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ABSTRACT

This users' manual, intended for use with a Project Head Start teacher training notebook, describes the purpose, development and field testing of the training materials and suggests procedures for using the notebook as a resource in teacher training sessions. The training notebook to which the users' manual refers is based on 11 questions in the areas of problem solving, language development, and self-concept for which preschool teachers indicated a need for answers, and is designed to help preschool teachers develop and use classroom activities based on pertinent research. Teacher training materials as well as preschool curriculum materials for problem-solving activities are appended. (Author/RH)

USERS' MANUAL

FOR

RESEARCH: TRANSLATING HEAD START FINDINGS INTO ACTION

(EXPANDED NOTEBOOK VERSION)

by

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I. Purpose of Notebook*

The Notebook is a resource for you and a guide for training yourself, other individuals, or groups to use research findings for classroom action. The Notebook gives you the research findings, interpretations, and resulting activities related to questions you and others continue to ask as you work with young children and their parents. The Notebook provides you with a knowledge base from research, so that you can see the rationale for doing what you do with young children and their parents. It delineates activities derived from the research, and you may add to the activities and incorporate them into your daily planning and practice in the classroom. The Notebook also is a base for training, and this Users' Manual provides you with models for training.

The Notebook is in a looseleaf format, so that you may write in it and may add new research findings, interpretations, and activities received from the authors or from others who may provide such information. You may want to read on your own to identify research findings, make interpretations, and develop appropriate classroom activities. You may want to ask new questions about working with young children and their parents and look for research findings to answer the questions. You may add to the Notebook in your individual or group training sessions. The procedures used to develop the Notebook are outlined below.

A. Development of Notebook*

1. Survey to Identify Areas of General Information and Questions Related to Child Development

Those who work directly with children and their parents know the information they need and the questions they have about their work. Many sources are available -- textbooks, curriculum guides, consultants, training and education courses, etc. -- and all of these may be used. The present Notebook, however, started with a survey of those who work with young children and their parents as well as supervisors and directors of programs. We asked these people about the questions they needed answered most urgently that had not been answered previously to their satisfaction. We asked them what general information they wanted to help them understand young children's basic development.

From this survey, three areas of general information and eleven questions emerged. The areas of general information include:

a. problem solving abilities

b. language development

c. self-concept

The research findings, interpretations, and classroom activities related to

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*Notebook: Grotberg, E.H., Choper, W., & Peterson, P. Research: Translating Head Start Findings into Action (Updated and expanded notebook version). Washington, D.C.: Office of Human Development Services, Administration for Children, Youth and Families, February 1980.

these three areas of general information are presented in the first section of the Notebook (pages 1 to 19). The eleven questions of concern include:

a. How do I manage the rest of the class when I'm working with an individual child?

b. Does room arrangement impact on classroom behavior? If so, how?

c. What do children learn by playing? How does this happen? What kinds of activities, toys, and equipment enhance this learning process?

d. How do I identify the strengths and weaknesses of individual children? What do I look for to establish a profile of the child?

e. Once I identify these strengths and weaknesses, how do I use this information to plan for the individual child and for the class as a whole?

f. How can I encourage prosocial, cooperative verbal behavior and eliminate some of the negative-aggressive, antisocial behavior?

g. Taking individual differences in ability, temperament, etc. into account, I should expect each child to work and respond at his/her own level, and in accord with his/her own interests. How do I justify having different expectations for different children?

h. How do I help parents accept their children as they are (in terms of interests, temperament, abilities, etc.) rather than as parents feel they should be? How do I help them (parents) stress the positive, accepting reality, rather than looking for the ideal in their children?

i. How can I help and encourage the parents to work with their own children? What types of activities should I suggest? How can I convince them of the importance of positive parent-child interaction?

j. How can I encourage parents to work with me (teamwork) to facilitate the child's development?

k. How do I work with children who have special learning and behavior problems?

The research findings, interpretations, and activities related to the eleven questions comprise the remainder of the Notebook (pages 20 to 139).

2. Search of ERIC for Research Reports

The search for research findings was based on the three areas of general information and the eleven questions. Research findings were collected from several information systems and from special reports of research available to many governmental agencies. The major source of the search, however, was the ERIC Information Network. (ERIC stands for "Educational Resources Information Center.") The network contains all acceptable final reports of research and programmatic activities in the United States. Most of the nation's universities and libraries

contain the ERIC microfiche collection and subscribe to the publications Resources in Education and Current Index to Journals in Education, which update the ERIC collection each month. Many librarians have access to a computer, will search the ERIC data bank, and provide users with microfiche from the collection that is pertinent to their interest. Microfiche are placed into a microfiche reader machine for easy readability in the library. Selected parts of a document may be printed out, or reproduced, if the user desires.

3. Selecting Research Findings, Making Interpretations, and Identifying Appropriate Activities

The final selection of research findings, resulting from the search, depended on how appropriately the findings answered the questions and were targeted on the areas of general information derived from the survey. It soon became clear, however, that research findings seldom could be applied directly to classroom activities. Research is testing questions, determining how people learn, how children develop, etc. The research findings had to be explained in terms of growth and development principles, in terms of how people think, believe, and behave. We called this explaining step "Interpretation."

Then in a continuous pattern from the findings to the interpretation, the activities were selected, but the suggested activities are not exhaustive. You may add more. But you must be sure that the activities you add are consistent with the findings and interpretations -- they limit the activities. You also may combine a number of findings and interpretations for other activities that you develop. In short, you may use the findings and interpretations in a variety of ways and combinations. Your challenge is to be sure that you understand the findings and interpretations that justify the activities you develop. You are invited to go beyond the Notebook in your thinking and to enjoy the creativity of building, combining, and rethinking.

B. Testing of Notebook in Training Sessions

The Notebook was field tested in two training sessions. The first training session was conducted in Washington, D.C., February 4-8, 1980. Approximately 50 trainees attended from 3 to 5 days. The second training session was held in Miami Beach, Florida, at the National Head Start Conference. Approximately 80 trainees attended from 4 to 10 hours.

1. Washington, D.C. Session

The first training session held in Washington, D.C. included staff from Head Start programs in Philadelphia, Pennsylvania; Kent County, Delaware; Orange County, Virginia; Montgomery County, Maryland; and grantees and representatives from public schools in Washington, D.C. The basic training unit from each program included:

Head Start Director

Teachers

Education Specialist or Coordinator

Parent Involvement Specialist or Coordinator

Representative from Grantee Agency

All trainees attended the first 3 days of training. Training sessions included general discussions related to research findings, interpretations, and activities. Work sessions and independent study followed the discussions. Their purpose was to develop the trainees' competence to use the research information by incorporating it into their daily planning activities at their home centers.

On the last 2 days, teachers returned to their centers, and directors and education specialists received further training. Selected journal articles containing research were supplied, from which the participants extracted research findings, interpreted them, and developed classroom activities based on their interpretations. The participants worked in groups and independently on timed workshop exercises. After each workshop exercise, findings, interpretations, and potential classroom activities were shared, discussed, and constructively criticized.

2. Evaluation of Washington, D.C. Session

Participants filled in evaluation sheets daily in which they noted their thoughts, concerns, interests, and evaluation of the training sessions. The evaluation covered five general questions:

a. What are the main things you have learned?

b. How do you feel about the process used for training?

c. What recommendations do you have for improving the process?

d. What follow-up would you like?

e. Additional comments?

All 50 participants responded to the five questions. A summary of the evaluation is presented here to help other groups as they contemplate using the Notebook for training. (Numbers in parentheses indicate how many participants made that comment.)

QUESTION a. — WHAT ARE THE MAIN THINGS YOU HAVE LEARNED?

The evaluative comments suggested that the participants fell into two categories. The first category indicated that the aims and objectives of the process were operable. The level of this group's professional growth, however, suggested that the material served as a review; reinforcing their training. The second category of participants indicated that the presentation of concepts for problem solving and the "model for learning" had been successful.

QUESTION b. — HOW DO YOU FEEL ABOUT THIS PROCESS USED FOR TRAINING?

Participant responses to the process showed that their greatest concern was that the sessions involved too much listening (15). The sessions should place less emphasis on rigid adherence to reading materials (10). The method is beneficial (6) and reinforcing (7). The sessions should include the geographical areas for all Head Start programs (3) with parent inclusion (2) and more staff level personnel (3). Additionally, more time should be allowed for small-group participation (2) and presentation of opposing research (3). The process is useful, important, and excellent for paraprofessionals (5).

QUESTION c. – WHAT RECOMMENDATIONS DO YOU HAVE FOR IMPROVING THE PROCESS?

Recommendations for improving the process were many and varied. The largest concentration of opinions indicated a greater need for time to work on each step of the process and to interpret literature as a group (10). The participants should have prior opportunity to read research (12) and to interpret additional research (10). The team should be split up to emphasize cross-grouping for sharing ideas (5). Sharing ideas from different Head Start programs should be emphasized (5). The process is excellent for getting research into the classroom (12). Throughout the entire process, discussions should include child development (4), exceptional children (3), and provisions for intervention (6) and literature for younger children (6). The overall process improvement might consider integrating groups in the beginning of the session (3). They should be grouped by state (1) and ideas compiled and submitted by participants (4). Questions should not be delayed until designated times (2). This would allow greater facilitation for dialogue (2). The process is excellent for centers with office staff to train (2). The material should be presented on a higher level (8), and individuals should be instructed on how to do research (3).

QUESTION d. – WHAT FOLLOW-UP WOULD YOU LIKE?

The follow-up procedures should make available continuous findings for documented materials (20). There should be future sessions with teams to discuss the relevance of the process, modifications (11), and generally to compare notes after implementation (5). The training people of each Head Start center should be used to assist future training sessions (7) with mini-workshops at each group site (3). The participants should be provided a compilation of ideas and information for classroom implementation (5). A profile sheet should be developed to monitor student progress (3). There is a need for more problem solving techniques for younger children (6). Information, additionally, should include information for bilingual programs and techniques (6).

QUESTION e. – ADDITIONAL COMMENTS?

The program comments indicate a thoughtful (6), well-planned (5) process that is helpful (2) and a good means for sharing information (3). The process should broaden its scope to all Head Start programs (4), and comparisons should be made. The diversity of participants was excellent (2). However, the material appeared too basic for those with college degrees (8). The process is based on an excellent publication (2). It should include more reports on children from different socioeconomic groups (3). Research should be ongoing with refined documentation (6).

Each participant received a certificate from the training session that complied with performance standard requirements related to staff training.

The follow-up sessions with the first training group was held in Montgomery County, April 9, 1980. The substance of that follow-up session is incorporated in the next section, Procedures for Using the Notebook as a Resource in Training – Ideas for Involving Others.

3. Miami Beach, Florida Session

Eighty Head Start representatives attended the second training session at the National Head Start Conference in Miami Beach, Florida, May 22-23, 1980. Trainees attended sessions a minimum of 4 hours and a maximum of 10 hours. Attendees were parents, teachers, directors, regional training office personnel, and representatives from grantee and delegate agencies. Because of time constraints, the format was restructured. Participants were assigned to groups and worked on questions, interpretations, and development of activities in a round-robin fashion for three of the four sessions, and were free to select the question they wished to work on for the fourth session. The procedures followed were a modification of the 5-day intensive training session held in Washington, D.C.

Participants indicated that they planned to use the Notebook and training experiences at their home centers. Some raised the question of how to get their State and local center staff trained in utilizing research findings. Others requested and received additional copies of the training manual (Notebook) in order to incorporate training in some in-service training offices.

Participants received certification of participation in the training session according to the number of hours they attended.

II. Procedures for Using Notebook as a Recourse in Training

A. Individual or Group Procedures

The Notebook may be used by an individual or by a group. In either case, it is important to understand how the Notebook was developed and organized.

1. Understanding the Rationale and Organization of Notebook

Reread the Purpose Section of this Users' Manual. In order to use the Notebook for individual or group purposes, it is necessary to grasp the major points employed to develop the Notebook.

a. A survey was conducted to determine the questions asked most frequently by staff working with young children across the country, and to determine the basic areas of general information important to the staff.
b. Searches were conducted of the research literature, particularly using ERIC, to identify the important research findings relating to the questions and general information areas of concern.
c. The research findings were interpreted and were explained in developmental and behavioral terms.
d. Activities were suggested that were consistent with the research findings and interpretations.

IMPORTANT: The activities must be in line with the findings and the interpretations; they must not go beyond either, so that when an individual or group adds activities, there must be a clear research base for the additional activities. The purpose of the format, in summary, is to help staff understand the basis for activities and the justification for expanding on the activities. The goal is to encourage creative expansion from an anchor of facts.

2. Training Model for Groups

The following description of a group training model is based on the field tested sessions described above. The model is presented in a series of actions:

a. Selection of staff

The basic training unit should consist of one director of a Head Start center, one education coordinator/consultant, and classroom staff of the same center/program who work directly with children. Classroom staff should:

(1) be trained in child development, CDA, or have comparable training in early childhood education;
(2) have at least 1 year's experience as a staff member in Head Start;
(3) demonstrate willingness to incorporate new ideas and behaviors into daily functioning in the classroom;
(4) show interest in keeping up-to-date on the latest knowledge about child development and learning; and
(5) be willing to share knowledge and ideas with other staff members.

b. Survey of staff needs

Before the training session is held, a list of the eleven questions should be sent to the trainees asking them to check the questions most important to them and to add new questions as they wish. The questions supplied are the ones most frequently asked by Head Start staff as determined in a survey conducted by phone and in person. Research findings are selected to address those questions and any new question. The basic questions appear above on page 2.

c. Training sessions format

(1) Basic training unit(s)

The basic training unit(s) may meet for up to 3 days using this sequence of activities:

(a) Select one question from the eleven questions asked, and select a question of special interest that was identified by the survey of staff needs.
(b) Turn to the pages in the Notebook addressing the selected question and discuss the research findings related to that question.
(c) After the findings have been discussed, discuss the interpretations of the findings. Note that the interpretations are presented in terms of child development and learning.
(d) After the findings and interpretations have been discussed, discuss the activities that emerge. Note that the activities must be consistent with the findings and interpretations and must not go beyond them.
(e) The participants may add activities to the ones suggested in the Notebook. They may be written in the Notebook's margins or on separate sheets of paper.
(f) The participants may meet in small groups to develop suggestions for using the activities in daily classroom plans. They may write up lesson plans incorporating the activities and help each other with criticisms.
(g) The participants may reassemble in a large group to share their lesson plans and to help each other with criticisms.
(h) Steps (a) through (g) may be repeated using a different question.

(2) Special training unit

Two additional days should be spent with directors/education coordinators/consultants in order to help them (1) to identify research findings from papers and journal articles, (2) to interpret the research findings, and (3) to determine potential classroom activities appropriate to the findings and interpretations. The procedure to be used is in reverse order to facilitate acquisition of skills.

Day One

Step 1

- Divide participants into small working groups (program/center teams).
- Give each individual a worksheet with research findings and interpretations only. (A replica of a Notebook page, with activities deleted, is an example of such a worksheet. It may be found in Appendix A.) Ask participants to develop activities based on the findings and interpretations.
- Conduct a large group feedback session to compare:
  first – activities developed independently, and
  second – activities suggested in the Notebook.
- Initiate group discussion and feedback related to activities developed. Are they comparable? . . . better than? Do they miss the mark? Why?

Step 2

- Direct participants to work independently to develop activities applicable to another set of findings and interpretations.
- Repeat the remaining sequence of activities in Step 1.

Step 3

- Ask participants to work in small teams, in order to interpret findings and to develop activities.
- Give each individual a worksheet with research findings only. Ask them to interpret the findings and to develop activities. (In Appendix B you will find an actual page from the Notebook with the interpretations and activities deleted.)
- Repeat the remaining sequence of activities in Step 1.

Step 4

- Direct participants to work independently to interpret findings and to develop activities.
- Repeat the remaining sequence of activities in Step 1.

Step 5

- Give participants a research article. Allow approximately 1 hour for them:

  to read the entire article
  to tease out critical findings
  to interpret findings
  to develop activities.

- Initiate a large group feedback and discussion session.

NOTE: During discussion of research articles, encourage participants to begin to look for key words that designate or indicate findings; e.g., "reports that," "concluded that," "therefore." Suggest that they note numbers, statistics, and quantitative findings. It is useful to have a researcher participate in the sessions to assure an accurate selection of findings and interpretations.

Step 6

- Home Assignment. Give each participant a research article to take home to read and underscore findings in order to be prepared to work the next day on interpreting findings and developing appropriate activities.

Day Two

Step 7

- Discuss in a group the findings underscored in the research article that was assigned for home study.
- Instruct participants to work independently to interpret findings agreed upon and to develop appropriate activities.
- Lead group discussion and feedback session.

Step 8

- Repeat Steps 5, 6, and/or 7, if appropriate or deemed necessary.

Step 9

- Initiate group discussion/interaction related to follow-up activities. (This may be a team or individual exercise.) Formulate questions similar to:
  - What plans have you written that you will use in your Head Start programs?
  - What will you do when you return to your sites, and how will you implement the knowledge gained through this training session?

Step 10

- Conduct an evaluation of the training session. Use the same questions that appear on pages 4 and 5.

Step 11

- Follow-up. Classroom staff are to have access to the education coordinator/consultant for questions about the training sessions and the materials. The education coordinator/consultant will have access to ongoing research findings, interpretations, and activities as they develop.

B. Ideas for Involving Others

So many training or workshop efforts stop when the training session or workshop ends. An individual may use the experience for his or her own actions as a staff member. The group that was trained together may continue discussions on some follow-up basis. But these things should not be left to chance — even when an individual or group is self-taught. The critical thing is to begin thinking about the future use of training, workshop, or self-taught information, so that it becomes a part of daily planning and behavior. It is

helpful to discuss and/or write down some ways to incorporate the information into follow-up behavior. The leaders of the pilot workshop held in February and described above asked the group these questions:

What will you be doing when you return to your sites? How will you implement the knowledge gained during this past week?

Here are some of the responses:

"Present training to administrative staff."

"Meet with teachers who were present earlier in the week."

"Team will present results of week's activities to teaching staff."

"Work in centers with center personnel."

"Use the team present to continue to train additional personnel."

"Teaching others and reinforcing team who participated in training."

"Use ripple effect for training others."

"Use center level teams as ongoing monitors."

"Develop, with modifications, training models using all participants as trainers."

"Invite policy makers to attend training sessions."

"Involve as many parents in training as possible."

"Share with teaching team present first 3 days -- results of last 2 days."

"Maintain team concept and spread training beyond confines of program team."

"Assign team members specific tasks to be reported at designated meetings."

"Discuss teacher and staff exchange across program lines."

"Ongoing staff development sessions regarding training received:"

"Use of training manual as a guide."

"Add classroom aides to training team."

"Train other heads of components/services and use them as trainers."

"Use Program Newsletter as a medium for spreading the word."

"We have scheduled a staff meeting when we return. At that time we will present our findings to them. Then we will present a report to the teaching staff. We will select one area or one topic and work with individual teachers. Then we will check back with the original team."

"The teaching teams here will become teams in each center. They will meet on a weekly basis, and will develop a training plan based on what we have learned here. All of our people will become leaders."

"The members of our team here will be trainers for their individual centers. They will administer the whole package. They will have 1 hour a day to work out the implementation of the program. We will invite the Board of Directors to sessions and report on this meeting. Parent coordinators will be involved also. Head Start teachers attending the workshop will keep records of how the training and the new system of teaching is working. It will be reported at the meeting in April."

"We will involve parents. We haven't taken time to make specific plans; however, we will meet with our teaching staff and let them know what happened here. I think they are our peers, and they will be working directly in our program on this package of materials."

"Problem solving will be our focus. Information will be fed to individual centers. We plan to do an ERIC search on problem solving and obtain information from Howard University's and Catholic University's libraries. On 2/20/80, we will have an all-day session to develop a whole plan to move in the area of problem solving. At that meeting, the materials received here will be disseminated."

"All of our teachers were here. They have taken the Notebook back for their teacher aides. We want to set up programs for children with special needs. Staff development continuity will replace merely brainstorming."

"We will share information received here with our staff. We will give training sessions for preschool teachers in the District's regions."

"I plan to pass this information along in Region V. We expect to divide teachers into teams. Staff development will be focused primarily on problem solving."

"I plan to develop a team. I do a newsletter and will report this meeting in it. Will include portions of research findings. Our projects are research based. Building principals in 20 centers are located in elementary schools. I will encourage the staff to send me articles from which I will pull out and print research findings."

C. Ideas for Building on Notebook by Follow-up Activities

A follow-up meeting was held in April in which the February workshop participants reported on what they actually did accomplish. They were not too far off from the initial expressions of intent. What they accomplished provides good ideas for involving others after training, and for building on the Notebook. Excerpts from the follow-up meeting are provided so that you can get the flavor as well as the content of the building on the Notebook.

Reports from Head Start centers:*

Ralph: Yesterday our teachers met to discuss problem solving. (A copy of the curriculum they developed on Problem Solving may be found in Appendix C.) Each teacher shared how she thinks she provides for a child's problem solving on a day-to-day basis. We explored situations that provided opportunities for using problem solving techniques. Teachers told when they would intervene when a child is solving problems and when the child should be left alone. We discussed activities, games, and other situations that provide a child with individual chances to solve problems. Teachers had incorporated problem solving in planning but were unaware of what social skills they also could develop. They were asked to begin to plan activities and to look at their attitudes toward solving problems and how their attitudes could affect the children. Then we discussed research findings and interpretations from the Notebook. We looked at the teachers' relationships with the children and their understanding of the child's need for empathy during problem solving. The child often is not given enough time to play and explore. We talked about what to look for when they absorb the child in an attempt to enhance his problem solving skills . . . and how to help the child succeed.

Ann: Are these Head Start teachers or a subgroup of them?

Barbara: The people who had the original training remained a nucleus of trainers. They included staff from three of our centers. Staff from one center didn't attend the DC Workshop, but we are training them now. We schedule meetings on a weekly basis to talk about each area before we present it to the staff . . . and we brainstorm. I've gathered more activities and materials. We started with self-concept as it relates to the teacher. It was very exciting because the staff had a chance to be supportive of each other. The meetings were very successful. We moved on to language and took problem solving last. In every center there's a training group: the two people who came to the DC Workshop and our center directors who didn't come to training. I find that the centers are operating at different levels. Some centers weren't quite ready for teacher self-concept. We also did a needs assessment using the Notebook criteria and discovered that our area of need was greatest in the home center. Our next cycle will be based on that. Rather than going through the Notebook as it's set up, we followed the model of taking the greatest area of need — working with that — and then moving on to an area of lesser need.

Sue: When you focused on teachers' self-concepts, did you have a set of questions?

Barbara: A center director found self-concept questionnaires. I had articles on teacher burnout. The questionnaires were based on individual centers. I didn't prepare them. I left that up to directors who know their personnel better than I do.

*Participants' names have been changed.

Ralph: The questionnaires asked two important questions: What outstanding traits do you possess? What contributions do you make to your job? Teachers listed their answers, which were discussed by peers. Meetings became very sensitive but were well accepted. Teachers rated themselves on a scale of 1 to 5, and sometimes were very modest. Their peers had a chance to encourage them and tell them they were better than their self-ratings.

Barbara: I think it made everybody accept what we are bringing to them too. It got them involved in feeling good. I was kind of overwhelmed by the response.

Ann: One of the things you all commented on during the Training Workshop was how you learned to know and to appreciate each other more. Apparently you're trying to stimulate that very phenomenon in your home territory where your staff can develop a feeling and a sensitivity for each other.

Ralph: In each area we explore, we focus first on staff and then on staff-child relations. We examine where we are in relation to our language, modeling, self-concept, and problem solving techniques.

Barbara: The thing I found during this project is that different things make different centers go — compounded by some programmatic problems. Things were great in one center . . . not so great in another. We'll work harder on those centers.

Joan: Our center's main problem is children with behavioral problems. We've placed them in a smaller room — in less space. They become much calmer and less aggressive. We talk louder so they can hear when they're noisy and then lower our voices to get their attention. We have a time-out for "Free To Be Me." This develops language skills. They share what they did the night before, what TV they saw. We send parents notes telling them what we're doing and ask their help with an activity, which we explain on paper,

Ann: You indicated that you made a presentation to a board. What board?

Susan: Head Start Board of Directors — our governing body made up of community professionals. There are 10 directors. It's a corporation. It's not a community action agency. The Board receives funds for our two centers with 78 children.

Ann: Like a Board of Education?

Susan: Yes, but on a smaller scale. Joan was challenged by the mental health consultant about using a smaller space for the children. He felt they needed a lot of room. When she discussed it with him and backed it up with research, he agreed to do it her way.

Joan: The children are less aggressive. Their attention span is much better.

Ann: Tell us about your presentation.

Joan: We had to write a summary of what happened at the Training Workshop, what we did, if we enjoyed ourselves, and what we had learned.

Ann: The Board understood what you were saying? Had no trouble with it?

Susan: They understood . . . didn't have any problems. They were pleased. Two parents will be at the Head Start Conference and will attend training.

Martha: We had a training session when we returned and used the Notebook to present what we'd learned in DC. Each of four teachers took a section and selected and commented on one area over 2 days. We have evaluation for all our sessions. In evaluation, the teachers thought the book was very helpful, but they preferred using smaller groups for better interaction. We set this up on a center basis dividing into four groups meeting three times on a weekly basis. One center focused on classroom arrangement because a teacher wanted to make some changes. An aide didn't go along with the changes. During a meeting, two teachers and two aides discussed the matter . . . how classrooms could be arranged. They ended up rearranging the classroom in dispute. The reluctant aide became involved and listened to the teacher who could cite the rationale for the changes. If it hadn't been for the Notebook and research findings, it might not have gone as well. The centers continue to have meetings — focusing on problem solving. I asked teachers who had had the DC training to write some things they'd done in their classrooms. They responded:

"I listen to parents' ideas and encourage them to use their ideas in the classroom."

"I compliment mothers for doing fine work with the children."

Martha: We try to get all parents to volunteer once a week. It's not easy to get them involved. Here, teachers focused on parents doing something so they'd feel a part of the center.

"One mother wanted to teach the children safety. She took materials home and made street lights. Then, she explained and demonstrated for the children. Another mother prepared and demonstrated how to make Bunnies for the Spring bulletin board."

"I've asked mothers either to do the calendar, discuss a topic, sit and participate, or read a story during 'Circle Time.' I placed signs over various activity centers — there are hints over the sandbox to help children learn to play in sand."

"I asked mothers to take children to the mother's favorite playground, and I listened to parents' suggestions for other field trips."

"I complimented parents on wonderful singing voices when they led the children in song. I used visual reinforcement and encouragement. An aide suggested she'd enjoy working with parents on a future workshop. I'll call on her."

"A mother made a poster of a child with hat, scarf, and mittens attached. It's posted by the door, and the poster reads: 'Thanks, Mommy, for remembering.'"

"I've been specific in my conversation with the children — having them explain why they do things in a certain way. I demonstrated as a model for the parents and avoided saying anything negative about the children's behavior."

Martha: That's a sample of what's happening at our centers.

Ann: Your interest has been to get parents involved, reinforcing their involvement and their self-concepts in terms of their ability to work with children rather than expecting them to come in and "wipe up." We professionals tend to do that — and that's putting parents down. Head Start has a study on that kind of thing.

Pam: Teachers have found they're able to work with parents. Some parents are reluctant and have a tendency to pull back. One teacher with a reluctant parent is encouraging her to stay and cut something out if she doesn't want to work with children. One day, all the children were gathered around the parent watching her. Eventually she'll be comfortable.

Ann: Another good technique is to explain to parents what you're doing with the children . . . why you're doing it . . . and the purpose of the activity. They begin to get an idea of child development. They are able also to observe their children among other children.

Tanda: We started off similar to the first group reporting, using self-concept. Because of in-house problems, we brainstormed on what were the teachers' and aides' roles and responsibilities. We separated teachers and aides into groups which discussed and made lists of what they thought were their roles and responsibilities. Their lists were alike — they were on the same wavelength. At a meeting 2 weeks later, we discussed the conference findings. We had xeroxed the Notebook problem solving sec-

tion. We divided 16 teachers and 16 aides (from 10 schools) into groups so that no teacher or her assistant were together and no group was composed of all aides. They had a chance to get to know one another. We issued a brief summary of what had taken place in DC. Each group looked at five research findings and came up with additional activities or actions. A recorder from each group reported back to the large group. A lot of aides were not aware they were using problem solving techniques in the classroom. Teachers had wanted aides to challenge children instead of solving their problems for them. It was decided to have summer workshops.

The use of both expanded activities, as developed through involvement of others at the program center, and adapting the Notebook to local needs and interests is well illustrated in these comments from the follow-up meeting.

III. Conclusion

The Notebook may be used by individuals or groups in self-training or in group training. The intent is to make research findings understandable in terms of their interpretation and utilization in classroom activities. The more familiar you become with the application of research findings, the more creative you can be in planning your activities for children and their parents. You can see what participants in one training session did after the training.

If you want more information; if you want copies of the Notebook or this Users' Manual; or if you want updated research findings, interpretations, and activities, write to:

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(7a) TAKING INDIVIDUAL DIFFERENCES IN ABILITY, TEMPERAMENT, ETC. INTO ACCOUNT, I SHOULD EXPECT EACH CHILD TO WORK AND RESPOND AT HIS/HER OWN LEVEL, AND IN ACCORD WITH HIS/HER OWN INTERESTS. HOW DO I JUSTIFY HAVING DIFFERENT EXPECTATIONS FOR DIFFERENT CHILDREN?

Findings	Interpretations	Activities
3. Children develop at different rates, according to individual patterns, and continuously.	3. Different children are at different points developmentally, and it is appropriate and necessary to meet child at his/her own level.	
4. When a child is labelled as different, people hold expectations of that child dependent on the specific label assigned.	4. Children assume that the label given them is correct and act accordingly. When certain types of behavior are expected from children, those types of behavior are often observed, and those behaviors, which are not specifically looked for, are ignored.	

(9) HOW CAN I HELP AND ENCOURAGE THE PARENTS TO WORK WITH THEIR OWN CHILDREN? WHAT TYPES OF ACTIVITIES SHOULD I SUGGEST? HOW CAN I CONVINCE THEM OF THE IMPORTANCE OF POSITIVE PARENT-CHILD INTERACTION?

Findings	Interpretations	Activities
1. Parents who receive some training in working with their children benefit both themselves and their children. Seeing the benefits encourages parents to continue to work with their children.		

APPENDIX C

PROBLEM SOLVING SKILLS IN HEAD START

Montgomery County Head Start

March 1980

Research Utilization Effort Committee

Charles I. Wiles, Jr., Director
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Blanche Seymour
Sadie White

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PROBLEM SOLVING SKILLS IN HEAD START

Introduction

One of the focuses of Head Start is problem solving, a skill that is needed throughout life. This paper utilizes research related to problem solving and suggests some activities enhancing these skills for young children at home and at school. We want to help children create and figure out why rather than merely supply them with information.

Problem solving is a process involving looking at all aspects of a situation – analyzing and synthesizing in order to find one or many possible solutions to a problem. A problem springs from a situation that contains a combination of both familiar and unfamiliar elements. Problem solving skills develop from the simple to the complex.

The adult's role in problem solving is to introduce new problem solving situations to the child throughout the year to stimulate exploration. Initially, the adult's role is to listen and to observe carefully in order to focus on and respond to the child's problems. The attitude of the teacher/adult should be to treasure the child's thinking process as just as important as finding the right answer. Opportunities should be present for language development. Introduce concepts as they fit into the context of the child's activities – same-different, more-less, on top of, etc. Allow children time to think, explore, discover, and digest information before responding.

Adults should encourage children:

- to talk about their work; adult comments should be nonjudgmental
- to talk about their feelings
- to see another child's point of view
- to see effects of their actions

Use open-ended questions to encourage children to think about possible solutions:

What would happen if you . . .?
How many ways do you think you could . . . (get across the room, etc.)?
Can you think of another way to . . .?
Did you ever try to . . .?
Can you tell me why . . . (these are all in one pile, etc.)?
I don't remember where we put . . . . Who do you think might know?
Can you find one like this one?
How do you think you could find out?
Can you figure out a way . . . (to get your bikes apart, etc.)?
Why do you think . . . (the magnet won't pick that up, etc.)?
Let's watch and see what . . . (the worm does when we put him down, etc.).

In order to learn to be a problem solver, the child must be responsive to sensory stimulation from the environment. He must be permitted to explore, manipulate, and interact with his physical and social environment through his senses. The child must develop a language to classify and categorize his experiences for himself as well as to communicate them to others.

The child must learn to discriminate, associate, analyze, and combine parts and wholes of objects and situations. Given many instances of the same or similar objects or situations, the child will learn to make associations, relationships, and generalizations. He will become aware of consequences and develop causal thinking. In addition, the child must learn to develop a number of alternative methods in approaching a problem situation and try each until he finds one or more acceptable solutions.

A child's problem solving skills may differ in different areas. A child may not be able to solve a table toy problem (involving language, fine motor, visual perception, etc.) but may succeed creatively in a gross motor problem that requires less language and motor control.

Children's readiness to deal with the various levels and aspects of problem solving is related to their developmental level. Children should experience success and not be overwhelmed with problem solving tasks beyond their developmental level, since this leads to frustration and reluctance to risk errors in the future.

PROBLEM SOLVING THROUGH COOKING

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
I. Provide the child with an opportunity to develop and understand problem solving activities. A. Sequential order: Follow recipe cards or a picture chart (following directions). B. Explore and identify: Name colors and shapes, recognize letters, identify picture on box, use senses (see, smell, touch, taste). C. Observe and change: Powder to liquid, liquid to solid, hot to cold (feel textures).	Same as classroom activities. See directions for making jello.	Children's development in the area of cooperative problem solving can be achieved through the use of diversified life experiences. (1)* Individual problem solving involves opportunities for perceptual, cognitive, and language experiences and enhances self-concept. (2)
II. Provide the child with an opportunity to develop measuring skills. A. Pour liquids, measure dry materials, use balance scale. B. Concepts of amount: big-little, a lot-a few, more-less, etc.		
III. Provide the child with an opportunity to recognize and develop number concepts and shapes. A. Use helping hands for lunch time. Count portions of food, number of children, number of chairs. B. Identify shapes in food and equipment used.	Count number of people and set table. Count portions of food for each and quantities of food for meal preparation. Recognize and cut shapes when eating. Some things change shape when they cook. Talk about shapes of table, bowls, plates, and how napkins are folded, etc.	
IV. Provide the child with an opportunity to understand science concepts. Boil, simmer, heat, chill, freeze. See liquids change to solids.	Same as classroom activities.	

*Numbers in parentheses refer to citations in the Bibliography.

JELLO MAKING TASK

A. A detailed example of applying problem solving in the classroom and in the home for 3- and 4-year olds.

Ingredients

One large box of jello, or two small boxes
Hot and cold water, or ice cubes
Fruit or marshmallows, if desired

Equipment needed

Recipe picture chart or cards
Measuring cups
Bowls--Spoons--Egg beater, if used
Large jello mold or individual molds

Classroom large group circle time

- Look at picture on box to identify flavor (recognition of fruit on box).
- Recognition of letters (J E L L O).
- Identify shape of box.
- Count boxes, name size of boxes: one large, two small; same-different; two small boxes equal or are the same as one large box.
- Note color, texture, odor.
- Review sequential steps for making jello by using one large picture recipe chart (see next page).
- Divide the class into two groups with an adult in each, or take one small group at a time with one adult.
- Use individual sequential picture cards in which each child follows directions and makes his/her own portion. The child will learn the numbered sequence, will use counting skills, and will learn left-to-right concepts.
- These directions also may be used at home.

B. Plant and care for seeds.

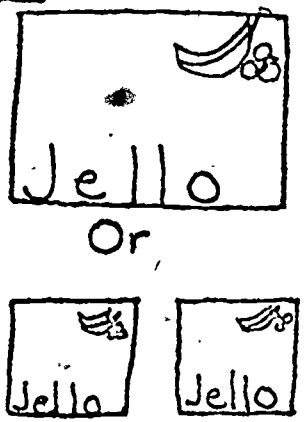
Plant a home garden.

PICTURE RECIPE CHART

Jello

Jello - 1 box
hot water
cold water
marshmallows
stir together
refrigerate

1



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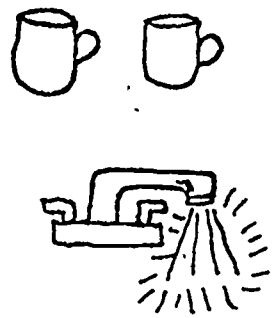

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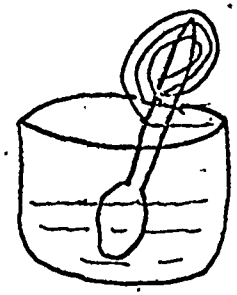

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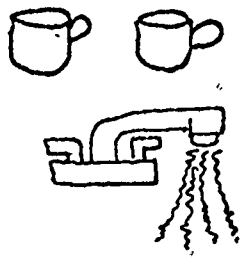

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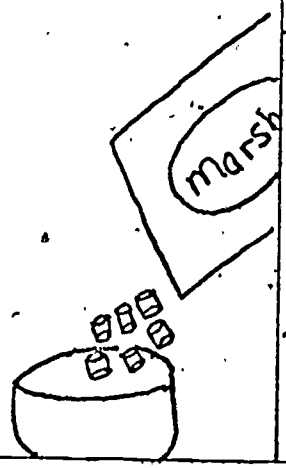

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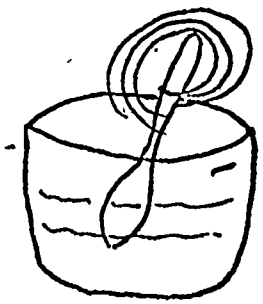

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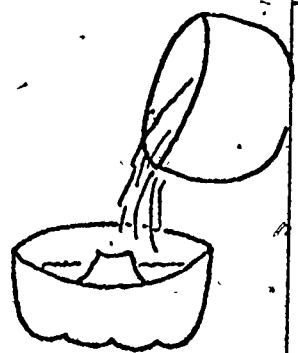

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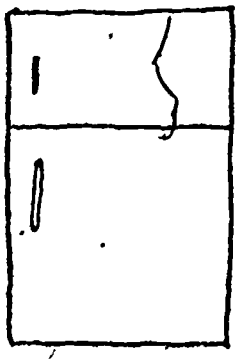


PROBLEM SOLVING THROUGH BLOCKS, SAND AND WATER PLAY, AND WOODWORKING

CLASSROOM ACTIVITIES

I. Blocks

A. Call attention to sizes and likenesses and differences in blocks as well as names of the shapes.

B. Encourage use of substitutions (e.g., two double units take the place of a quadruple unit).

C. Call attention to the structure and arrangement of the child's construction. When a child runs into a problem of balance (e.g., trying to get an upright to stand) utilize hints "What could you use to help hold it?" rather than solving the problem for the child.

D. Talk with child about cause and effect in construction "What do you think would happen if you put a block on this side?" An adult-made sketch or Polaroid picture of a block construction may give one kind of permanency to the children's creation and may help children to see the construction from another perspective.

II. Unit Block Parquetry

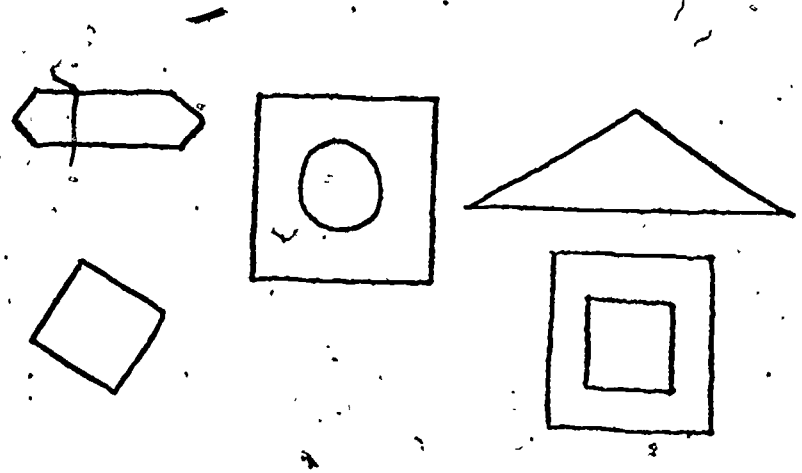
On a tag board, draw configurations made by joining two or more blocks. Child places unit blocks on outline.

HOME ACTIVITIES

Save empty boxes of various sizes and shapes for children to use in construction and dramatic play.

RATIONALE

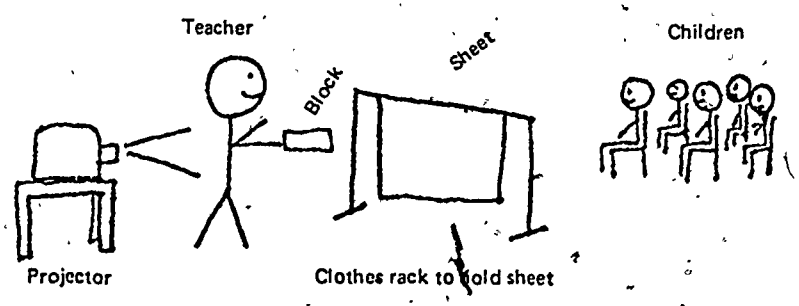
Sensory manipulation of materials leads to cognitive development of children. (3a), (3b), and (3c)



CLASSROOM ACTIVITIES

III. Shadow Blocks

Set up slide or filmstrip projector behind sheet. Hold block between sheet and projector so that its shadow falls on sheet. Change block's position so that all dimensions are shown. Children (seated so they can see only the shadow, not the blocks) are instructed to find a block on the shelves that matches the one behind the sheet.



IV. Sand and Water Play

Children need time to assimilate the properties of sand and water by experimenting in their own way before they will be ready to engage in adult-structured experiments and activities.

A. Balance Scales

1. Set out about 10 one-inch cubes and balance scales. Let child experiment. Lead child by questions: "How could you get this side to go up? . . . this side to go down? . . . both sides to balance? . . . remain on the same level?" "Which side is heavier? . . . lighter?"
2. Provide sand in place of the cubes to be used as above. Try using a cup of wet sand on one side and a cup of dry sand on the other.
3. Provide water and measuring cups to be used as above.

HOME ACTIVITIES

Let parents know that playing in sand and water are valuable experiences for children. Encourage parents to have children wash dishes and doll clothes and dig whenever it may be allowed (vacant lot, corner of yard where no grass will grow, etc.). Sometimes children could be allowed to play in a puddle or make mud pies.

RATIONALE

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
B. Floating and Sinking Provide a container labeled "float," another labeled "sink," and an assortment of objects for children to try out and place in the appropriate container. Encourage child to hypothesize before he/she puts the object in water: "Do you think this will float or sink?" Give child an aluminum tray (TV dinner) with holes punched in bottom. Ask: "Do you think this holey boat will float or sink?" Elicit reasons. Let child try it out.		Sensory manipulation of materials leads to cognitive development of children. (3a), (3b), and (3c)
C. Absorption "Do you think you will be able to see a drop of water or just a wet spot when you squeeze a drop from this medicine dropper onto this paper towel . . . aluminum foil . . . wood . . . waxed paper . . . terry fabric . . . nylon fabric?"		
D. Evaporation "Which wet fabric will dry more quickly on the radiator (or in the sun)?" Wool, cotton, nylon, etc. Try it.		
E. Solubility "Do you think this sand (salt, flour, dirt, starch, etc.) will dissolve in water?". Let child do the actual pouring, spooning, stirring, etc. Of course, the child will first need to learn the meaning of "dissolve."		
V. Woodworking In working with this medium the child will be forced to solve a number of problems: how to hold the wood so that he/she can hammer, saw, or drill it; how to keep nails from becoming bent, how to attach a spool, etc. In order to make even a simple airplane, e.g., the child will have to make comparisons related to length, width, thickness. (The wings need to be shorter than the body of the airplane, and the thinner piece of wood must be nailed on to the thicker piece.) Because woodworking is so highly motivating, children often are persistent enough to solve their problems with the teacher asking questions that help clarify for the child what he/she wants to do.	Involve child as a co-helper with parents as they perform do-it-yourself activities around the home.	Same as above.

PROBLEM SOLVING THROUGH TABLE ACTIVITIES

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
Table Activities I. Give a small group of children a pan, balance scale, and container of assorted small objects, preferrably the same shape. Small rectangular objects might be dominoes, guest bars of soap, switch plates, Lego, boxes of paper clips taped shut, playing cards, etc. Ask children: • to name the objects; talk about same and different. • to name what the objects are made of – wood, plastic, paper, metal, etc. • to hold one object in each hand. Weigh and tell if they think it is the same weight or different; heavier or lighter; larger or smaller; smoother or rougher. II. Help children to use words to describe and compare (taller, shorter) attributes of the items. • to place two objects on the scale, one in each pan. Encourage the child to tell which is heavier. • to weigh a can of soup in their hands and use words to compare it to the objects they have been handling. "Do you think we have just one thing we could balance it with?" Encourage discussion of possibilities.	Parents can collect an assortment of different sized plastic bottles and tops to match. Have one less top than bottle. Ask child, "Can you find all the tops to the bottles and put them on the right one?" "What do you suppose was in the bottle?" "Have you smelled this before (empty bottle)?" "Where?" "Can you put the small bottles in another place and the large bottles in another place?" Watch your child match all the tops and bottles. See if he/she notices one top is extra/missing. If not, ask, "What happened?" "What do you need?" "What should we do?" Encourage child to discuss problem.	A knowledge of descriptive, comparative, and relational terms facilitates problem solving in children. (4) Children are more successful in solving problems when important features of the tasks are highlighted. (5)

PROBLEM SOLVING THROUGH MUSIC

Music Activities I. The teacher encourages the child: • to describe • to compare • possibly to draw conclusions For example: "Can we sing this in another way?" "Is this song as fast as the other ones?" "How are they different?"	Suggest movements such as walking, running, hopping, jumping, clapping, stamping. Ask questions that lead to problem solving; e.g., • "Can you find another part of your body to do that with?" • "Can you do that sitting down? . . . standing? . . . lower? . . . higher?"	Training children to generate alternative solutions to a problem contributes to their problem solving skills. (4)

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
II. The teacher provides space for movement exploration; for example: • Balloon dance • Batman in the Kitchen (song) • Scarf dances	Encourage child to imitate movements seen in nature; for example: • wind blowing • clouds moving • snowflakes falling Parents of different ethnic backgrounds share cultural dances in the classroom, read poems, nursery rhymes, and stories.	
III. The teacher obtains music series books for the primary level or other song collections and periodically teaches music that relates to seasonal changes, tone matching, animal movements, and cultural activities.		
IV. Use auto harp to teach tempo.	Experiment with sound producing objects; for example: toy drums, whistles, pots and pans, egg beater, corn popper, etc.	
V. Identify and categorize musical instruments.	Listen to recordings and tapes.	
VI. Relate and group sounds as high, low, soft, loud.	Encourage children to create their own songs. Discover children's concerts and attend. Encourage family to sing, dance, and play together.	
VII. The teacher provides opportunities for verbal and nonverbal expression; for example: use recording to express feelings (Hap Palmer).	Imitate animal movement. How does it feel to move like a snake? . . . a rabbit? . . . a cat? Ask questions to express feelings: "How do you feel when we sing together? . . . dance together? . . . play together?"	Training children to use words designating feeling and to understand that feelings change, and people may choose and feel differently from each other contributes to their problem solving skills. (4)

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
VIII. Experiment with the human voice: • whistle • hum • sing • yell • whisper } "How does it feel?"		
IX. The teacher can "catch" a chant, song, dance and repeat the rhythm for the child on an individual basis.		

PROBLEM SOLVING THROUGH DRAMATIC PLAY

Dramatic Activities		
I. Carefully observe and listen to children in order to determine when and how to interact or intervene to extend play.	Parents can provide dress-up clothing (boys and girls) in a box and interact with the children.	Acquisition and performance of socio-dramatic play improves problem solving behavior of children. (6a), (6b), (6c)
II. Teacher takes part in dramatic play of the children by enacting a dramatic role that fits into the ongoing theme of the children's play (e.g., being a grandmother who takes children to the store).	Let children use large boxes (packing) as a playhouse, cave, etc. "What else could your box be?"	
III. Teacher/adult gives suggestions, questions, and clarifies the role of the person the child is depicting. "Doctor, what can you do to fix my broken arm?"	Parents tell child to pretend he is going to visit a relative. He will have to put all the things he needs in a suitcase. "What will he need?"	
IV. The teacher/adult produces available props that are models of familiar elements in the child's environment.	Parents can make interesting associations and suggestions to children as opportunities arise; e.g., "I wonder what this oatmeal box could be."	

CLASSROOM ACTIVITIES	HOME ACTIVITIES	RATIONALE
V. The teacher/adult can reinforce play episodes by sitting near the players and focusing attention on their play (e.g., the teacher becomes a facilitator where needed).	Parents maintain a variety of interesting things to look at and discuss, such as books, pictures, learning games, small manipulative objects, feely bag, television.	
VI. The adult provides experiences in which children can act out feelings (e.g., set up a postoffice, puppet theater, picnic). Assign complementary role to shy child. "Could Johnny be your engineer?"		
VII. The adult can provide a model of playfulness by expressing verbal concern about one of the characters in the child's play. "Did your baby's cold get better?"		

PROBLEM SOLVING THROUGH GROSS MOTOR ACTIVITIES AND OUTDOOR PLAY

Gross Motor Activities/Outdoor Play		
I. When teaching and introducing materials for gross motor play, be sure children know what the materials are and can name them — hula hoop, bean bag, jungle gym, etc., so they have the vocabulary. Give children an opportunity to use these words to be sure they know them.	Give children opportunities to play outdoors whenever possible. As they play, name the materials they are using: "You are balancing on that log." "You can jump." "You crawled all the way to the other side."	Predictors of overall effectiveness in problem solving were: • use of accurate labels (vocabulary) • use of comparatives (such as "heavier") • relative absence of irrelevant comments. (1)
II. As children climb the jungle gym or other equipment, teach vocabulary: "You're higher than John." "That rock is heavier than this one."	Try to use words that describe how they are doing an activity — farther, faster, slower, heavier, lighter, big, little. Also use words that describe materials they find outdoors: bumpy, smooth, heavy, sandy, muddy, wrinkled, rough, fine, coarse.	

CLASSROOM ACTIVITIES

III. As children work with sand in a sandbox, for instance, help them focus on the problem at hand and ignore other comments that are irrelevant whenever possible.

IV. Some materials that encourage problem solving outdoors are rollers of various sizes (wooden), croquet sets, kites, parachutes, tetherballs, balls, bean bags for target games and balancing, ladders, and hoops.

V. Give each child in a small group a bean bag. Ask, "How can you carry your bean bag to the other side of the room? . . . without dropping it? . . . without using your hands? . . . fast? . . . slow? . . . backwards? . . . by changing movement, such as crawling? . . . hopping?"

After each crossing, help children generalize what they did. Try to elicit from children why some children made it across successfully and some dropped their bean bag.

Also use empty milk cartons, balloons, etc.

HOME ACTIVITIES

Help children compare what they are doing today with what they did yesterday or a few minutes ago. "When you were little, you ran slower than you do now." "More sand is in the bucket than in the bottle." "Is there more sand in the bucket or in your shoe?"

Help your child tell you about what he/she is doing. "I'm climbing a tree." "This sidewalk is longer than that one."

As you do household tasks, involve your child in carrying different objects: laundry (both clean and dirty), canned goods to the cupboard, glasses to the table or cupboard. Ask your child, "Is it heavy?" "Show me how you carried the towels upstairs." "Can you take more?" "How could you carry more without dropping them?" (Use box, laundry basket, etc.) "Do you carry the laundry as carefully as a glass?"

Magic Carpet Ride

Use a heavy piece of plastic, part of a tablecloth, or a bath towel on a smooth floor surface. Make sure furniture is out of the way. The object of the game is for the child to move himself across the room while one part of his body stays in contact with the magic carpet at all times.

RATIONALE

The process of learning motor skills can be planned as a valuable cognitive experience. As children learn the component parts of the skill and learn how to combine the parts into a skillful and successful whole performance, they are gaining insights into the process of synthesis, which involves the ability

- to generalize about outcomes of efforts
- to contrast differences between movements required for various responses
- to infer consequences of various movement patterns.

These thinking skills have transfer value when utilized in other areas of their learning. (7)

CLASSROOM ACTIVITIES

VI. On the floor, make a river of blue wrapping paper. Have available precut paper rope, black rocks, and a bridge to span the river as children suggest their use.

Ask: "How do you want to get across the river?"
"What other ways could you get across?"

Compare: "Johnny did it the same way as Tanya."

Methods of moving could be hopping, skipping, crawling, jumping, etc.
Speed of movement — fast-slow.
Orientation — frontward-backward-sideways.

HOME ACTIVITIES

"How do you want to get to the corner today? . . . To the bus stop? . . . To a neighbor's house?"
Help the child state that it is hard work hopping all the way to the bus stop and that hopping is better for short distances.

"You are jumping in a straight line."
"Could you jump some other way?" (zig-zag or curvey or sideways).

RATIONALE

Creative play can be taught. The benefits can be seen in measured improvement in general tests of creativity, flexible thinking, problem solving, and other areas. (Research by Sutton-Smith, Hutt, Feitelson, and Ross). (8)

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