>11:15</td>
<td>11:30</td>
<td>11:45</td>
<td>12:00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:30</td>
<td>11:45</td>
<td>12:00</td>
<td></td>
</tr>
</tbody>
</table>
student, at least at times, work with the slower student to build success and self-esteem. It is also helpful to place slower students in the group that work with the teacher first. This gives them the most structure when their attention is best and also places their free time at the end of the math period when they may have less concentration.

D. CENTER MATERIALS

Each center has a box where a child places his folder. The folders should be color coded; a different color for each group. If shapes are used for the group names the folders could also have the shape on it. The folder contains the work for each center. Each day after the child or small group works with the teacher she shows and explains their assignments for the Rug Activity and Table Activity Centers. The teacher gives the students the needed materials and clips the corresponding activity card to a student's folder. At the beginning of each center time the aide, if available, can use the card to refresh the student's memory about their individual assignments. Many of the Table Activities will have a finished example with them, as well as a picture coded direction card. If possible these should all be laminated.

All of the above-mentioned procedures are aimed at having the student work as independently as possible.
**Direction Card Holder**

The direction cards have a special holder. It can be made to sit on the table at the Table Activity Center or to hang on the wall nearby.

**TABLE**

**WALL**

The finished holders need to allow room to slip in 8 1/2" by 11" direction cards. Whichever type you use two of that kind need to be made.

**Materials**

<table>
<thead>
<tr>
<th>One Table Holder</th>
<th>One Wall Holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stiff cardboard</td>
<td>1 piece</td>
</tr>
<tr>
<td>3 pieces</td>
<td>9 1/2&quot; by 12&quot;</td>
</tr>
<tr>
<td>1 piece</td>
<td>9 1/2&quot; by 6&quot;</td>
</tr>
<tr>
<td>1 roll</td>
<td>Colored book binding 1 roll</td>
</tr>
<tr>
<td></td>
<td>tape 1&quot; wide</td>
</tr>
<tr>
<td></td>
<td>Picture hanger 1 set</td>
</tr>
<tr>
<td></td>
<td>eye and hook</td>
</tr>
<tr>
<td>Clear plastic</td>
<td>9 1/2&quot; by 12&quot;</td>
</tr>
<tr>
<td>1 piece</td>
<td>1 piece</td>
</tr>
</tbody>
</table>
Table Holder

Take one piece of stiff cardboard and the one clear plastic sheet. Use the book binding tape to secure them together along the 12" sides.

Use 1/2" of the tape on the front and fold it and have 1/2" on the back.

Lay out all the cardboard pieces as shown.

With 1/8" between the pieces, connect them to each other with book binding tape. Use strips 20" long for each connection and cover...
both front and back. Fold to make the finished product look like this.

The tape opening is to slip in the direction cards.

Center Boxes for Folders

Ideal size 10" wide x 12" high x 6" deep.
(Except for Rug Activity Center - 12" wide x 12" high x 12" deep).
(Boxes can be covered with colorful contact paper).

Suggestion: Make a pocket for the front of the box for the Activity Card for that center.

Folders

Ideal size when finished 10" wide x 13" high. Made from the large pieces of folded construction paper:
Or buy folder with pockets (27 cents at K-Mart).

**Direct Instruction Center**

Materials needed:
- Teacher's chair (swivel or on rollers if possible).
- Table area for students to work (Four student's maximum).
- Table for teacher's materials.
- Large book shelf for center materials.
- Designated boxes for:
  - Student folders.
  - Table folders center activity sheets.
  - Rug Activity Center sheets.
  - Manilla folders for Rug Activity manipulatives.
  - Storage of manipulatives.
  - Teacher's supplies:
    - Stapler, ruler, scissors, masking tape, markers, stickers, paper clips, and pencils.
  - Green Kindermath card box.
  - 3 Ink Pad Stamps - Match, Recognition and Recall.
    (You can have them made for about $3.00 each.)
Physical Management

An ideal placement for the Teacher's Center is again having eye contact with all other centers. The arrangement of the Teacher's Center must be done with care to make sure all materials are easily accessible, and well organized. The area where the students work should be free from clutter and distracting elements. The following arrangement is helpful.

![Diagram of Teacher's Center arrangement]

Box For Daily Files

Ideal size 12" wide x 8" high x 5" deep. This box is facing the teacher so she has easy access. It contains the progress charts for each small group. (The teacher's files can also be coded by the group's color and shape.) As each group works with the teacher this progress chart is taken out and the daily progress is recorded. It also shows the teacher where the group
ended the previous day and what card level from the Kindermath Box is to be worked on next. (See Example 7).

**Daily Progress Charts**

Example 7 shows the yellow circle group with the three students Jose, E. J. and Tony. They passed the green objective test card for I. Same/Different on Monday (M) 10-1-84. They took the test (green card) for II. Patterns/Concepts on Tuesday (T) 10-2-84 and did not pass it. On Wednesday (W) 10-3-84 they began working on card Level 11 from the Kindermath Box but were not finished. The same day 10-3-84 the Match Activities for card 11 were done. (The Activity Cards give activities for both the Rug Center and the Table Center. They also designate match, recognition and recall activities when it is applicable). On Thursday (Th), 10-4-84, the group worked again on Level 11. At the center recognition activities were done. On Friday (F), 10-5-84, all of the group passed Level 11 and the recall activities were done at the Rug and Table Centers.

On Monday, 10-8-84, the yellow group will start Level 12 and do the corresponding activities from the Activity Card at Centers #2 and #3. It is possible for a group to spend only one day on a level and then only one day's activities will be chosen for Centers #2 and #3. On the other hand a group may need to spend longer than 3 days on a given level. In that case some activities can be repeated, variations to the same activities can be given or new activities can be generated to reinforce the same concept.
being worked on at that level. If the teacher makes new activities due to the need of additional work on a given level, it would be good to add this to the Activity Card and run off copies and file them in the Activity Worksheet Boxes.
<table>
<thead>
<tr>
<th>OBJECTIVE</th>
<th>DATE</th>
<th>PASSED</th>
<th>MATCH</th>
<th>RECOGNITION</th>
<th>RECALL</th>
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</thead>
<tbody>
<tr>
<td>I. SAME/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIFFERENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td></td>
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</tr>
<tr>
<td>1 to 10</td>
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<td></td>
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<td></td>
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<tr>
<td>II. PATTERNS/</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONCEPTS</td>
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</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 to 18</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Objective</td>
<td>Date</td>
<td>Passed</td>
<td>Match</td>
<td>Recognition</td>
<td>Recall</td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>--------</td>
<td>-------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>Objective Test Card</td>
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<td>Same/ Different</td>
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<td></td>
</tr>
<tr>
<td>Level 1</td>
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</tr>
<tr>
<td>Level 2</td>
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<tr>
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<td>Level 4</td>
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- **ACTIVITY CARD**

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PROGRESS CHART (Continued)

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Student Folder - Center #1 Insert

This insert is taken out each day when the student comes to the Direct Instruction Center #1. (See Example 8). The folder is then placed in the FOLDER Box.

The insert is made of either construction paper or poster board. Ideally it is covered with contact paper or laminated. This size is 8 1/2" by 11". An award chart is attached to the top. The bottom or back can be used as a work area. As the teacher is working with her small group she can give stickers for each correct response, for levels completed or for each day's work. This can be done differently for each group depending on their need for reinforcement.

Example 8
Box/File for Worksheets

Ideal size 12" wide x 8" high x 12" or more deep.

This box contains the worksheets described on the Activity Cards. They need to be clearly filed by level number. Two different kinds of file folders need to be designated: One for the Table Activities and one for the Rug Activities. (Use different colors of folders or color code by stickers). Example: File Level I Activities in a blue folder for the Rug Center followed by Level I Activities in a red folder for the Table Activities, then Level II blue folder and Level II red folder, etc.

If they are clearly filed the teacher, at the end of the 10 to 15 minute work time, while the others are cleaning up, can quickly and easily locate the papers needed. The papers can also be pulled the evening before and put in the progress folder for the next day. Another way is to pull consecutive papers for one week and place them in another folder behind the progress folder to be given out daily. The drawback to this is that the group may not need to complete all of the corresponding activities for each level if they have mastered the level in one day.

Box for Manilla Envelopes for Rug Activity Manipulative

Ideal size: 10" wide x 12" high x 6" deep.

Each student needs 4 to 6 manilla envelopes with his name and group symbol clearly marked on them. They will be stored in this box and used to put the manipulatives in for the Rug Activities.
Depending on the size of the group this can be done at the end of the teacher's work time with that group or the envelopes can be prepared the evening before by the teacher or the aide. The directions for what goes into the envelopes is on the Activity Cards that correspond with each level taught. More than one activity may be assigned for one day. In that case put each separate activity into a different envelope.

The manipulatives often correlate with a worksheet in the Rug Activity Worksheet Box as well. The sheet can also be put in the envelope. The Activity Card itself can be clipped on the box where the folders are put for the Rug Center. The Card will help the aide in facilitating the work at this center.

Rug Activity Center #2

Materials needed:
- Large rug area.
- Individual rug mats 12" x 16" approximately. (Approximately 16 for a group of 8). (Local merchants may donate them if you ask).
- Storage area for the mats.
- Number line 1 to 10 (mounted on wall at floor level).

There are children who will have trouble changing from one activity to another independently. For the Rug Activity Center individual rug mats can be layed on the floor in a straight row. The student's manilla work envelopes can be placed one on each mat. The student is directed where to begin and is told to finish the work in each envelope and then go on to the next one. The
work on each rug is to be left out until the aide or teacher checks it.

This procedure can be taught step by step. Place masking tape on a line on the floor where the mats are to go. Give the student the correct number of mats and help him lay them out on the tape. Give the student his manilla folder and help him lay them out, one per mat. After doing the complete process together for several days have the student place the manilla envelopes independently. When that is done successfully the next step is to lay the last rug down independently. Follow this with giving the student the correct number of rugs to lay down without help. Next, put small dots of tape on the floor to correspond with the number of rugs needed. The student, first with help and then independently, gets enough mats to cover each dot and then lays his envelopes on top. At clean up time after his work is checked the process is reversed. Depending on the level of the child he may eventually be able to count the number of envelopes and then count how many rugs he will need. This procedure can be taught to all of the students if it seems necessary. The key is to (1) Demonstrate the process; (2) Do the process together; (3) Break the process into small steps; (4) Do all but the last step of the process together; and, (5) Continue to add one step at a time until the student has mastered the whole process independently.

In all the steps be sure to praise the child for what he can do. "Chris you layed out your envelopes all by yourself today. You did a good job." "Chris thank you for helping me lay out the
rugs so carefully." "You got the right number of rugs all by yourself. That's great!"

The goal is for each student to be able to develop independence and responsibility. Structure and routine help this process. So in this case as soon as a student can do the complete process independently allow him to do so. This also builds his self-esteem.

Table Activity Center #3

Materials needed:
- Table with area for at least 4 to work.
- Book shelf to store:
  - scissors
  - glue
  - newspapers
  - pencils
  - playdough
  - crayons, etc.
- Holder for daily sequenced picture directions.
- Tape recorder and Head Set equipment for 4 students.

Free Play Center
- Trucks, cars, etc.
- Play dishes;
- Blocks;
- Sandbox or cornmeal box;
- Puzzles;
- Paints, easel;
- Brushes;
- Clay, plastic mats, cookie cutters, etc.;
- Games;
- Nesting Toys;
- Number line 1 to 10 (mounted at floor level or on the wall with a pocket under each number);
- Beads to string;
- Nuts/Bolts;
- Small plastic pipe fittings;
- Number line (on wall at floor level), numbered sets of objects to match to the number line:

<table>
<thead>
<tr>
<th>Clothespins</th>
<th>Pennies</th>
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<tbody>
<tr>
<td>Cars</td>
<td>Sticks</td>
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<tr>
<td>Cups</td>
<td>Small plastic pipe fittings (when screwed together make a number line)</td>
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<td>Saucers</td>
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</table>

- Facilities for water pouring.

This list could be endless. (See Appendix for more ideas).

Not all items need to be available each day. Neat storage is important to allow for the student to independently use and return materials. Shoe boxes with the picture of contents on the end is helpful for small items. More expensive but useful are the clear plastic shoe boxes.

Overview of the Center System

The room is conveniently organized with all supplies needed for each center ready and available. The first days or weeks are spent with the total group rotating - to Centers #2, #3, and #4.
During this time the rules and procedures are demonstrated and practiced until they are firmly established.

The children are tested in the Kindermath Program and grouped into four groups of similar functioning. A large rotation chart is made. Practice is done with each group rotating to each center. The groups rotate to each center daily with their folders. The folders contain their work for each center. The first few days of group rotation may require more help from the aide in explaining the assignment. Eventually the teacher will basically explain the Rug Activity assignments and the aide will explain the Table Activity assignments although they are structured for independent work.

Each center is 10 minutes long and can be longer if this is desired. The teacher sets the time for 10 minutes. The teacher works with a small group at her center. The aide moves around to facilitate the work at the other centers. The students at the other centers are each working independently.

When the timer rings the students begin cleaning up. The teacher sets her timer for 5 minutes and finishes up with her group. When the children are finished they sit quietly at their center with their folders. The aide and teacher rotate around and check student's work and give stickers and verbal praise. When the timer rings again everyone should be cleaned up and have their folders.
When everything is done the teacher asks them all to stand quietly and then to rotate with their folders to their next center. They all rotate clockwise to the next center.

When the student comes to the Teacher's Center they take out the Teacher's Center Card #1 and put their folders in the box on the desk. The teacher works with each group according to where they are on their progress chart. The teacher takes out the indicated card and materials from the Green Kindermath Box on her table. When the 10 minute timer rings (or before) the teacher gives her small group their assignments and materials for Centers 2 and 3.
SPECIALY DEVELOPED MATERIALS
ACTIVITY CARDS

Getting Started

The Activity Cards give suggested activities for both the Rug Center and the Table Center. The teacher needs to make sure a supply of the corresponding worksheets are run off and filed in an organized manner, as well as organizing the needed manipulatives. The Activity Cards are a different color from the regular Direct Instruction Cards and are filed in the green plastic storage box following the level to which it belongs. If needed two of each Activity Cards can be made so at least two groups can be working on the same level on the same day.

Step by Step Process

(1) The students rotate to each center daily. When they are at the Teacher's Direct Instruction Center they are working from one of the level cards in the green plastic storage box.

(2) At the end of the lesson the teacher takes the Activity Card corresponding to the lesson taught that day. The teacher pulls the needed worksheets and manipulatives from organized boxes within her easy reach.

(3) The teacher explains the activities for the Rug Center and the Table Center.

(4) The worksheets are stamped Match, Recognition, Recall.
(5) The Rug Center manipulatives are put in a manilla envelope for the student to take with him. The Table Center worksheets are put in each student's folder.

(6) The teacher also marks each student's folder with the level and activity worked on (See Example #7).  

(7) Before the group rotates from the Teacher's Direct Instruction Center to the Rug Activity Center and then on to the Table Activity Center the Activity Card for the group is clipped to one of the student's folders.

(8) When the group goes to each center their Activity Card will be put in the pocket on the outside of the folder box of that center. From there the aide is able to pull the card and assist the work at each center.

As will be seen, many of the activities can be used for either Match, Recognition or Recall activities. Some of the differences are in the type of questions asked by the facilitator as the student is working. Probably an aide or volunteer will be asking the questions as the students are working on the activities at the Rug and Table Activity Centers. The teacher will have stamped Match, Recognition or Recall on the student's paper. The aide needs to be trained in the concept of Match, Recognition and Recall. Examples will be on each Activity Card. Below are some examples as well. It is crucial that this concept is fully understood in order to present to each student work he can accomplish successfully.

-66-
Examples:

**Match:** Show the student a spoon. "Show me your spoon." Hold up a numeral one. "Show me your numeral one." (The student only needs to match what you have showed him.)

**Recognition:** Show me a spoon. (You have said the name of the object. The student needs to recognize which one is a spoon). "Show me a numeral one."

**Recall:** Holding up an object "What is this?". (You have given the student no verbal clue. He must totally recall the information that the object is a spoon).
ACTIVITY LEVEL: 1
CARD: MATH CARD: 1
OBJECTIVE: Identify Objects by Name

RUG ACTIVITY
Match objects to their outlined form on paper.

TABLE ACTIVITY
A. Color the object forms on paper.

MATERIALS:
- Worksheets
- Bag of objects (Put in a manila envelope)

FACILITATOR:
- Match: Hold a spoon - "Show me a spoon", etc.
- Recognition: Show me your spoon, etc.
- Recall: Hold up an object. "What is this?" Continue with all the objects.

NOTES:
- Give the child as many worksheets as you think he can complete in 10-15 minutes. This may differ for the Rug Activity and the Table Activity. The child probably can match more worksheets than he can color.
- If the child needs more practice with this activity more worksheets can be made with different objects.
- Also if a child can accomplish it a large cardboard can be made with the forms of many objects to match. A duplicate of this can be available at the Free Play Center.

ACTIVITY LEVEL: 1
CARD: MATH CARD: 2
OBJECTIVE: Identify Objects by Name

RUG ACTIVITY
A. Sort objects.

TABLE ACTIVITY
B. Paste forms of objects already cut out. (A more difficult process is to cut the forms out and paste them. Only do that if the child is ready for that many steps).

MATERIALS:
- Worksheets containing the form of one object per paper.
- Large assortment of objects (several of each kind in a baggie).
- Worksheet with objects. (Can be already cut out by teacher).
- Colorful construction paper.

FACILITATOR:
- Match: Holding up a popsicle stick - "Show me your stick", etc.
- Recognition: "Point to your stick."
- Recall: "What is this?"

NOTES:
- Again try to judge the amount of work each student can complete in 10-15 minutes. Some students may need two envelopes for the Rug Activity.
OBJECTIVE: Identify Objects as "The Same"

**RUG ACTIVITY**

A. Match objects to forms on worksheets.

B. Sort objects.

**TABLE ACTIVITY**

A. Use glue to outline forms. Add: Beans, glitter, sand, etc.

B. Vary #A.

**MATERIALS:** Worksheets

Objects: Glue, glitter, beans, etc.

C. Sort material squares. (Put the same ones together.)

C. Use lids of cottage cheese make matching sets. Paste material circles in them. Paste pictures on them.

D. Sort pictures. (Put the same ones together.)

D. Paste or cut and paste pictures together.

**MATERIALS:** Worksheets

Material squares/circles

Pictures (Dittoed or magazine)

Glue

Cottage Cheese tops

Construction Paper

**FACILITATOR:***

Match: This is a clothespin. This one is the same. You choose one that is the same.

Recognition: This is a spoon. Point to one that is the same.

Recall: Find two that are the same.

**ES:**

To match pictures you can buy 2 of each magazine such as Life or Sesame Street. You can tear out one identical page for an advanced student to cut objects that are the same and paste them together on a paper. To make additional pictures that are dittoed you can get coloring books with interesting objects to copy.

Be conscious not to give a student more items to sort than he can do successfully. Two short sorting jobs in separate bags may be more manageable.
ACTIVITY: MATH
JECTIVE: Identify Objects as "The Same"

RUG ACTIVITY
More Difficult

E. Sort colored cellophane squares or construction paper squares.

TABLE ACTIVITY

E. Pre-made or make poster paper glasses. Use colored cellophane paper for the lenses.

TERIALS:
- Colored construction paper
- Colored cellophane paper cut in squares
- Pre-made glasses/or to make glasses pattern
- Poster paper (stiff paper) for glasses

L.CILITATOR:
(Sample dialogue)
- Match: "This is a blue square." "The blue one in your hand is the same."
- Recognition: "This is a blue square." Find one that is the same."
- Recall: Find two squares that are the same."
ACTIVITY: MATH
OBJECTIVE: Identify Objects as "Not The Same"

RUG ACTIVITY
A. Continue activities from levels 1 and 2 using "not the same" language.
   - Match objects, pictures and materials.
   - Sort objects, pictures and materials.

B. Sort cards from card games. Use number 1-5 all of the same color.

MATERIALS: Number cards and number worksheets

C. Sort stack of shapes
   - Sheets with shapes on it. Draw one that is not the same. Have concrete shapes to trace.

MATERIALS: Construction paper shapes
   - Blocks of different shapes
   - Shape worksheets

FACITITATOR:
(Activity B)
   - Match: "Here is card #1." "Here is one that is 'not the same'." "Give me one that is 'not the same'."
   - Recognition: "Here is card #1." "Find one that is 'not the same'."
   - Recall: (Aide) Choose two cards that are 'not the same'. "Tell me about these cards."

Uses:
At this point it is important to have items that only differ in one aspect. (Example: They differ in shape or color, but not both).

In Activity B use only as many cards as can be done successfully.

If more work is needed continue to vary the above activities.
RUG ACTIVITY

Sort objects/pictures. Baggie of objects in it. All are the same but one. The bag also contains a card to match most of the objects. (Example: Card with a spoon on it. All the objects in the bag match exactly except their is one block or fork, etc.

TABLE ACTIVITY

A. Worksheet with rows of objects or shapes. Color the one that is different.

Variations: Worksheet with clown faces. Precut or cut and paste a hat on the clown that is different. Cars - cut and paste wheels on the car that is different. Indian faces - cut and paste a feather on the Indian that is different.

MATERIALS:

Worksheets

Many combinations can be made:
- Nuts/one bolt
- Keys/one lock
- Spoons/one fork
- Pencils/one eraser
- #4 playing cards/one #2 card
- Yellow forks/one red fork
- Red blocks/one purple block
- Blocks/one ball
- Red plastic paper clips/one blue one
- Plastic paper clips/one metal one
- All the same material squares/one different
- Buttons/one different

CILITATOR: (Sample dialogue)

Match: The spoons are in the bag. The fork in my hand is different (lay it down). Pick up the one that is different.

Recognition: "All of the spoons are the same as the card. This fork is different. What else is different?"

Recall: "Look at all the objects." "Show me the one that is different."

NOTES:

Again, be sure they differ in only one aspect. Make sure the differences are obvious.

A variation is to have two of one object and more of another. (Example: Six spoons and two forks.) The bag contains one card to match the spoons. The student then finds the two that are different. This allows for the Recognition stage.
ACTIVITY LEVEL: 4
OBJECTIVE: Identify Objects which are "Different"

RUG ACTIVITY
Stamp kit (could be money). Have papers approximately 5 x 4 cut. Student stamps objects on paper that are all the same except one. (If needed give the student only two stamps). Also you could give the student papers that are already stamped with objects and the student stamps the one that is different.

TABLE ACTIVITY
B. Worksheet with rows of objects or shapes. From another paper cut and paste over the object that is different.

Variations: Have black rectangles on the table that could cover the objects. Paste a black rectangle over the one that is different.

A more complicated form is to have one object on the side and to mark or color all the ones that are different from that one.

MATERIALS:
Stamp kit
5 x 4 papers
Worksheets

FACILITATOR:
Match: The aide takes a paper and stamps three of one object. She then stamps one of a different kind and says, "This one is different. Stamp another one that is different."

Recognition: Aide stamps three of one object and asks the student to stamp on that is different.

Recall: "On this paper stamp three that are the same and one that is different."
Developing Further Materials

The goal in developing the worksheets and activities is to provide materials that are common to a child's world or of potential high interest. Another feature is to provide a wide variety of appropriately simplified materials so those slow students who will be on one level for a long period of time can learn the same concept with "new" materials. In creating additional materials for these units it is important to emphasize the concept of presenting simplified tasks and advancing slowly. An example of this are the four following pages. The first, a typical primary worksheet, the second, third and fourth are adaptations. These are the things to watch.

PICTURE 1

(1) The direction language, "does not belong" was not introduced before in the booklet.

(2) In the booklet there are only four such pages with these directions and formats.

(3) Many learning handicapped students would have trouble distinguishing "each line".

PICTURES 2 and 3

(1) The direction language, "different" was introduced in the Teacher Directed Lesson with that level immediately before the activity and is repeated consistently.

(2) This format will be used repeatedly.

Pages 2, 3, and 4 all block out the work clearly and show the difference in difficulty level.
Picture 1

(1) The direction language, "does not belong" was not introduced before in the booklet.

(2) In the booklet there are only four such pages with these directions and formats.

(3) Many learning handicapped students would have trouble distinguishing "each line".

In each line put an X on the picture that does not belong.

- Desk - Desk - Easel - Desk

- Brush - Pencil - Brush - Brush

- Easel - Easel - Sharpener - Easel

- Pencil - Pencil - Pencil - Desk

- Sharpener - Brush - Sharpener - Sharpener
PICTURES 2 and 3

The direction language, "different" was introduced in the Teacher Directed Lesson with that level immediately before the activity and is repeated consistently.

This format will be used repeatedly.

Pages 2, 3, and 4 all block out the work clearly and show the difference in difficulty level.

Worksheets in sequence according to difficulty level.

Teacher Directed Lesson

LEVEL: 4

OBJECTIVE: Identify Objects which are "Different"

MATERIALS: 2 of each: clothespins, bears, blocks, kittens

PROCEDURE: Place a bear on the table. 

Put all other objects hidden. 

Allow child to look at, touch and name the bear (if possible). 

Hold up from three objects and say "different" (clothespins). 

Say, "Pick up one that is not the same." 

Allow child to point to the one and say, "Yes, it's not the same." 

Encourage child to say that the things are different or not the same. 

From this point aid gradually begin using the term "different." 

Place a cup next to the bear. 

Again, hold up the clothespins and say, "Pick up one that is different." 

Then say, "Pick up another one that is different." 

If there is difficulty, talk about the objects, saying "These things are different because..."

(continued)
EVALUATION

The above behavioral management rotation system has been used effectively in a Learning Handicapped Special Day Class with students age 5 to 10. In ability these students ranged from Mentally Retarded (M.R.) to high/average Severely Emotionally Disturbed (S.E.D.). Each student did get daily instruction on his ability level, was able to achieve success on his own level, and to develop a sense of responsibility.

Recommendation/Limitation

I, firstly, would recommend that the behavior rotation system be evaluated by setting up this program in several learning handicapped classrooms. Admittedly, because of the wide variety of programs, teaching styles, and differing student populations it would be hard to eliminate the variables in such a study.

Due to the enormity of the tasks and the constraints of time the Activity Card part of the curriculum was only begun.

The cards and materials that were developed were done in a very detailed manner in order to develop the concepts involved as clearly as possible. But here my second recommendation is that Activity Cards and materials be developed for the total Kindermath Program, and that this be implemented on an experimental basis in several learning handicapped classrooms.
FOOTNOTES

1COPE Kindermath (Mathematics Objectives).


3San Bernardino Superintendent of Schools, East Valley Special Education Department, Local Plan Area 1982-83.

4Ibid.

5Ibid.

6Ibid.

7Donald D. Hammill and Nettie R. Bartel, Teaching Children With Learning and Behavior Problems (Boston, Mass.: Allyn & Bacon, Inc., 1978), p. 130.

8Ibid.


14Molly Brearley, The Teaching of Young Children, (Some Applications of Piaget's Learning Theory), p. 3.

15Ibid., p. 3.

16Donald D. Hammill and Nettie R. Bartel, Teaching Children With Learning and Behavior Problems, p. 101.

18 Ibid., p. 289.
19 Ibid., p. 297.
20 Ibid., p. 289.
23 Ibid., p. 101.
26 Ibid., p. 274.
27 Ibid., p. 278.
30 Ibid., p. 424.
32 Jim Pierce, oral presentation and handouts at Redlands Diagnostic Center, Redlands, California, 1981; also class presentations (1961) at Cal State San Bernardino.
33 Ibid.
34 Ibid.
37 Sally Lucas, "Characteristics of the EMH Child - Needs and Implications," class handout.
38 Elaine Holland Eudy, "The Effectiveness of a Mathematical Device Called a Tryab on the Arithmetic Achievement of Primary Students" (Ed.D. dissertation, University of Mississippi, 1973), p. 22.

39 Ibid.


42 Robert Harvey Matlow, "The Effects of Token Reinforcement and Task Analyzed Program on the Acquisition of the Children with Low Mathematical Abilities" (Ph.D. dissertation, University of Southern California, 1976).


46 Robert Harvey Matlow, "The Effects of Token Reinforcement and Task Analyzed Program on the Acquisition of the Children with Low Mathematical Abilities" (Ph.D. dissertation, University of Southern California, 1976).


48 Ibid.

49 Jim Pierce, Oral presentation at Redlands Diagnostic Center, Redlands, California 1981.
COPE Cognitively Oriented Pre-Primary Experience, (Early Learning Inc., Devon, PA 1982).

Ibid.
BIBLIOGRAPHY


Justen, Joseph E., III, Reichard, Cary L. and Gronis, Terry G. *Creative Teaching of the Mentally Handicapped*.


Maltzi, Max, M.D. *Psychocybernetics* (tape). Waco, Texas.


Pierce, Jim. Oral presentation at Redlands Diagnostic Center, Redlands, California, 1981.


San Bernardino Superintendent of Schools, East Valley Special Ed. Dept.


SPECIALY DEVELOPED MATERIALS
Level#1 Card
Rug Activity
Level #2
Card #1
Table Activity
Find one that is "The Same"

(Can be precut by teacher)
instructions:
1. Cut
2. Paste

name: ___________________________

fold while working
brush

sharpener

pencil

easel

Cut
<table>
<thead>
<tr>
<th></th>
<th>WOMEN</th>
<th>WOMEN</th>
<th>men</th>
<th>men</th>
<th>peanuts</th>
<th>peanuts</th>
<th>women</th>
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<tbody>
<tr>
<td></td>
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<td>hot dog</td>
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<td>men</td>
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</tr>
</tbody>
</table>

*Color the one in each row that is different.*
Developmental Curriculum Model

I. Perceptual-Motor Development
   A. Sensory Perception and Discrimination
      1. Visual Perception and Discrimination
         a. visual discrimination
         b. visual patterning and sequencing
         c. visual memory
      2. Auditory Perception and Discrimination
         a. auditory discrimination
         b. auditory memory
      3. Tactile Perception and Discrimination
      4. Olfactory and Gustatory Perception and Discrimination
   B. Perceptual Integration
      1. Tactile-Visual Integration
      2. Tactile-Auditory Integration
      3. Visual-Olfactory/Gustatory Integration
      4. Tactile-Gustatory/Olfactory Integration
   C. Fine Motor/Eye-Hand Coordination
   D. Gross Motor Coordination

II. Conceptual-Language Development

III. Socio-Emotional Development

IV. Achievement
   A. Reading
   B. Mathematics

V. Enrichment Activities
   A. Social Studies
   B. Science
   C. Health/Safety
   D. Art
   E. Music
   F. Cooking
Early Learning introduces...
KINDERMATH II™, the first software math system with
"Talking Teddy" voice synthesizer
for ages 4-7

series of 10
niquely-designed
math skills disks
ased on a
tationally-validated
gram for school
r home use.
purchase the entire
ystem or buy
e disk at a time.

Disk #1 - Same and Different
Teddy introduces math vocabulary and
terminology, teaching the meaning of
same, different, and set as well as the
names of the graphics shown throughout
KINDERMATH II™. "Talk Teddy" in-
struction and the easy to use joystick,
children can identify and locate the
colorful attention-holding graphics that are the
same and different. They can also create their own sets.

Disk #2 - Patterns and Concepts
Teddy teaches children how to copy a pattern by
using the joystick to move pictures on the
screen. One-to-one correspondence is taught.
Concept of empty set is also taught using this creative
format.

Disk #3 - Sets 0 to 5
Teddy teaches children how to recognize what
a set is, by matching it to a set of pictures on the
screen. The child then must use the joystick
to make their own set.

Disk #4 - Numerals 0 to 5
Teddy teaches children how to recognize the
numerals 0 to 5. The child must match up the
correct numeral to the picture on the
screen.

Disk #5 - Shapes
Children learn to make the shapes "see"
by matching them on the screen. Teddy
invites them to move the joystick to find the
shapes he names.

Disk #6 - Sets 6 to 10
Children learn to recognize the numerals 6
through 10 in a lively format.

Disk #7 - Numerals 6 to 10
Teddy teaches the math signs equal (=),
less than (<), greater than (>), and
not equal (=). These different
signs and concepts are introduced in a
creative way by encouraging children to
see the signs to make their own sets.

Disk #8 - Math Signs
Teddy teaches children how to recognize the
math signs equal (=), less than (<),
greater than (>), and not equal (=). The child
learns to use the joystick to make the
math signs move on the screen.

Disk #9 - Addition and Subtraction
Children learn the concepts of addition and
subtraction with Teddy's help.

Disk #10 - Math Skills Assessment
(primarily for school use) This series
of math activities are designed to help
determine the child's skill level in
KINDERMATH II™. Teddy presents a
number of activities which assess
the concepts of same and different,
more and less, shapes, sets, and
colors, numbers 0 to 10, math signs, addition
and subtraction.

KINDERMATH II includes these outstanding features...

- easy to use joystick instead of keyboard;
- Teddy talks through headphones or
  speakers;
- child-centered, interactive, built-in
  praise and access;
- self-paced, requires little or no adult
  supervision;
- developed by a team of creative
  educators and programmers.

About Early Learning, Inc.

Today, parents and educators, nationwide, are demanding high quality
educational software. Early Learning, Inc. represents the latest in
both educational software for the home and for the classroom. The
Early Learning educational staff — with
more than two decades of experience in educational improvement and
curriculum development — has conducted educational seminars
throughout the U.S. and abroad.

The Early Learning programming staff is responsible for incor-
porting the latest advances in technology, speech synthesis, and high
dimensional graphics into software programs. The staff continuously
explores the latest advances in technology to ensure that only the very
best techniques are available through Early Learning software systems. Early
Learning, Inc. is committed to meeting this challenge with excellence in
educational software.
FIRST LEVEL MATHEMATICS

KINDERMAHT
A Nationally Validated Developer/Demonstrator Project

ANNOUNCING A KINDERMATH WORKSHOP
for Educators of KINDERGARTEN, FIRST GRADE,
and TRANSITIONAL STUDENTS

KINDERMAHT I:
- 90 sequenced math lessons (from same/different to addition/subtraction)
- easy-to-administer math placement test
- objectives checklist
- manipulatives for lessons
- also in Spanish version

KINDERMAHT II:
- 90-lesson software system based on KINDERMATH I
- uses a voice synthesizer and joystick; does not require reading skills
- Assessment of Math Skills Disk
- self-paced; repeats lessons or advances to next
- scores for each lesson displayed on screen/printout

Format:
2 1/2 hour "hands-on" workshops
Select either the morning or afternoon session below.

When & Where:
Mon. Oct. 8 San Diego Area Pat Roberts
9-11:30 a.m. To be announced 215-688-7993
1-3:30 p.m.

Tues. Oct. 9 Imperial Cty TECC Margie Atwood
9-11:30 a.m. El Centro, CA 619-339-6463
1-3:30 p.m.

Wed. Oct. 10 Los Angeles Cty TECC Pat Roberts
9-11:30 a.m. Downey, CA 215-688-7993
1-3:30 p.m.

Fri. Oct. 12 Santa Clara Cty Inservice Dale Dana
2 one-hour presentations San Jose, CA 408-947-6898

Sat. Oct. 13 5th Fall CUE Conference LeRoy Finkel
10:30 a.m. San Jose, CA 415-563-5472
11:30 a.m.

Mon. Oct. 15 Modoc County Bob Anderson
9-11:30 a.m. Office of Education 916-233-5166
1-3:30 p.m. Alturas, CA

Tues. Oct. 16 Butte County Linda Loftus
1-3:30 p.m. Office of Education 916-244-4600
Parkland, CA

Wed. Oct. 17 Lassen County Mary Lee Sizemore
9-11:30 a.m. Office of Education 916-534-4267
1-3:30 p.m. Oroville, CA

Thurs. Oct. 18 Shasta County Gerri MacIntyre
1-3:30 p.m. Office of Education 916-257-2196
Susanville, CA

For Reservations: Call the contact person named above. Spaces are limited!
so make your reservation early!

FOR INFORMATION ON SCHEDULING A JANUARY 85 WORKSHOP IN YOUR AREA
RETURN THE COUPON BELOW TO:
Patricia Roberts, KINDERMATH
P.O. Box 791
Devon, PA 19333
215-688-7993

KINDERMAHT WORKSHOP INFORMATION FORM (for week of 1/21/85)

NAMES/POSITIONS
OF PARTICIPANTS:

DISTRICT OR AGENCY:
SCHOOL NAME:
SCHOOL ADDRESS:
CITY: STATE/ZIP:
# MATERIALS ORDER FORM

**PURCHASE ORDER NO.** ______________________  **DATE** —________

**BILL TO:**

Name of Individual  
School or Agency

**SEND TO:** (If different from billing)

Name of Individual  
School or Agency

**Street Address**

City  
State  
Zip

**Street Address**

City  
State  
Zip

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**KINDERMATH II - A Software Program**

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**Subtotal**

**Add 10% Shipping**

**TOTAL**

**KINDEERMATH**

P.O. Box 701  
Devon, PA 19333
CENTER RULES, DIRECTION CARDS, PROGRESS CHARTS, AND OTHER FORMS AND CHARTS
<table>
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<tr>
<th>Mon.</th>
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<th>Center #4</th>
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<tbody>
<tr>
<td>Level</td>
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<tbody>
<tr>
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<td></td>
<td>Play</td>
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<td></td>
<td>Play</td>
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<th>Thur.</th>
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<th>Center #4</th>
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<tr>
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<td>Play</td>
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(MIGHTY AWARD MONSTER)
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<th>Students Names</th>
<th>Center #1 Teacher</th>
<th>Center #2 Rug Activity</th>
<th>Center #3 Cut/Paste</th>
<th>Center #4 Free Play</th>
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<td></td>
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<td>12:00</td>
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</tbody>
</table>
1. Glue

2. Glue

3. Glue

4. Glue

5. Glue
Center Rules

1. Work Quietly!
2. Do not talk to teacher.
3. Finish work.
4. CLEAN UP!
Hand Signs

Loud Voice

Soft Voice
# Basic Learning Concept for Reading and Spelling

**Perception** → **Integration** → **Expression**

- **Tactile** • **Auditory** • **Visual**
  - Feels • Hears • Sees
  - Perception
  - Memory: Short/Long
  - Sequence
  - Spatial Orientation
  - Discrimination
  - Figure Ground
  - Closure
  - Process Time

**Perception** — receives the visual, auditory or tactile clue from a stimulus; sorts so that new information is imprinted and previously stored information is retrieved.

**Expression**
- **Oral**
- **Written**
- **Gesture**

### Code Input → Decode Process → Encode Output

<table>
<thead>
<tr>
<th>Input</th>
<th>Perceives</th>
<th>Integration</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hears the word &quot;CAT&quot;</td>
<td>Use signing or picture for a deaf student for input</td>
<td>Student says &quot;CAT&quot;</td>
<td>Writes &quot;CAT&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auditorizes and/or visualizes to him/herself</td>
<td>Orally spells &quot;C A T&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gesture points to appropriate letters (I.E. A B C D E F G H I R S T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 1 3</td>
</tr>
</tbody>
</table>

### Match Recognition Recall

<table>
<thead>
<tr>
<th>Reading</th>
<th>Perceives</th>
<th>Integration</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sees the word &quot;BAT&quot;</td>
<td>Use Braille with a blind student for input</td>
<td>Student says &quot;BAT&quot;</td>
<td>A. Can tell about &quot;BAT&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auditorizes and/or visualizes to him/herself</td>
<td>1. Made of wood, aluminum, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Used in baseball</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Also an animal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B. Demonstrate use (pantomime)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C. Can write story about &quot;BAT&quot;</td>
</tr>
</tbody>
</table>
Giving people encouragement (positive feedback) about the performances they are doing well will stimulate an increase of those performances. In order to assure this quantitative response, the following rules must be observed:

**RULES**

1. Make the feedback refer to one specific performance.

2. Keep the encouragement pure — don't mess up the message with anything else.

3. For maximum effect, make the feedback positive about good performance. (Use silence on poor performance.)

4. Offer the encouragement immediately after the behavior has taken place, i.e. within 30 minutes of its coming to your attention.

5. At first, offer the feedback frequently — when the desired performance is in place, you can diminish the frequency.

6. Offer the feedback irregularly.

**RATIONALE**

Generalized compliments, e.g., "You're doing a great job," are received as backslapping and gladhanding — often seen as phony. They can damage your credibility.

Mixing your encouragement with advice causes people not to believe in your compliment.

By encouraging desirable performances, you will crowd out less desirable performances.

Giving your feedback soon after the desirable behavior makes clear what you are talking about. The pleasure of your compliment gets associated with the performance.

Frequency at first helps the person make certain that you are paying attention and approve. Later, the person will internalize this feedback, as you slowly diminish it.

If you always offer your encouragement at the same time, e.g. 10:30 Tuesday morning, you will probably find that people only perform for you just prior to your feedback — in anticipation. Offering encouragement irregularly, you can stimulate a continual increase.
RULES FOR PROVIDING EFFECTIVE ADVICE

By giving people advice, you can change the quality of their performance — the way they go about doing a thing. In order to assure that the advice you give is received and used, follow these rules:

**RULES**

1. Describe specifically the current performance you are trying to change.

2. State the specific change or different result you want.

3. Keep your advice pure. Don't try to soften it with compliments or distracting discussion of things being done well.

4. Offer your advice just before the person has an opportunity to use it.

5. Limit the scope of your advice.

6. Ask for feedback from the performer.

**RATIONALE**

The description of current behavior permits the person to know what you are talking about, and to determine if you are describing the performance accurately.

Specificity about what you want makes for clarity, especially when contrasted with your description of the current behavior. By following rules 1 and 2, you define the problem the person is to remove from their performance.

If you mix encouragement and advice, people question your sincerity and the necessity of following your advice.

By offering advice before the performance, the person has a chance to use it immediately, and you increase the likelihood that the advice will be seen as support rather than criticism.

Don't try to give too much advice at once. The more your advice can address one issue at a time, the more likely it is to be taken.

Unless you leave the door open for this feedback, the performer may fail to ask for clarification when it is needed.
<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>NEEDS/SUGGESTIONS</th>
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<tbody>
<tr>
<td>1. Limited attention span.</td>
<td>- Work in short blocks of time.</td>
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<td>- Alternate quiet work with physical activity.</td>
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<td>2. Often lacks qualities of judgment, logic, organization.</td>
<td>- Use specific directions.</td>
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<td>- Have organized materials and routine schedules.</td>
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<td>3. More limited ability to foresee the outcome of their actions.</td>
<td>- Needs a classroom environment where standards are firm and consistent.</td>
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<td>4. Compensatory behavior through aggression or withdrawal. Often gives up easily.</td>
<td>- Daily opportunities for success at all levels of ability.</td>
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<td>- Immediate reward meaningful.</td>
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<td>5. Difficulty in working with other children. Upset easily.</td>
<td>- Option and space available to work alone when he chooses.</td>
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<td>6. Confused with too many symbols.</td>
<td>- Simplify work sheets.</td>
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<td>- Block out distracting parts.</td>
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<td>- Give a visual model.</td>
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<td>- Use numbered boxes.</td>
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<tr>
<td>7. Limited transfer or learning from one activity to another. Difficulty learning abstract concepts.</td>
<td>- Opportunity provided to apply learning in many situations.</td>
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<td>- Practical, concrete materials are needed.</td>
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<td>- Relate learning to immediate daily living.</td>
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<td>- A multisensory approach is helpful.</td>
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</table>
MORE HINTS FOR TEACHERS

This child often:

1. Needs brief and specific directions with short-term, easily attained goals.
2. Cannot make choices easily—should be directed often.
3. Finds it difficult to work with other children. He may want to participate but gets into difficulty easily. If he is joining a group, give him specific directions beforehand.
4. Is usually bright, may understand but not respond reasonably well, so let him sit with reading groups and follow along by listening. Give answers orally.
5. Is confused with too many symbols—suggest simplified work sheets, particularly in math.
6. Has difficulty shutting out noise and movement. Find him a quiet corner to work in for some periods of the day.
7. Is interested and willing to work with a tape recorder and headsets if the tape is clear in its directions and work.
8. Is physically immature in hand, eye, and body coordination. Emphasis on games and activities leading to better coordination should be encouraged.
9. Is subtly rejected by his peers. Make an effort for him to belong.
10. Prefers to work at some tasks alone. This should not be ignored but encouraged where he finds it difficult to work with others.
11. Has a very short attention span. Needs to be checked on constantly.
12. Needs directions repeated quietly to him again after they have been given to the class. Have him repeat and explain directions to you.
13. Gets very upset. When this occurs it takes him a long time to "get in the groove." Give him freedom to move before he explodes.
14. Cannot read test questions or write the answers. Make arrangements to give him crucial tests orally. Does much better on multiple choice questions.
15. Cannot work under time pressure. Allow him time to work at his own pace. He will fall apart under pressure.
SUGGESTIONS FOR TEACHERS IN HELPING CHILDREN WITH LEARNING DIFFICULTIES

1. Give a child a small amount to do at one time.
2. Use concrete objects and simplify everything as much as possible.
3. Allow him to work slowly. If he can't copy from the board, give him the master copy you used when you put the work on the board.
4. Have the child work at a "clean desk" or table and facing a relatively bare wall or area. Clutter confuses or distracts this type of child. What to some children would be an interesting and stimulating bulletin board would be a confusing distraction to this child.
5. Keep your voice at a moderate and even level. The child with an auditory problem has just as much difficulty understanding shouted words as he does mumbled ones.
6. Try not to single out or focus attention on this child in front of his peers. A careless statement such as "I'll help you get started on your test later since I know you can't read the questions" can belittle this child and destroy his self-image and completely turn him off.
7. Plan ahead for the child who can't read so he can perform the same as other children. When the content is the important thing rather than reading practice (such as in a class of social studies) let him have the material read to him by a parent, older sibling, or school volunteer. Likewise, in instances where the content is the issue rather than the spelling or handwriting, let him dictate his own ideas to someone else to write down. The "Someone else" should be instructed not to make corrections or changes. In correcting a paper, mark only the important phase and do not take points off for errors that this particular assignment is not specifically involved with.
8. Structure the page for him. Give him a visual model he can follow using numbered boxes, columns, etc.
9. Give him credit for what he has done right instead of concentrating on what is wrong. He needs a great deal of encouragement and praise should be given when and whenever it is earned. Do not put marks of a demoralizing nature on his paper.
10. Allow this child to take tests orally and have a longer time allotment. Avoid surprise quizzes or timed assignments.
11. Have him use a bookmark to block out all but one line to reduce distractability.
12. Have him use a marker to block out all but one math problem.
13. Present material orally and permit oral answers.
14. When he is given an assignment, show him how to arrange his paper in columns, rows, etc.
15. Ask short questions.
16. For the child with an auditory discrimination problem, seat him near the front at a point at which you can face him most of the time while you are speaking. Speak clearly and "mouth" your words. He can read your lips to help him distinguish between similar sounds, i.e., bed from beg, cope from coke, pet from pat, etc.
17. For the child with an auditory memory problem, give directions in small single units. Instead of saying "Take out your spelling book, turn to page 45 and using ink and white paper, copy the words in column one," say "Take out your spelling book--now turn to page 45--now take a sheet of white paper and your pen--find column one (demonstrate)--now copy the words in this column." This rule applies to older perceptually involved students as well as younger ones.
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<tr>
<th>#</th>
<th>Task Description</th>
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<tr>
<td>1</td>
<td>Count</td>
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<td>2</td>
<td>Match group to group</td>
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<td>3</td>
<td>Match: Number to Set</td>
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<td>4</td>
<td>Match: Number to set</td>
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<tr>
<td>5</td>
<td>Match: Number to set</td>
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<td>6</td>
<td>Match group to group</td>
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<tr>
<td>7</td>
<td>Count</td>
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<td>8</td>
<td>Write Numbers: Random</td>
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<td>10</td>
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<td>Addition: Facts</td>
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<td>Addition: Facts</td>
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**Objective:**

Mathematics

**Date:**

Name:

Summary of Probe Rates

C.S.D.C.S., REDLANDS DIAGNOSTIC SERVICE CENTER