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An Introduction to Development of Curriculum for Educable Mentally Retarded Visually Handicapped Adolescents.

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Suggestions for curriculum development for educable mentally handicapped, visually handicapped students aged 13 to 18 years are presented. A discussion of communication skills includes the areas of listening, oral communication, reading, writing, and spelling and teaching methods for each. The goals of the computation skills sequence, basic understanding of mathematical concepts, and transfer of knowledge to other situations are discussed along with skills to be taught. Units are described for instruction in family and social living and health; also described is an industrial arts program involving machine operation techniques, woodworking, metal working, power mechanics, home repairs, electricity, and ceramics. Uses of a sighted guide, arm positions, trailing, squaring off, direction taking, orientation with others and self orientation, and skill testing are outlined in the unit on orientation and mobility. Recommendations are also made in the fields of physical education, science, and social studies. (LE)

AN INTRODUCTION TO DEVELOPMENT OF CURRICULUM FOR EDUCABLE MENTALLY RETARDED VISUALLY HANDICAPPED ADOLESCENTS

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FOREWORD

The goal of this book is to set forth the basic considerations in planning and developing curriculum for adolescents who are both mentally retarded and visually handicapped.

It grew out of an immense need for more specific information about understanding and teaching these children. It is only the beginning step in what we hope will be a succession of materials that will ultimately result in a comprehensive curriculum guide for educable mentally retarded visually handicapped adolescents.

The American Foundation for the Blind wishes to express its deepest appreciation to the International Business Machines Corporation which kindly supported this project with a grant. Most of all, we wish to thank the educators listed on the following page who created this introductory guide.

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INTRODUCTION

Educational programs for blind children have long been well established, while special programs for visually handicapped children with other handicaps is a more recent development. Yet the number of children with multiple impairment is continually increasing, making more educational programs for them imperative.

The need is especially great for children who are visually handicapped and also mentally retarded. Because of this need and because of the dearth of information about such educational sequences, the American Foundation for the Blind two years ago called together eight educators to see if a specific curriculum could be devised. After considering the needs of all visually handicapped mentally retarded children, it became apparent that the greatest need for more information and direction was in the adolescent age group. For that reason, the educators were asked to develop a curriculum for educable mentally retarded visually handicapped (EMRVH) adolescents.

All the contributors had extensive experience in teaching either blind or mentally retarded children. They gathered material used in school programs for normal sighted and normal visually handicapped children and for sighted mentally retarded children, but quickly discovered that there was very little written material available about educational sequences for children who were both mentally retarded and visually handicapped. Drawing on their own experiences in adapting material to the needs of visually handicapped or mentally retarded children, they soon realized that many more adaptions are necessary to meet the special needs of children with both handicaps.

Because of the scarcity of written material (primarily because of lack of experience), the educators could not write a specific curricular plan based on a large amount of data from practical experience. Had they attempted to detail actual experience, there would have been only a few pages in this book. Instead, they chose to set forth those ideas that should be considered in developing a curriculum especially for the EMRVH adolescent. This book introduces those considerations.

It is expected that as more practitioners become involved in teaching these special children, more concrete information will become available and will be added to the basic material presented here.

The suggestions offered here are basic to all curriculum development and may be used in any school setting: a residential school for the blind or mentally retarded; a special education room in a community school; or a regular classroom. They may be used with a whole class of children who have essentially the same handicaps or they may be used with one child in a special class for mentally retarded children. The main point, of course, is to adapt the teaching material to each child's level of functioning and to provide him with the special tools required by his visual impairment.

The person being considered in this book is adolescent—between the ages of 13 and 18; is mentally retarded but educable, which means that he has an IQ between 50

and 75; and is sufficiently visually handicapped to require special tools for reading and writing. He may also have additional impairments that further complicate teaching.

The degrees of visual impairment and mental retardation may vary over a wide range among children in the same class, and the degrees of handicaps in individual children may be in any number of combinations. The teacher must deal with each child separately, adapting technique to the individual constellation of impairments. For some children, the major problem will be a high degree of mental retardation and a low degree of visual loss; for others, it will be reversed; and for others, it will be any number of combinations.

Adolescence also creates special problems. For normal children, it is a time of immense change. The EMRVH adolescent feels many of the same pressures that the non-handicapped boy or girl does. But the EMRVH may not be intellectually equipped to deal with these feelings and pressures, and the teacher must help him arrive at some solution within the bounds of his mental and visual handicaps.

As noted before, each child requires individual attention and special adaptation of teaching methods. He also requires careful direction and the teaching of many topics that the normal sighted child learns incidentally in his everyday life.

Every possible experience should be provided to give the EMRVH adolescent the opportunity to participate to his highest social, cultural, intellectual, and vocational level. All his training must be meaningful, satisfying, and within his capacity to achieve. Such programming must, of necessity, exclude some material found in school programs for the normal child. To act with comprehension and judgment the retarded child must know what is expected of him and engage in activities closely related to day-by-day life; thus the suggestions in later sections of this book that urge the use of real things—real money, real dishes, and real tools.

With mentally retarded children, most of their learning is gained by actual doing since ability to abstract is exceedingly limited. Thus teaching must be in the concrete, rather than the abstract, as illustrated in the section on science.

It is necessary to provide many similar experiences over a long period of time so that good habits of thought and action may be established. These children must solve their problems of living over and over again at their own rate of learning in order for them to develop a simple pattern of action before proceeding to a more complex activity. Teaching material which is unrelated to experience results in frustrations, conflicts, and poor behavior.

It can be expected that most of the children under consideration will reach about the academic level of the normal third or fourth grader, although there may be considerable variation in accomplishment in the various curricular areas. One child may not learn to read and write braille, but function fairly well in industrial arts; another may read and write braille or large type, but not be able to grasp the basic concepts of science. Again, the teacher must experiment with what the child can do and set goals accordingly.

Mental retardation obviously limits the level of accomplishment; the problems created by mental retardation are further complicated by the lack of normal vision, which immediately limits the amount of information that the child can assimilate. He has to depend on his remaining senses or a limited amount of vision, and he has to learn certain special techniques that are not required of the sighted mentally retarded child. The learning of these special techniques often takes time and energy that would otherwise go into other areas.

Innumerable educational aids have been devised for blind and visually handicapped persons. Many of them can be used by a mentally retarded visually handicapped child. Teachers and others concerned with the child must find the appropriate tools and adapt them, if necessary, for use by the retarded child.

One of the most important special techniques that the visually handicapped child must learn is that of mobility. For that reason, a special chapter outlines the techniques of teaching mobility and orientation.

Turning now to the last distinguishing feature of the children—adolescence, it is during that period that all children, handicapped or not, move from the relative dependency of childhood into the beginnings of adult responsibility. Much foresight in planning of experiences and the provision of training is required. The change from dependence to independence does not come overnight, on a given birthday, or at the end of a school term. Preparation for successful adjustment, both social and vocational, as far as the school is concerned, begins on the day the child enters. Helping the child, regardless of his age, to understand himself as a working member of a group and as one having a responsibility to others, is the first step in developing a sense of social values, obligations, and the rights of others. Such an elementary concept as helping the child to understand the need for getting to school on time and to his classes promptly is the first step in developing punctuality as a obligation that he will one day owe to his employer.

While the preceding applies to all children, it is especially urgent that the EMRVH child receive help in understanding the need for and the responsibilities of independence—always, of course, within the bounds of his own capacities.

These children also require another type of special attention—preparation for employment, or at least preparation for preparing for employment. Once these young people leave the residential or public school, they will go directly to work, if they are capable of employment. They will not remain in school; at the most, they will go through some sort of vocational training offered by rehabilitation programs.

Since such training is already long, it would be well if the schools could prepare the EMRVH in the early or pre-vocational phases of employment.

Such pre-vocational training has not generally been a major part of school programs in the past, but education generally has expanded in recent years beyond the usual reading, writing, and arithmetic to include vocational or pre-vocational programs for normal children. Logically such training should also be given to EMRVH youth, especially when it is remembered that their adolescent schooling is probably terminal.

In addition to teaching these children the basics of arithmetic, punctuality, cooperation, and such, the schools can well teach them some of the practical aspects and ways of working. It should be possible for visually handicapped individuals as well as mentally retarded persons to find placement in a large variety of work situations: dishwashing maching operations, film developing, bakery operations, laundry and dry cleaning tasks, certain garment industry positions, hospital services, and greenhouse and nursery work.

EMRVH youth can learn the basics of some of these jobs within the school situation. It should be made clear, however, that no attempt is being made to suggest total vocational training in the school program, but the school can, with relatively inexpensive, but creative changes and additions, produce a student who has had valuable training and experience in a number of areas.

In-school training in specific, meaningful job areas offers the instructor and the student an opportunity to evaluate skills in tactile perception, finger dexterity, body coordination, orientation perception, working speed, learning ability, accuracy, need for supervision, and above all, work tolerance.

The in-school training must have an evaluation process. Accurately kept and easily understood records of each student's progress in work situations and pre-vocational training prove invaluable to school guidance counselors and state rehabilitation personnel who must evaluate the individual's potential and interest in a number of job fields. Adequate evaluation and use of such records, acquirable only from work situations, will result in fewer distresses to client and rehabilitation personnel, and above all, will ensure that the on-the-job training program will be more effective for the client.

It is impossible to establish a specific set of pre-vocational experiences that each student should have, but basic experiences for evaluation may be outlined and taught with daily evaluation being made by the teacher. Some general areas of concern should be: (1) work preferences, (2) work attitudes, (3) attitudes toward supervision, and (4) personal adjustment or grooming skills.

In many of the occupations judged suitable for EMRVH students, pre-vocational programs can be developed in the school setting. Again, the different types of training vary from residential setting to public school program. For example, a laundry worker experience would probably be non-existent in a public school, but could be developed into a good training program in a residential setting. The development of pre-vocational training depends upon the school setting and the resources available in the school and community. Some possible training experiences that could be developed in school settings include greenhouse and nursery work; animal husbandry; food service; laundry service, and sub-contract shop work.

Even without specific pre-vocational training classes, each teacher of each subject area can start preparing the EMRVH child to understand the basic concepts of punctuality, honesty, quality workmanship, and so on.

For the EMRVH a lack of self-esteem is a special problem, but the teacher can help develop that esteem by always scaling task length to present tolerance levels; scaling task difficulty to present accomplishment levels; providing sufficient repetitions for mastery; providing positive reinforcement, and respecting the worth of the individual child.

Whether an EMRVH youth eventually works or not, he can still function as an effective member of his own household or social group, and thus, the basic goal of teaching is to help the EMRVH youth achieve his maximum potential and possess a sense of self-adequacy.

This, then is a profile of the youth under consideration in the following pages: he is capable of being educated, mentally retarded, and visually handicapped to some degree; he is chronologically an adolescent; he probably has had few satisfactory experiences with school or the teaching process; he needs very special and individual help to develop his potential; his program must be planned with an eye to his past performance and opportunities and with a creative vision of the possibilities for living and working in his community in the future.

COMMUNICATION SKILLS

Communication—listening, speaking, reading, and writing—has a high value in our culture and the major share of each dollar spent for elementary education enriches instruction and remediation in this area. Children who have marked deficiencies in these important skills are surrounded with concern, anxiety, and failure very early in their school careers.

Diagnosis, therapy, remediation, and/or special education are offered in most schools and a new vocabulary for describing these problems or these children has emerged. "Non-readers," "problem readers," "learning disabilities," "minimal brain injury (or dysfunction)", "perceptual problems," "under-achiever," and a variety of other terms which fluctuate in popularity are evidence of the attempt to describe (and unfortunately to categorize) children who have problems of communication.

Children who have extreme deficiencies in the communication skills are usually assumed to be "handicapped" and are afforded "special education." Those who have no obvious physical or mental handicaps but who do not learn to read, write, spell, speak, or listen on the time-table called "within the normal range," are taught by remedial reading and speech correction teachers, now employed in most school districts. (It is interesting to note that remedial listening has yet to be part of most remediation curricula.)

Delays in development of inner communication, of concept formation, of language as communication (as opposed to mere speech production) are recognized as manifestations of severe physical, emotional, or intellectual handicaps, and most special education programs stress early identification and intervention. However, many of the EMRVH youth who are the concern of this book entered school before such early identification, evaluation, and specialist help were available, and they will have experienced early failure in all areas of communication. Thus their teachers need to design a very practical, experience-oriented language arts program with both remedial and new-ways-of-learning components.

It is assumed that educable retarded youth who have no marked visual loss will achieve approximately third or fourth grade reading levels. Reading achievement levels have not been established for EMRVH students who read braille or large print or who use low vision aids. It is safe to predict, however, that most EMRVH adolescents will not have acquired communication skills which enable them to carry on useful social and school activities appropriate to their chronological ages. Daily communication requirements such as telephoning, writing letters or notes, reading simple instructions, planning activities with friends serve as realistic take-off points for these students. Early failure and apprehension are more easily forgotten if language arts are presented as essential and enjoyable aspects of each day's activities. Visually handicapped children usually, though not universally, have positive reactions to listening experiences. This does not mean that they listen well but rather that auditory learning is acceptable. Unfortunately, some EMRVH students will have the same negative attitudes toward listening as they may have toward

reading, and almost all will need a remedial program designed to substitute useful skills for useless ones.

LISTENING

Since good listening skills and habits are of such obvious importance to students who have visual handicaps, it is appropriate to emphasize this area by listing it first in any discussion of communications skills for EMRVH. The acquisition of effective listening habits is easier if students are urged to think critically about what they hear and to discuss their own ideas on the subject; if listening becomes part of the regular classroom routine instead of a special "subject;" *and* if students see a purpose in listening activities. Of course, all listening is part of the in-take process but EMRVH students *will listen to what they hear* if they understand that there are different ways of and various purposes for listening.

For all visually handicapped persons orientational or environmental listening is of prime importance. Environmental sounds provide important cues to all people to avoid hazards and to verify status. Total or extensive loss of vision places a greater burden on the sense of hearing and heightens the need to use sounds for orientation and safety.

Listening for information or listening to learn will appeal to EMRVH students if the information is essential to their activities and if they know that what is learned will be useful in today's or tomorrow's projects. Each student must become actively involved in thinking and talking about what he hears. Constructive listening involves attention, interpretation, and selection and rejection of ideas. It is particularly important that teachers of EMRVH youth encourage their students to discuss what they hear and what they believe because the handicap of mental retardation and that of visual loss often result in poor concept formation.

Listening as recreation is a commonplace experience in our world of radio, television, disc, and tape. Students who have visual and mental handicaps may be more dependent upon listening as recreation as a direct consequence of decreased independent mobility. These students must be taught to use listening for enjoyable leisure.

ORAL COMMUNICATION

Because of the varied effects of sensory and cognitive anomalies, many EMRVH students have had fewer satisfactory verbal experiences than other students of their age. Clear, articulate speech which expresses needs, desires, and ideas may still be difficult for these students. It is probable that they will need practice in asking and giving directions, greeting friends and visitors, expressing gratitude, and expressing their own ideas.

It is not unusual to find visually handicapped students whose verbal fluency far outstrips their reading and listening comprehension. Parents and teachers quite normally attempt to use words to help a child understand what he cannot see. Thus, some EMRVH students use words which have no real meaning to them. First-hand contact with objects; personal experiences of success, failure, joy, and sorrow; and free choice and limits are essential. Unless teachers are constantly alert to this necessity for real experiences, the "don't touch" taboos of our society will restrict EMRVH students to verbal descriptions of objects and situations as seen through someone else's eyes.

READING

Reading for the educable mentally retarded visually handicapped adolescent student must be a highly integrated part of his educational program if it is to be effective. Concepts acquired through school experiences such as are found in family and social living, industrial arts, and physical education provide the content for meaningful reading experiences. Materials used in this program must be teacher-made to meet the needs of each student in accordance with his experience. Generally, content from basic reading texts does not appeal to these students since it is written for the younger child. Far better that he read a few words with understanding and enjoyment than labor through several pages of material designed for pupils many years younger.

When a student cannot read, ways must be found to create an interest and a desire to learn. This may be encouraged in the non-reading adolescent through the handling and examination of many books containing a variety of tactile materials purposefully arranged. Such sensory materials may be the means of motivating the student's interest in book content. These books, perhaps of unique shape or size, may have covers of cardboard, plywood, leather, or synthetic materials, and contain objects which are fastened directly to the pages or held in envelopes.

When the child has developed concepts of objects and people, the teacher introduces the brailled or printed words which stand for these concepts. The student is helped to run his fingers lightly across the words and read with the teacher. This brings him success from the beginning. Lines are double-spaced and only simple punctuation used. Some evidence has indicated that in the case of severe learning deficiency, the letters of words should be double-spaced and all punctuation omitted until fundamental concepts have been achieved.

It is important that each student experience progress immediately. When certain words have become a part of the student's early reading vocabulary, work-type lessons should be developed in which he is given an opportunity to review familiar words and undertake new words. Another type of work lesson may involve an activity which requires the child to read and follow directions. For example, he may be directed to place one object inside another or arrange items in sequence. If a student reaches a plateau in his reading achievement, the teacher should inject enough new material to stimulate his curiosity and give him an opportunity to reach beyond his current level of functioning. When a student does acquire a usable skill in reading, it is the teacher's responsibility to see that he is introduced to meaningful material that is appealing and that will lead to further learning, thus creating experiences which will insure successful learning and enhance ego concepts. Material which is adapted to his needs, appropriate to his level of achievement, and in harmony with his interests will be useful in the ultimate accomplishment of these goals.

WRITING AND SPELLING

The fourth phase in the development of communicative skills is the introduction of writing and spelling. These areas of learning allow the child to communicate his thoughts and ideas in a permanent way. The program of writing and spelling evolves from the experience of the student and is integrated into all phases of the curriculum. The EMRVH youth is helped to understand the value of writing names, telephone numbers, and addresses, labeling drugs and foods, and writing notes to friends.

Writing is introduced when the student has developed minimal ability in reading—when he is able to read 30 to 40 words with a fair degree of success. The writing the

youth does is based on need, experience, and desire. He is taught to write phrases and sentences that accurately state thoughts and that incorporate his reading vocabulary. Utilization of the familiar enables him to read what he writes.

SUBJECT SUGGESTIONS

Following are detailed suggestions for teaching listening, oral communication, reading, and writing and spelling.

Listening

Listening as orientation. Listening to sounds in the environment: familiar indoor sounds (home, school, grocery, drug store, church, department store, hardware store, barn, garage, etc.); familiar outdoor sounds (neighborhood, park, beach, forest, city, sports area, farm, thunder, rain, snow); unusual location or equipment (machines, fire engines, police cars, industrial equipment, construction equipment); danger signals (sirens, crackling fire, bells, screeching brakes).

Using sound clues: selecting objects or locations that are frequently used; determining whether there are unique sounds in these objects or locations; determining whether there are identifiable sounds in the vicinity of objects or locations; establishing a routine for using the most useful clues for locating and reaching objects or locations; establishing habits of ignoring useless sounds that divert attention from efficient location of objects or locations.

Listening to learn. What to listen for: main ideas, details, propaganda. Types of listening experiences: narrative (a story, past, present, or future that is factual or fictional); expositive (an explanation or detailed statement about "how to do it" or "how to make it"); directive (authoritative instructions or directions); aesthetic (drama, poetry, music, prose, sounds of nature).

Listening as recreation. What to listen for: mood, story, theme, rhythm, cadence. Types of listening experiences: literature (verbal or recorded poetry, prose drama); music (live and recorded concerts, both amatuer and professional; exposure to sounds of separate instruments); nature walks (at various times of day and in various places; bird songs, wind in the trees, traffic rhythm, voices, animal sounds).

Oral Communication

Expression of basic needs. Understanding of proper vocabulary. Understanding of sources of help (nurse, teacher, custodian, clerk, police, and fireman). Understanding of emergency equipment or procedures (telephone, fire alarm, burglar alarm, elevator alarm).

Expression of emotions. Importance of expression of feelings and emotions in appropriate ways. Importance of choosing appropriate confidantes.

Social communication. Use of vocabulary and idiom in different social settings: in peer groups, in class, on the job, with adults. Techniques which increase social acceptance: facing person spoken to, asking questions to demonstrate interest, knowing rules of games, hobbies, acceptable jokes, latest news and sports.

Reading Skills

Initial braille reading skills. Handling and use of books: locating the top, bottom; right, and left sides of the book; opening books and turning pages with ease; handling books of different sizes, shapes, and ways of opening; locating place in reading by use of a ribbon; locating and reading the name of the book; locating and reading the number of each page; locating the list of stories at the beginning of the book; reading the name of each story and the listed page; locating the word list at the close of each book; reading the words in columns.

Developing hand techniques: moving fingers easily and lightly across each line of braille; using slightly curved fingers when reading; using left and right index fingers independently; avoiding continuous backward sweep of fingers.

Initial large print reading skills. Handling and use of books: using a reading rack to bring books to a satisfactory reading range; moving book to any position for satisfactory reading; using the table of contents to find story and listed page; locating the word list at the close of each book.

Developing eye skills: observing details in pictures; observing likenesses and differences in words; using left to right eye movements; choosing print that is easy to read; using card, strip of cardboard, or pointer if student requires help in focusing on lines or words.

Sight vocabulary. Recognizing familiar words. Understanding familiar words. Using familiar words.

Word attack skills. Phonics: initial sounds, medial sounds, and ending sounds. Context clues. Configuration.

Functional reading. Arithmetical devices: clock, calendar, measuring instrument. Labels. Simple directions. Addresses and telephone numbers. Recipes.

Pleasurable reading. Correspondence. Experience stories. Rhymes and stories. Assembly programs. Menus.

Subsequent reading skills. Sight reading: arithmetic, science, industrial arts, and occupational vocabularies. Word attack: phonics, medial sounds, blends, prefixes, suffixes, advanced context clues. Comprehension: selecting main ideas, noting details, recognizing propaganda, and correlating with previous knowledge. Pleasurable reading: magazines and newspapers, fiction, drama, and poetry. Study aids: table of contents, glossary, index, appendix, dictionaries, encyclopedia, library facilities.

Writing and Spelling

Equipment. For blind children, the necessary equipment includes a braillewriter, slate and stylus, typewriter, and pencil and pen, while for partially sighted children, it includes felt-tip pens, dark, non-smear lead pencils, paper with wide, dark lines, typewriter, tilt-top desks, and pen and pencil.

The use of regular pen-pencil-paper combinations should always be considered for partially sighted children capable of their use—not because they are the tools of the "sighted" world, but because many visually limited children, including those who

are retarded, may actually function better with such tools than with the specialized writing equipment usually supplied. It is a common fallacy of many who teach the visually handicapped that limited vision must be compensated for by excessive lighting combined with highly contrasting, heavy-lined writing equipment. While this may be true in some instances, it is not invariably so. The great variety of ways in which visual impairment manifests itself demands that no user of this book should be persuaded to exclude from his approach the possibility that one or more of his charges may actually function better with ordinary lined paper and a ballpoint pen. In fact, *every* EMRVH who can learn to write in a visual medium can, and should, master a consistent and legible signature with a pen, even if he cannot read it.

Procedure. The first words the child learns to write should be simple and related to his personal needs (addresses, telephone numbers, names, labels), progressing to simple sentences and then to short paragraphs (notes to friends, directions to the store, compositions about experiences).

Since the child is learning to spell at the same time he is learning to write, the first words he learns are those that relate to his personal needs, expanding finally to include words from stories, subject matter areas, and guide books. In teaching spelling, the usual procedure is followed of discussing meaning and use; discussing the configuration of the word; analyzing the word; using the word in sentence; writing the word by itself, and finally writing a sentence using it.

COMPUTATION SKILLS

The computation skills sequence has two goals: (1) to develop basic understanding, accuracy, and facility in the fundamental process of computation, and (2) to develop ability to transfer the problem-solving technique to other situations.

It is important that attention be given in learning activities to fundamental principles of mathematics, and, at the same time, that significant applications are made within the learner's range of understanding and interest.

Mathematics is most easily understood by the EMRVH adolescent when it is integrated with other areas of learning and related to daily living. Integration of subject areas is accomplished through careful planning of daily schedules and curriculum adjustment. In a woodworking class, for example, most pupils see that two legs at the left of the table and two legs at the right of the table total four. However, with the EMRVH this conceptualization has to be developed through skillful teacher guidance. Time must be taken by the class and the instructor to insure the transfer of an understanding in one situation to a similar experience in another. Thus, the concept "four" may be further developed when the pupil dusts a table and is cognizant of dusting four table legs.

The teacher should plan an environment involving many problem solving situations. A trip taken on the bus requires knowledge of the time the bus leaves, the amount of money required for the fare, and the length of time needed to fulfill the purpose of the trip. Thus, through practical application of learning, useful, meaningful knowledge is developed. Mathematical vocabulary should be used throughout the school day in every area of learning. The pupil should use terms such as big, little, long, short,. heavy, light, to express meaning whenever the necessity arises.

Most educable retarded pupils can be expected to reach at least the third grade in arithmetic, but there is every possibility of finding some pupils who can use only the most elementary processes to solve problems. No matter what level of ability the student ultimately reaches, his learning should be based on meaning—meaning of number, organizing for counting, groupings for number value, and transferring acquired skills to everyday life situations.

VOCABULARY WHICH CONVEYS MATHEMATICAL CONCEPTS

The following mathematical vocabulary is a major part of the teaching of computation skills to the EMRVH youth. The vocabulary is made meaningful through the repetition of the terms in every situation where they apply.

Amount—numerals (one, eight, fifteen); plural objects (shoes, mittens, boots); indeterminate quantities (sand, leaves, grass).

Time—daily activity words (hour, minute, seconds); longer time units (days, months, years); units of weights and measures (ounces, pounds, ton, dry, liquid).

Proportion—large, small, big, little, long, short, heavy, light, long, short.
Position—up, down, above, below, high, low, before, after, first, middle, last, right, between, left, top, bottom, side, edge, end, first, fifth, eighth.

Form—circle, triangle, square, rectangle.

Relationship—parallel, right angle, perpendicular, intersection.

Order—next to, across from, upper half, lower half, in, out, center, middle.

Speed—fast, slow, hurry, quick, short, long, close, away.

Distance—near, far, short, long, close, distant.

TYPES OF SKILLS

Three types of computation skills should be taught to the EMRVH youngster:

Knowledge of the number system. Numerals are arranged in ordinal sequence and are related; numbers are added, subtracted, multiplied and divided; numerals are groups. Groups are related, added, subtracted, multiplied, and divided.

Knowledge of money. Money is recognized through distinguishing real coins; counted by ones, fives, and tens; earned through work; of value for livelihood.

Knowledge of fractional parts. One half, one fourth, etc., one half cup, one teaspoon, one tablespoon in cooking; one inch, six inches in measuring; fifteen minutes, thirty minutes in measuring time; a dime, a quarter, and half dollar.

Industrial arts and home living skills involve many fractional parts and offer an excellent opportunity to teach the concepts.

FAMILY AND SOCIAL LIVING

Social skills are an outgrowth of family living skills. Instruction in social living is more effective if such instruction is deliberate and progressive. The goal of the program in family and social living is to prepare the child to be a contributing member of his society within his capabilities.

If these are thought of as skills in total living, it follows that a student needs instruction in many aspects of a broad spectrum. Integrated in the program is instruction in care of the home, shopping, cooking, sewing, etiquette, child care, entertaining, budgeting, banking, emergencies in life, social interaction, sex education, and use of leisure. It is hoped that some of these skills are taught in the home environment, but realistically it is expected that teachers in a school setting will feel responsible also for filling in the gaps of knowledge—or perhaps giving total instruction if it proves necessary and feasible.

Some EMRVH youngsters will profit more from effort expended on the development of home living skills than from emphasis on academic performance. The individual who is able to maintain himself in his home with some degree of independence will enhance his self-concept and be more acceptable to other family members.

Experience in the performance of simple household tasks provides the individual with skills which can be used at home. Setting the table, making beds, and hanging up clothing can reasonably be expected of EMRVH students, and are positive contributions to the operation of a home. The more the individual is able to contribute to family living, the less responsibility other members will have to assume, and the more the individual will feel he is a useful member of his family group.

All people have a need for friends and the EMRVH youngster shares this need; however, he is frequently prevented from fulfilling his desire for friendship because of his limitations. Therefore, an effort should be made in school to create situations that foster desirable social characteristics—friendliness, courtesy, and thoughtfulness.

It is accepted fully that most of the topics mentioned above are those which are proper to include in any school curriculum. The one area that often proves troublesome is sex education, yet recent trends place it increasingly in the school setting as part of the curriculum.

Because of the serious social and health problems that may arise from the lack of knowledge pertaining to sexual development, it is important that attention be given to it. However, it is impossible at this time to set forth detailed suggestions for teaching the subject to EMRVH children, primarily because of lack of experience. It is hoped that eventually a detailed guide will be worked out and published. In the meantime it is suggested that the curriculum of any enlightened school district be used and adapted for these special children.

Following is an outline of suggested topics to be included in any program on family and social living. It is expected that adaptations will have to be made, depending on the degree of mental retardation present and/or on the degree of visual handicap. The teacher will have to judge the limitations of each individual to permit the absorption of material in order to slant it properly for the maximum comprehension. No one formula can be given for imparting the various phases of instruction, the timing of presentation, or the ultimate comprehension of the material.

Instruction in family living includes:

Care of the home. Cleaning, laundering, maintenance, repair, room furnishing and decorating.

Shopping. Groceries, clothing, personal needs.

Purchasing. Stores, value buying, appropriate selection.

Cooking and sewing. Planning meals, selecting materials, using recipes and patterns, selecting and adapting utensils and equipment, and serving food.

Necessary adaptations in cooking include labeling all foods the student uses; labeling equipment as necessary, such as measuring devices; teaching special methods of measuring liquid and dry ingredients accurately and easily; teaching methods for testing cooked foods. In sewing, adaptations include the use of special devices such as a needle threader or braille or large print measuring devices; marking of equipment by color, weight, thickness; use and adaptation of sewing machine; use and marking of patterns.

Etiquette. Skills at the table to locate objects; use of proper dishes and silverware; common niceties in table manners.

Child Care. Meeting physical, emotional, and educational needs.

Entertaining. Inviting guests, choosing refreshments; planning activities.

Budgeting and banking. Providing for necessities such as food, medicine, clothing, taxes, recreation, financial emergencies; providing for emergencies such as loss of job, accident, serious illness, death in family, robbery, fire, law suit, arrest.

Social interaction. Courtesy, friendliness, initiative, and cooperation. These youths need to discuss various aspects of social interaction such as the development of friendship, choosing friends, interaction between friends which involves sharing actitivies, helping as need arises, exchanging remembrances, and keeping confidences.

Social living in the friendship groups, neighborhood, or larger community involves a know-how which often comes naturally and spontaneously. However, the EMRVH youth is not always in a position to learn such matters informally or easily; therefore instruction needs to be given in specific areas.

Leisure Activities. The EMRVH person in common with all others has a need to use the major portion of his free time in some constructive manner. Every area of learning in the integrated educational program can ultimately contribute to the

development of leisure-time activity and this end should be an item for consideration at all stages of planning the curriculum.

Development of a pleasing personality and specific skills promote growth in effective social interaction. Home living class instruction in the techniques of cooking and entertaining provide the skills required to take an active part in many group situations. A walk to the neighborhood grocery store or to visit a neightbor is a satisfying way to spend an afternoon, and is made possible by the skills developed in the orientation and mobility program and in the communicative skills classrooms. Listening to musical performances and talking book records, reading recipes to prepare favorite foods, and working with hobbies are worthwhile interests and purposeful ways of spending free time. As such they deserve a place in any school program so that when a student leaves the school environment he will have developed some established patterns of self-directed and satisfying leisure activities that can be continued in adult life.

Leisure activities can be developed for individual or group enjoyment. All this, of course, is dependent on learning some social skills and also liking them enough to continue them outside the school setting. There are many types of activities toward which the EMRVH student might be directed, depending, of course, upon his own inclinations and skills. These cover the gamut of activities from reading and hobbies which might be done alone to group activities such as dancing, playing in musical groups, parties, picnicking, etc. It should be stressed, however, that all individuals do not enjoy the same means of expressing themselves in leisure and no one type of activity should be stressed or advocated at the expense of others; there should be exposure to many different types.

HEALTH

The consideration of health concepts and the understanding of its components should include material on nutrition, rest, and exercise as they relate to the body, its physical structure, and its needs.

Good health is a contributing factor to success; the healthy individual is better prepared to do his work, and to find satisfaction in the knowledge that he is able to contribute to his continuing healthful state and personal appearance. Satisfaction of this nature is especially valuable to the enhancement of an adolescent's self-image.

Correct development and function of bodily parts is partly dependent upon proper diet and proper foods. Nutrition involves a knowledge of health needs, dietary requirements, food values, and food selection, preparation, and preservation. Thus, this section includes provision for instruction in proper diet and indicates its effects on body systems. Food selection and the need for preparation and preservation are correlated with learning developed in family living, home economics, and language art classes.

The benefits derived from adequate rest and exercise play an important role in the student's ability to function. Rest and exercise promote good physical health and emotional stability, as well as contributing to the student's readiness to meet the demands and tensions of school and society.

Since there is a high incidence of health problems among the EMRVH, stress on health education is essential for this group. The EMRVH youngster should learn to care for his own health needs to the greatest degree possible, and ordinarily he can learn the necessary habits. An understanding of the importance of diet and the need for rest, exercise, and prescribed medication will help him accept this responsibility for the care of his own body.

The depth of presentation of this material must be determined by the capabilities of the student. The teacher may wish to teach skeletal structure, muscular development, and internal organ arrangement as an entity, even using technical terminology, with certain students. Other class members, however, will be confused by such technicality, and for them only basics should be emphasized.

The core of material presented is the same as that for the average student, but it will need adaptation by the teacher in order to be comprehensible to the special student.

Physical structure. Each unit should cover the structure, function, and care of the specific topic: skeleton, muscles, internal organs, skin, hair and nails, teeth, eyes, ears, nose and throat, and feet.

Nutrition. EMRVH students should be encouraged to choose foods for their nutritional value rather than for convenience and comfort in handling. Taking this information into account, the following topics should be presented: chemical needs of the body (proteins, minerals, carbohydrates, fat, vitamins); body systems involved in nutrition—digestive and excretory systems (simple structure, function, proper medication); and nutritional needs for balanced diet, and effects on health and physical appearance.

Exercise. Too frequently overlooked in a program for EMRVH adolescents, physical exercise provides students with an outlet for pent-up emotions and tension, Following are suggestions for a unit on the need for adequate rest and exercise: rest (benefits to physical and mental health); setting (appropriate hour of day, place, and length of time); conditions affecting sleep (illness, emotions, activities); exercise (purpose, effects, types, precautions).

Illness. The EMRVH adolescent who attains some degree of independence should be able to recognize common symptons of illness such as high temperature, aching muscles, and sore throat. Also it is important that he have some knowledge of first aid techniques and be able to understand and follow medical advice. He should be alerted against using excessive medication, following non-professional advice, and exhibiting needless anxiety about minor illnesses and injuries. The following material are suggestions for lesson planning on physical illness: causes (bacteria, viruses, fungi, blows, cuts, burns, falls); prevention (cleanliness, immunization, periodic medical examinations); treatment (first aid techniques, medical advice, prescribed medication).

INDUSTRIAL ARTS

An industrial arts program is aimed at and should gradually progress toward the development of knowledge and skills that will be of practical use to the individual in the family and community environment. Industrial arts should also help the student to become more aware of this country's vast industrial potential and diversity and to help him realize that with proper training he can take his place as a productive worker in a capacity that will be rewarding to himself and a contribution to others.

Industrial arts instruction should not be limited to the classroom but should also offer opportunities to explore the outside world. When properly introduced, all children benefit from field trips on the school grounds and to industry. For example, a course in plastics might begin with listing all the items the students have encountered that are made of plastics. Next, a field trip through the building and around the school grounds would illustrate to the student many more applications where plastics are of major importance. This, followed by a trip to a local plant manufacturing plastics or using them in industrial applications, together with a concluding discussion of the activities, operations, and working conditions observed, and potential job possibilities, would complete an interesting and practical unit.

A fundamental understanding of several industrial processes should result from the student's industrial arts experience. He should have a basic understanding of how various industrial areas (wood, metal, ceramics, etc.) are interdependent and interrelated. Many schools have developed a home mechanics or home repair subject area. Knowledge and skill in performing the simple procedures involved help increase self-esteem, minimize repair expenses and the inconvenience of waiting for journeymen, and may make possible the prevention of more extensive damage or inconvenience.

A realization of the importance of quality in production work should make the pupil more knowledgeable as a consumer. The instructor should devote a considerable portion of time to this area, considering not only mechanical items but also the areas of shopping (including food and clothing), and the purchases of services.

In the section, it is assumed that the student has already had extensive experiences and has some facility in the hand-tool skills involved in crafts and elementary industrial arts programs. It is designed to further the pupil's training in later industrial arts skills; to increase his fund of related information; to introduce him to and give him extensive practice in power tool operation; and to provide pre-occupational or employability training experiences. While some craft activities may still be included in the program, it is suggested that the primary emphasis for pupils of this age be placed on the useful home mechanics and power tool operation phases of industrial arts, and upon pre-vocational training. Specific job training should be considered as more often falling within the purview of the state vocational rehabilitation department.

In some instances, however, entering the program may be some pupils whose prior crafts and industrial arts experiences have been limited or non-existent. In

these cases, no time should be lost in providing selected experiences as deemed necessary. A simplified industrial arts outline is included in this guide in case the above situation applies; again, primary emphasis should be placed, at this age level, on the use of power equipment and employability training experiences. In most cases, when the student reaches adolescence, he is ready physically to work on power equipment. His mental readiness, however, may not complement his physical growth, and the instructor must realize that each step of instruction should be easy to understand, within the student's mental capacity, and controlled to present no avoidable safety hazard.

The following are outlines of shop orientation, machine operation techniques, and limited outlines of subject areas to be covered. In each subject area, as much use of power equipment should be made as is possible; experience has shown that the EMRVH student is far more productive and accurate when using machine operations than hand operations.

CLASSROOM ORIENTATION

The student is expected to report to the entrance of the classroom at the scheduled time. The instructor should meet the student at the door and use the sighted guide technique for initial orientation. It is desirable to have an area (home base) within the room to which the student reports each day prior to starting work and prior to leaving the room, until such time as he is thoroughly oriented. Reporting to this area does two things: it provides the student with a familiar reference point and it gives him time to settle down and orient his mind to a work situation.

The instructor should devote special consideration to developing a logical and efficient path or travel route within the room. Using proper sighted guide techniques the instructor should take each student on an introductory tour of the room. This is a general information tour and as such the student is not expected to remember the name, location, and function of each piece of equipment encountered. Many of these items he may not use for several months or even years. It is not necessary to use great detail in this tour and each machine should take only one or two minutes to describe briefly.

The names of the equipment are unimportant for this discussion; however, they should be mentioned to the student and referred to frequently. It should not be expected that the student will remember all the paths, but an introduction has been made and with repeated exposure and patience the student will eventually move freely along the routes most important to him. Once the student has experienced the general tour, allow him an opportunity to practice traveling from the entrance to the home base and return. The home base should be located so that a minimum of time and effort will be needed to master this exercise.

With the student sitting or standing at home base, the teacher should assure him that his present location is safe. Next explain to the student that each machine in the room will be turned on one at a time by the instructor. There are two reasons for this step: it helps to acquaint the students with the sounds of each machine from a distance, and it helps to orient him to the relative position of each machine to the home base.

The student should be encouraged to use residual vision to fullest advantage, but not to the point where it interferes with safe work practices. Lights, windows, doorways, and exit lights help orient the student who has some vision.

MACHINE OPERATION TECHNIQUES

Before the EMRVH student starts to learn how to make things, he first must learn how to operate the machines found in the industrial arts room. But even before that, he must learn certain basic well defined patterns of safety.

The EMRVH student should wear the same safety equipment that other students in the class are required to wear, including safety glasses. The absence of sight does not reduce pain or infection caused by a piece of flying wood, metal, or plastic.

There is a basic four-step pattern of safety that has been devised for use by blind persons and is strongly recommended here for use by EMRVH youth. Certain modifications have been made in light of recent developments in orientation and mobility techniques.

Before starting to teach the pattern to the EMRVH youth, the instructor should make sure that the machine remains motionless throughout the instructions, even though the switch may accidentally be turned to the "on" position.

Four-Step Pattern of Safety*

I. Approach; initial contact with power machines.

   A. Using the forearm across the body and the other hand and arm for lower objects, the student should approach and make contact with the machine. Due to the various configurations of machines, it may be necessary to modify the basic hand and arm position.

   B. The student should then determine his position in relation to the rest of the machine by following the table or other part which permits safe orientation to the machine regardless of its state of motion.

II. Observing the state of rest or motion of the machine.

   A. With both hands on the table or other safe part, the student is usually able to detect when a machine is in motion by the vibrations.

   B. With the power to the machine turned on, the instructor should start and stop the machine several times. Each time the machine starts and stops, the student should detect this by changes in sound and vibration.

   C. When power is off but the machine is still coasting, there may be little detectable noise or vibration. Also, other machines or outside noise may mask or interfere with reception from the machine being operated. The state of rest or motion in this case may have to be determined by touching the end of a shaft (lathe), chuck (drill press), or other moving part. It is recommended that this be done with a piece of scrap stock when the only edge available, is a cutting edge. In the case of machines such as the band-saw or jointer, this becomes an absolute necessity.

*Steps two through four adapted from *Instructional Guide for Use in Vocational Schools Providing Training for Blind Persons*, by J. Hiram Chappell. Rehabilitation Service Series No. 110, U.S. Office of Vocational Rehabilitation, 1950 (Revised 1960).

D. When determining the state of rest or motion, the instructor should guide the student's hand from the initial point of contact to the determining point. Prior to the examination of any other portion of the machine, the student should determine the state of rest or motion.

III. Following paths from the initial point of contact to control points and observation of the progress of the work.

A. Safe paths to follow should be determined when the machine is not in motion.

B. Switches, levers, and all controls can be located by following from the initial point of contact along the edge of the work table until a familiar spot or part is reached and then following it to the desired control.

C. The instructor should guide the hand of the student, by the wrist, from the initial point of contact along a safe path to and from the desired point of control.

D. Approximate heights such as shoulder and head are helpful in estimating locations; however, the student should not be permitted to reach promiscuously for controls or other objects about the work area.

E. Points of observation of the progress of the work being done by the machine are located by following the same procedure as that for locating controls.

F. Following the paths of safety must definitely become a habit.

IV. Observing the progress of the work being done by the machine by sound, feel, and touch.

A. The instructor should demonstrate the progress of the work being done by the machine by performing a work process which the student can observe by:

1. Sound, such as that of a hack saw cutting a steel rod. This is a sound that constantly changes as the cut is being made. Several complete operations should be performed so the student may observe the changes in sound as the cut progresses.

2. Feel, such as the resistance exerted on the feed lever of a drill press which decreases as the point of the drill breaks through the material. A complete operation should be performed so the student may place his hand on the hand of the instructor and observe the change in resistance offered by the feed lever.

3. Touch, such as observing the position of the feed wheel or the changing position of a previously identified part as it approaches a stop or completes its travel in a given direction. A complete operation should be performed so the instructor may place the hand of the student on the feed wheel or moving part to identify the progress of the work being done by the machine.

WOODWORKING

For many years this area has been the backbone of the industrial arts program, because it provides opportunity for the introduction of basic processes and the use of a variety of hand and machine tools. The knowledge and aptitude gained in these experiences provide a basis for further learning in other industrial arts areas.

Two of the special contributions that this area can make are the development of basic skills needed in the area of home repair, and the gaining of a certain sensitivity perhaps best described as "machine sense," which may prove of utmost importance in future employment situations. The following machines are recommended for placement in the woodworking classroom: drill press, disc sander, belt sander, planer, jointer, scroll-saw (with pointer), lathe (with duplicator), band-saw (with pointer), woodwelder, and grinder (edge tool).

A few of these machines require special attachments to insure safe operation. The band-saw and scroll-saw require a combination of protective devices and guides.

The drill press is a machine with which EMRVH students have experienced a good deal of success. The following lesson on the operation of the drill press as presented to a totally blind mentally retarded student illustrates how the EMRVH student can be taught to use the drill press safely and effectively.

This lesson assumes that as a result of previous instruction, the student is able to approach and make contact with the drill press. Step I-A of the four-step pattern of safety mentioned earlier should be used with one modification. The forearm across the body should be positioned to prevent the student from accidentally making contact with the head of the drill press.

First, make sure the power to the machine is turned off. Then follow the steps of the four-step safety plan.

Once initial contact is made, the instruction proceeds as follows:

1. The student determines his relative position to machine by following motor vibrations.

2. The student determines state of rest or motion by touching predetermined point.

   A. He uses his left hand only to touch chuck (Safety Step II-C). Be sure that the machine is at rest before proceeding.

   B. Show the location of various handles and switches. There should be little concern with the name of the parts at this time; however, repetition breeds familiarity.

3. Allow the student to examine the machine freely. He should investigate by himself as many of the following items as possible: height, width, depth, stability, switches, levers.

4. Explain *one* purpose of the machine (drilling a hole).

5. Examine results of finished operations (hole). A split block model of a hole will give the student a better understanding of what a hole is.

6. Examine the machine with the student.

7. Place the student's hand on the part to be examined. Control the student's hand by holding his wrist. He can then explore the finer details since his fingers are free to move within the controlled area.

8. Do not burden the student with excessive details. As the student becomes more familiar with the machine the finer details can be explained.

9. Trace the path that the power travels from the switch box or outlet to the control switch, motor, pulley, belt, spindle, chuck, drill, and then to the work.

10. Terms to be introduced are switch, handle, table, twist drill, work (wood, metal, plastic).

11. Using safety steps to show the student how to locate each of the items in Step 10.

12. Place a piece of wood in the vise.

13. Turn on the power at the switch box or outlet.

14. Have the student place his hand on top of yours as you turn on the machine, pull on the handle, drill a hole in the wood, return the handle, and turn off the machine. Allow the student to examine the hole, the wood chips, and the drill. *Caution*: the drill may be hot. The student should experience this heat but it should not startle or injure him. This step illustrates to the student not only the path that he must follow but also helps to increase his self-confidence. Remember this encounter is probably the first of its kind for this student and it is not one that he will quickly forget. Make it a pleasant, safe experience.

15. Explain to the student that you cannot always be there to guide him and that he will need to learn to do this himself.

16. The student should accomplish and understand each of the following steps before proceeding to the next step.

17. Practice turning the machine on and off several times.

18. Practice moving the hand from the switch to the handle and return to the switch.

19. Move hand from switch to handle; pull handle; return handle to original position; move hand back to switch.

20. Same as 19; in addition, turn the switch on.

21. Place a piece of wood in the vise and let the student drill a hole by himself.

It should be obvious that a student may not accomplish all of these steps during his first encounter with the machine. He should be given an opportunity to experience with the instructor all of the first steps during the first encounter. If it is evident that this will not be possible due to insufficient time, then it is better to present the lesson

at a more opportune time. There is much information that the student must be taught before he is capable of operating the drill press safely and efficiently. This includes drill size, changing drills, setting depth gauge, and placing the work in the vise properly. They must be taught step by step in an orderly manner.

It is expected that a sighted student would spend no more than period or so learning how to operate a drill press effectively; the instructor should not be discouraged if it takes the EMRVH student several weeks to attain the same level.

It is desirable that the student use adaptations in his method of operation rather than cumbersome complicating gadgets. The industrial arts teacher who is unacquainted with teaching the blind or EMRVH should not overlook the opportunity of using experienced industrial arts teacher as a consultant when in doubt about the student's capabilities or when developing teaching methods and aids.

METAL WORKING

An understanding of the metal industry must include a knowledge of the cutting, shaping, grinding, and forming processes used by workers in the metal industries. Bench metal experiences may cause the pupil some difficulty, but they should not, for this reason, be eliminated completely from the student's curriculum. However, if any pupil experiences excessive difficulties in this area it may be more profitable to increase his exposure to machine operations.

Operation of metal working machines usually gives the EMRVH pupil more successful experiences than the bench metal areas. Machine operators (not machinists or set-up men) do not require creative ability but must be capable of working quickly, accurately, and methodically. In most cases the EMRVH pupil can be trained to run machines used for production work if a logical step-by-step procedure is followed. It cannot be repeated too often that the student should start with the easiest operation and gradually work toward the more difficult. Both student and instructor must always realize the student's limitations; however, neither should arbitrarily establish skill or production limits. Maturation, experience, and renewed incentive are factors that may often completely change previously conceived notions of production possibilities and efficiency.

It is recommended that the student receive a considerable amount of exposure to the operation, if this is possible, of machines which would be used in mass production. It is imperative that the pupil develop a degree of "machine sense" and build self-confidence as a safe operator, but equally important, he must not become over confident, and thus an unsafe worker.

Most power equipment can be operated safely by the student if proper instruction is given. In some cases, it may be necessary to adapt the machine in some manner. Adapting equipment, however, is actually creating a handicap; it is more profitable if at all possible to adapt the method and properly train the student to perform the task.

POWER MECHANICS

The EMRVH student should develop an understanding of the principles of simple machine (lever, wheel and axle, inclined plane) and how these machines can be combined to vastly increase speed or power output. He should also be introduced to the general subject of performance of work through machine utilization of various power

sources. An investigation into the type and number of machines the student encounters in his daily activities may be beneficial.

Power mechanics experiences include starting, adjusting, and stopping small gas engines; experimenting with magnets and applying the knowledge gained to the construction of small electric motors; and investigation into the development and uses of various power sources. The disassembly, repair, and rebuilding of small gasoline engines, electric motors, and hydraulic jacks is well within the ability of some EMRVH students. In fact, the final examination in one school for sighted mentally retarded pupils, is to completely disassemble, reassemble, start, and adjust to full running power a lawn mower engine while blindfolded.

HOME REPAIRS

Home repairs instruction and training provide experiences which help to make the EMRVH person a contributing and valuable member of the family. Such knowledge and skills may also serve to enhance his self-concept and contribute to financial independence. However, if these experiences are to be made as meaningful as possible, the student's parents must be encouraged to provide opportunities for practical application at home. The home repair area can conveniently be divided into three areas: mechanical, electrical, and plumbing.

Mechanical. Doors (locks, latches, hinges, freeing from bind); windows (glass and glazing, sash cords, storm, screens, shades and blinds, awnings, drapes); stairs (treads, repair); flooring (materials, care, repair); caulking.

Electrical. Safety and safety devices; tools; materials; repair of small appliances; codes; lighting.

Plumbing. Faucets (replacement, repair); drains (cleaning, replacement); shower (cleaning shower head, repair, replacement); water closet (principle, repair); regrouting tile.

ELECTRICITY

Although the study of electricity can be extremely complex, this field has many aspects which should be considered by the EMRVH student. Primary among these are the great importance of electrical energy to industry and the home, and the potential hazards growing out of unsafe practices in the control of electrical circuits. Due to the dangers involved in working with electricity, the pupil must be thoroughly educated about his abilities and responsibilities in this area. He must be taught specifically what he may attempt and what he must under all circumstances leave to qualified electricians to perform. The basics of the industry may well be taught in another room; in fact, it is urged that the science and industrial arts teachers cooperate in planning the instructional program, but all pupils should ordinarily have experiences in the following:

Magnets. Permanent, electro.

Transformation of energy. Static, chemical, photovoltaic, magnetic, motion to electrical.

Elementary measuring. Voltage, resistance, amperage.

Preparation for home repair activities. Replacement and repair (plug, S.P.S.T. switch, duplex outlet, light socket, light bulb, electric doorbell of transformer and battery types); testing (using continuity tester for fuses, light bulbs, circuits); wires (solid, flexible, splicing).

CERAMICS

Manipulation of ceramic materials has the advantage of readily producing tangible results. In effect, ceramics produces immediate results for the student who needs ego support or effective release from possible failure-induced tensions. There are several methods of forming ceramic materials that the EMRVH student is capable of using successfully. Suggestions include: pinch forming, coil forming, slab forming, throwing on the wheel, jiggering, modeling, slip casting, pressing, molding over a form, mold making, metal casting, and glass forming.

Excessive time should not be devoted to developing skills in these areas unless the student exhibits an unusual amount of adeptness.

ORIENTATION AND MOBILITY

Orientation and mobility skills are concerned with a visually handicapped person's ability to know about his environment and to move freely and purposefully as a result of specific techniques attained through instruction and application. Orientation and mobility techniques have been especially devised to help blind persons move safely and comfortably, and are unique to this group.

It is perhaps an artificial and strained distinction that orientation deals with techniques for learning and interacting with the immediate environment, while mobility is the process by which skills are learned for independent movement within the physical environment.

Orientation and mobility techniques open up possibilities for learning, exploration, achievement, and personal independence not available without their development. Since the ability to move about independently and to gain first-hand experiences with his environment are basic to the life-adjustment of a blind person, appropriate training to accomplish these objectives should be provided during the earliest years possible. The more meaningful and integrative the initial orientation is to the environment in terms of training, variety, and quality of experience, the better will be the total development of the individual and his command of the environment.

Orientation and mobility involve more than physical activity. An individual's control of his environment is very dependent upon his freedom to be mobile intellectually and emotionally. All too frequently society and the schools never really provide the opportunity for the blind youngster to have the meaningful experience of contacting and exploring his environment; nor do they provide verbal explanations and reinforcements that are pertinent and necessary at the particular moment of curiosity.

Because special training of teachers of orientation and mobility is a fairly new sequence, it is still in a state of experimentation and change. However, there are definite standards for the training of such specialists, and knowledge and techniques in teaching blind persons these skills is ever increasing. At present the shortage of competent trained orientation and mobility instructors necessitates the use of other types of personnel, usually the special education teacher. However, it is recommended that the special education teacher work closely with an orientation-mobility instructor whenever possible. The orientation-mobility instructor should function as a resource person to the special education teacher and provide direct service when needed.

As the visually handicapped student acquires skill in the basic techniques, and as his travel needs become more complex, he must be provided with instruction at a higher level of skill. It then becomes a direct responsibility of the school to acquire the services of a competent orientation-mobility instructor. It may be possible to share this instructor with several school districts, or to contract for service from public or private agencies which employ orientation-mobility instructors.

The desire to know more about objects and phenomena must be awakened and encouraged in all youth. He must be led to the fullest utilization of the remaining senses, in order to gain many experiences and make meaningful comparisons. This is even more true of those youth who are both visually and mentally handicapped. Too often, they could be neglected unless special effort and plans are made to work with them.

The special teacher who intends to work with EMRVH students should be aware that the same basic techniques must be presented to the individual student in a systematic step-by-step procedure. Only in simple orientation procedures and orientation games can there be an exception to a one-to-one relationship. Each activity must be divided into short sequential experiences. It is the obligation of the special teacher to assure that each experience has meaning, purpose, and interest to the student, as well as being within his level of learning. There must be progression from the simple to the complex, with an increasing demand made of the student to use his senses and motor functions. However, the retarded adolescent may need considerable repetition of material, and may acquire only a limited range of travel. Excessive patience in dealing with slowness and an understanding of a low frustration tolerance are needed by their teacher.

Following are specific steps in teaching various techniques which may be adapted. The training sequence follows that prepared for children of normal intelligence; however, more time and repetition are needed in every phase of the program.

USE OF SIGHTED GUIDE

A sighted guide provides a mode of travel for the visually handicapped student in familiar and unfamiliar areas. Utilizing this technique, the teacher should teach the student the relationship of his classroom to other important areas such as the entrances, exits, washrooms, and cafeteria. As the student learns more about the building, he will be able to function more effectively. To facilitate new learning, the student should be permitted to explore tactually various landmarks and points of interest. During the exploratory activity the teacher should provide extensive verbal description.

Grip. Guide and student stand shoulder to shoulder facing the same direction. Student grasps sighted guide's arm, thumb on outside of arm just about elbow, fingers on inside of arm. The grip should be firm but not uncomfortable for either party. Once the grip is learned, the sighted person serving as a guide should, at the time of offering his elbow, make physical contact with the blind person. Contact is usually made with the sighted person touching the student's arm with his elbow or touching the back of the student's hand with the back of his hand.

Position. Guide moves one-half pace forward. Guide and student travel together maintaining position. The guide is able to communicate information about the terrain through body movements. Guide moves and gains normal pace as he feels the student relax. They practice turning corners and making gradual stops and starts. As the student masters the technique, running is suggested where permissible.

Narrow openings. Guide signals by moving elbow of guiding arm toward midline of his back, signaling student to move directly behind him and simultaneously to extend his arm to avoid stepping on heels of guide.

Congested area. Same as for "narrow openings" except that student does not extend arm fully, thus staying closer to guide and taking shorter steps.

Doors. Student drops one pace behind when guide opens door. If door is on student's side, student holds it open for both to pass through. If door is on guide's side, student momentarily grasps guide's arm with his opposite hand, moves behind guide, and extends his other arm so that he may hold door open. If door is not self-closing, student closes it.

Seating. Guide places student's hand on back of chair and tells him which way chair is facing; allows student to seat himself. If chair is at a table, the guide places student's other hand on edge of table. If approaching a bench or a piece of furniture without a back or arms, the student is guided into a position so some portion of his body, preferably the legs, comes into contact with the edge of furniture.

Curbs. Any ascent or descent is always approached so the guide arrives first; the guide should be particularly aware of curved ascents and descents.

Interference. Student moves directly behind guide (without receiving a verbal signal) as explained in "narrow openings." This may be used in areas of unusual noises, congestion, or areas in which the student may feel apprehensive.

Stairs. Stairs should be approached so guide arrives first and places the student's free hand in contact with the railing as an added guide. This alerts him to platforms and the first and last steps. Here the value of the "one-half pace behind" rule is realized. Through natural body movements, the guide is able to communicate the ascent or descent to the student. Student stays one tread behind on ascending and descending stairs.

"Hines break." This method is for breaking hold of sighted person offering aid. If the student wishes to use aid, he relaxes his arm when sighted person grasps arm to assist, and moves this arm forward and across his body, away from sighted person. He then uses the other hand to grasp the sighted person's wrist and removes his hand from student's arm. The student's free hand moves to grasp sighted person's elbow and the student makes a statement, such as, "May I hold your arm? This way is more comfortable."

If the student wishes to refuse aid, he uses the same procedure as above, stating, "No, thank you, I'm waiting for someone," or whatever is appropriate for the situation.

Exceptions to original position. For conversational purposes it may be better to walk side by side in environments permitting this. For boy friend, girl friend, or husband-wife situations, the usual walking positions are acceptable when appropriate.

Open space. The student should never be left in open space. He should always be placed in contact with a stationary object, such as a counter or a wall.

Educating sighted guide. It is both desirable and advisable for students to instruct companions in sighted guide techniques.

Familiarization. The teacher, using the sighted guide technique, should familiarize student with areas of immediate importance, Emphasis should be placed on assisting the student to understand his surroundings. For example, he should know

the location of the nearest rest room and water fountain. Other significant places may include constants such as home rooms, lockers, stairways, and the cafeteria. It is well to remember that the sighted guide should make precise moves. For example, the student will have a better concept of intersecting corridors if the guide makes a definite 90-degree turn. It is beneficial to begin this familiarization prior to the start of the school semester and to continue as long as instruction is needed.

General comments. The EMRVH student should be alert at all times and maintain his own orientation, i.e., know the direction in which he is traveling. If he becomes disoriented, he should ask the sighted guide for his position in relationship to the starting point. The EMRVH pupil should also be trained to direct a sighted guide when necessary, for instance, by giving directions concerning a familiar route to a destination.

USE OF FOREARM ACROSS THE BODY

The teacher should assume that the student has no knowledge in orientation and mobility. For example, it is advisable to ask the student to point to his right or left forearm before expecting him to place it in the across-the-body position.

The forearm and the upper arm are held parallel to the floor. The forearm forms an obtuse angle with the upper arm. The elbow protects one side of the body (protection is across the body at the elevation of the arm) and fingertips protect opposite side of the body. The fingers are to be extended but relaxed and the palm should face in the direction one is traveling. EMRVH youth react favorably to the term "bumper" as the name for this technique. To help the student attain the proper position, have him place his body against a solid object such as a wall. Practice moving "bumper" to the proper position and repeat until he can assume this position easily and correctly. Practice in familiar areas until the student can use either arm.

USE OF OTHER HAND AND ARM FOR LOWER OBJECTS

The arm is fully extended downward in diagonal position and the hand positioned below waist in midline of body. The hand is held forward of the body, at a distance sufficient to contact objects in time to allow a safe halt or withdrawal. The palm faces the individual and fingers point downward and are relaxed.

MODIFICATION OF FOREARM ACROSS THE BODY

To retrieve dropped objects. Pinpoint sound (turn head toward sound for purpose of locating source). Assume forearm-across-the body position, then lower upper arm so that it rests against side of rib cage. Position hand in front of face, palm outward. Move one foot one-half step back, bend knees—not waist—for more protection. Lower arm as in basic position. Squat. Place lower hand on probable location of object. Searching hand begins to make a small circle. Gradually widen circle until the circumference reaches the extent of the person's reach. If object is not located, change position to right or left. Make sure each new circle overlaps previous one.

To shake hands with another blind person. Blind persons face each other. Raise right hand and forearm to waist level. Palm of hand should be on or near left

hip. Extend hand and forearm forward, contacting hand or forearm of other person.

To shake hands with a sighted person. Hand is raised and moved slightly forward. Hold hand in midair for sighted person's grasping handshake.

TRAILING

This technique is to be used in familiar environments for one or more of the following reasons: (1) to obtain a parallel line of travel; (2) to determine one's place in space; (3) to locate specific objectives. It also provides greater knowledge of the environment. Trailing is usually done with the right hand and arm, but it should be learned with either hand and arm. The trailing technique may be used in conjunction with the forearm-across-the-body technique. The procedure is as follows:

Student stands with right side near wall. Hand is raised and arm extended so that hand is forward of hip. Back of little finger and ring finger of trailing hand are placed lightly against wall. Fingers point downward and slightly to rear. The distance of trailing hand from body is generally determined by reason for trailing. Should a particular area be used frequently, it is not necessary to trail constantly, but only enough to be aware of location.

SQUARING OFF

Squaring off provides the student with a technique for establishing a definite position in the environment. For example, the direction of the pieces of furniture in a room is determined by the direction the student is facing as he enters the room. However, if he squares off in the doorway by aligning himself with the doorjambs, each item in the room will be in a known relative position. After the student squares off, he is able to direct his travel toward a specific objective.

DIRECTION-TAKING

Direction-taking is the act of getting a line or course from a fixed object or sound to facilitate traveling in a straight line toward an objective; it is best accomplished by using the following procedures:

Establish a success pattern--begin with short distances. Use forearm-across-they-body and hand-and-arm-for-lower-objects techniques. To minimize veering, use a widened stance--toes point forward; lean forward on balls of feet; exaggerate the first step; proceed with normal gait. With proficiency, increase distance. With practice, the student should be able to stop approximately one foot from objective. Reach for objective with back of hand.

The successful completion of these units provides the student with the basic skills of self-travel in familiar areas.

ORIENTATION WITH OTHERS

Familiarization at an advanced level of training is more complex than the familiarization initially described. The particular environs and student capabilities and needs determine the extent of orientation that is necessary.

The student may need to know that normally pedestrian traffic keeps to the right; that he may travel against such traffic for short distances if it facilitates reaching an objective.

In orienting a student to a room, for example, the teacher begins at the doorway and walks the student around the perimeter of the room, pointing out all significant objects in the room; encouraging the student to explore tactually the objects to his satisfaction; and after returning to the doorway, having the student point to various objects in the room. Naturally review is often necessary.

The student should next be familiarized with objects or items not along the perimeter of the room. The relationship of objects to each other, the doorway, and to specific landmarks along the perimeter should be established.

The student's ultimate goal is to be able to move from any one point to any other point. To develop this ability, the teacher should ask him to go from place to place in the room using as direct a route as possible. A good route with utilization of proper techniques should work every time attempted.

SELF-ORIENTATION

The student is expected to apply familiarization procedures independently. This procedure duplicates the familiarization steps he had followed with the teacher. The teacher should provide necessary assistance and also necessary reinforcement until the student successfully completes a phase of the process. Ultimately through independent exploration and experimental trips, the student should be able to develop a mental image of the room and demonstrate his understanding through ability to function efficiently and effectively within the environs.

TESTING OUT SKILLS

At this point the student should have learned the basic techniques that enable him to move safely, efficiently, and confidently. A success pattern has begun to develop. Now the learned techniques can become really meaningful to the student.

To increase confidence and insure a success pattern the initial routes should be simple ones. Security and understanding will continue to develop as the student is required to complete the return trip. It should be remembered that the student who is capable of returning is more apt to accept the initial challenge of going.

The student is familiarized with a route by the teacher using the sighted guide technique. The student may use the trailing technique where firsthand information is required. After practicing with the guide, the student is then asked to find the objective himself and return. It is often advisable to require the student to state how he would go about finding his objective.

In evaluating performance, the child's ability in the following areas should be checked: (1) awareness of and use of clues (change in terrain and air currents; significance of odors and temperature changes; utilization of sound reflections); (2) ability to seek out dominant clue; (3) ability to remain oriented (proper squaring off and direction-taking, good trailing habits, proper use and control of guide, ability to remember routes, turns, distances, and ability to follow verbal instructions).

PHYSICAL EDUCATION

The basic goal of a physical education program is the utilization of physical activity as a medium to help the individual progress to higher levels of general functioning in accordance with his potentialities. Good health, vitality, energetic readiness for action, energy reserve against emergencies, a sufficiency of physical skills for work and play, unique physical and athletic achievements, enthusiasm for physical pursuits, competitive spirit, sportsmanship, self-discipline, tolerance and leadership are but some of the particular outcomes of any good physical education program.

The activities of the gymnasium and playing field encapsulate the personal, social, and cultural conditions of life. In this comparatively permissive atmosphere, the young person learns to take some responsibility for self-restraint; to understand that his actions must be governed to the extent that they are generally agreeable to others, and to lead or to follow.

It is well for the physical educator to bear in mind the factual learning that can be attached to fun-oriented activities: the facts of nutrition, health practices, textures and materials, and how things are put together. Listening and verbal skills can be reinforced; arithmetic can be used. Duties such as maintenance of balls and equipment, and attention to building cleanliness, to minor equipment repairs, and to laundry responsibilities can be excellent teaching devices to acquaint these young people with the procedures, materials, and implements of work. Skills are not to be taken as progressive accomplishments to be taught in successive order. They are merely the fundamental repertory of abilities that any child needs in order to engage vigorously and pleasurably in a diversity of physical activities.

Acquisition of basic participation skills falls into two basic categories: contraction and extension movements including bending, stooping, twisting, and stretching; and activity movements including running, jumping, changing direction, throwing, catching, hopping, skipping, kicking, pushing, pulling, balancing, and lifting. Physical fitness describes a general state of physical and physiological readiness for engagement in play, sports, recreation, and daily living, without overtaxing muscles, body systems, and energy reserves.

The development of physical fitness includes the following objectives: endurance, strength, flexibility, agility, coordination, and physique. The instructor can assess and measure fitness assessments and measurements generally and specifically by (1) comparing the norms of physical development, allowing for physical or mental deviations; (2) achievement activities such as those which test repetition and resistance; (3) testing abilities in running, pulling, pushing, and jumping, and (4) examining motivations of the participant for improvement of physical powers, for adult and peer approval, and for enjoyable athletic participation.

Development of body control includes those activities dealing with the whole body and those concentrating on specific parts of the body. Activities need to be

developed which deal with sophisticated wrestling and tumbling skills; skilled game patterns (batting, kicking, intercepting, shifting, reversing); and complex movement activities (advanced gymnastics, total game participation in complicated and competitive activities).

Instruction in swimming skills should be an integral part of the physical education program. The best teaching results are obtained in a one-to-one relationship. Because of the complex coordinations that swimming demands, achievement is sometimes quite slow, and levels of competence are reached less frequently here than in other areas. In all the aspects of orientation, introduction, and instruction in and around water, the factor of safety is stressed. It must be emphasized that though an individual may cease to show progress, instruction should be maintained so the skills gained do not retrogress.

In considering a program for EMRVH adolescents, some specific details must be kept in mind. Mental retardation may be accompanied by such physical insufficiencies as poor muscle tone, limited body mechanics, a low level of fitness, and tendencies to lassitude. Blindness, in proportion to its severity, may limit a child's willingness or ability to engage in the physical action, explorations, and vigorous play of childhood. When both handicapping conditions occur in the same child, they may impose upon him an immobility which denies him the physical, personal, and social growths that derive from engaging in, and sharing with others, a diversity of physical pursuits.

A broad spectrum of opportunities should be provided to enable each child to achieve the maximum benefits inherent in individual and group physical expression. Initially, however, the physical educator must aim for more immediate and fundamental results--especially for those students who are entering adolescence with little or no previous directed physical learning. He must counteract deficiencies of motor performance; poor spatial orientation; abnormal fear of movement or a dangerous lack of caution; impoverished and/or distorted concepts of self; excessive withdrawal or overagressive tendencies; and a poverty of the behavioral traits and understandings needed to engage in activities which demand organization and group participation.

Each child must be dealt with according to his current capacities for involvement. The process of assessing what these capacities should include--indeed, must include--specific clinical information that may dictate the direction or limitations of the child's physical experiences. Does he suffer cardiovascular, respiratory, neurological, or other systemic malfunctions? Does he have seizures? Is his visual loss the result of retinal detachment, glaucoma, or other eye disease that may result in further visual deterioration during stressful or violent physical action? What are the psychological or psychiatric findings that may be pertinent to the choice of the child's activities? No physical education program for these children can be intelligently initiated without access to such professionally ascertained information. From this point, however, the capable physical educator can usually rely upon his customary techniques of evaluating a child's present level and successive progression of functioning.

The primary goals are to determine the child's capacities and then provide for the attainment of progressively higher accomplishment levels. When youngsters exhibit serious physical ineptitudes, they should be started in activities chosen to counteract their poverty of body mechanics and basic play skills. The majority, though, will be capable at once of beginning a broadly diversified program.

The word involvement expresses the theme of the program presented here. Instructors will find it necessary to exercise inventiveness and imagination to devise and adapt activities to provide fun, appeal, and physical challenge for these young people. In so doing, he should give consideration to the normal precautions and safeguards that apply in any physical education program; but he also should remember that all children suffer minor hurts, bruises, and abrasions. These are normal. No instruction should be persuaded by such occurrences to fall into the common erroneous practice of overprotecting these children. The major dangers must be anticipated and avoided, but the minor hurts are a part of childhood.

In the first stages of directed physical experiences, an educable mentally retarded visually handicapped young person can gain much confidence and security from concepts so basic that they are sometimes overlooked in his initial instruction. The child's familiarity with the areas where he will perform should be an immediate matter of individual direct teaching. Sufficient time should be devoted to a step-by-step procedure so that he will learn to traverse areas, avoid hazards, locate appropriate doorways, and negotiate passageways. At first he may need help in dressing for gym activities. This individual instruction can do much toward establishing rapport.

Enhancement of individual ability for the blind means learning through active play, the use of environmental orientation cues such as fixed sounds, surface contours, alterations in surface texture, relative positions of classmates. For the partially seeing child, individual ability is acquired through practice and participation of improved eye-hand coordination; improved spatial judgment; awareness of effects of intensities and directions of light on personal visual efficiency; improved attention to moving objects. The child whose loss of sight occurred at an early age and the congenitally blind child may, even in adolescence, need direct teaching to master the complex muscle coordinations involved in running, throwing, skipping, kicking, and other skills. These basic abilities derive from and develop through appropriately selected activities. Extensive verbalization is of little value. The actions speak for themselves.

This applies to EMRVH precisely as it does to all other children. It does demand for many of these children, however, a much longer time for attainment and greater and more direct involvement in specific fitness-imparting exercises and activities.

In all physical education programs for EMRVH adolescents, there must be some adaptation of activities. These will tax the creativity of the teachers. It is suggested that a regular program be perused with the question ever present—can these be followed as is? If not, what minor changes are needed?

SCIENCE

The lives of all persons are affected, in one form or another, by the plant, animal, and inanimate world in which they live. Teaching of science, then, centers about three basic considerations: (1) explaining how the natural world works; (2) offering a basis for understanding (and conversation about) those aspects of science within the pupil's everyday life; and (3) education about the need for conservation of natural resources.

The educable mentally retarded visually handicapped youngster may well have a larger stake in understanding the natural world than the average person because he is more likely to engage in services and occupations that are out of doors. This does not mean, of course, that the EMRVH youngster must understand all about technology and space exploits (after all, most persons do not), but rather that he should have as clear an understanding as possible about plants, animals, and minerals in the world around him.

There is a strong movement in science teaching toward the conceptual scheme approach. For the EMRVH pupil, however, the better method is the more concrete plant-animal-physical matter-energy-space method, allowing, of course, for the special tactile and repetitive adaptations required by these pupils.

The following outline is not very different from that once presented to the average pupil; it must, however, be adapted for the visually handicapped mentally retarded. It is divided into five basic sections, ranging from the concrete to the abstract.

Animals. Care (essential needs, pets, commercial—pet hospital, boarding kennel); usefulness (food, clothing, transportation, companionship, protection); behavior toward strange animals; discomforts and dangers (diseases of animals, and human diseases and discomforts resulting from animals and insects); protective measures (clothing, repellents, destruction of breeding places, etc.).

Plants. Essential needs and care; home plants (indoor and outdoor); commercial (greenhouse and landscape gardening); special treatment (trimming, pruning, training, environmental changes); useful plants (food, shelter, clothing, medicine, shade, ornamentation, etc.); harmful plants (irritating, poisonous, addictive, eradication and avoidance of such plants); conservation of plant resources.

Earth. General features (size, shape, composition); specific surface features (continents, islands, peninsulas, plains, deserts, mountains, oceans, seas, lakes, rivers, streams, volcanoes, geysers, earthquakes, etc.); weather (seasonal and daily variations, temperature, breezes, winds, hurricanes, tornadoes, clouds, fog, mist, rain, snow); climate (types and causes); effects of weather and climate variations.

Machines and power. Simple and complex types and uses in the home, office, and industrial plant; care (lubrication, protection from harmful matter, overheating, overloading, etc.); maintenance and repair; types and uses of power (steam, electrical internal combustion, atomic, etc.); effects of development of machines and new power sources on patterns of living, transportation, job opportunities, and leisure pursuits.

Space. Sun, other stars, planets, moon (appearance, size, distance, composition, importance to life on earth); space exploration (importance, application to daily life, and famous astronauts).

SOCIAL STUDIES

The social studies sequence is designed to help pupils acquire knowledge and skills essential for good citizenship, as well as attitudes that lead to sound democratic behavior. It seeks to develop in each student an appreciation of the American heritage, the democratic way of life, and the moral and spiritual values inherent in our society. A balanced emphasis is placed on the common good and the individual good and on the rights and responsibilities of each person to contribute to society to the best of his ability.

The pupil's attitudinal development involves the gathering of knowledge from many facets of the present and the past, so that he can see how men have worked together in personal, social, business, and governmental relationships for the mutual good and benefit of all. History, geography, the growth of business and industry, cultural and scientific attainments, knowledge of our own and other peoples, and understanding of our own and other forms of government, all contribute to the development of an individual who can reasonable meet societal demands.

Important as this knowledge is, it only provides background material for individual decision-making and action. Every possible provision must be made for children to have personal experience in (1) small-group self-governing procedures and in the larger social, economic, humanitarian, and political concerns of the school, city, borough, county, state, and nation; (2) accepting and carrying out the responsibilities of a business enterprise; and (3) appreciating the art, culture, and peoples of his own and other countries. Learning must come from actual participation (visits, discussion, decision-making, buying, caring for, selling at a profit or loss, agreeing and disagreeing). At the same time the child should be learning the limitations of personal freedom of action, due regard for the rights of others, and the satisfactions of individual and group effort.

Acquisition of these characteristics is not something that can be accomplished quickly by a pupil. The beginnings lie in the earliest years, in the give and take of family relationships. This, of course, is true also of the EMRVH child. Unfortunately, experience has shown that under the ·ress of multiple handicaps in a child, family relationships may be strained, even abnormal, and the task of acquiring good skills and attitudes is complex.

If EMRVH youth are to meet their responsibilities as participants in our democractic society, it is reasonable to provide them with the basic information that will make their understanding of current events as adequate as possible. There is certain historical knowledge that is naturally expected of all individuals, sighted or visually handicapped, normally intelligent or retarded. Ignorance of such easily learned events (Columbus, the early trials of the settlers, Thanksgiving, etc.) immediately isolates an individual in an unfavorable manner, and every effort should be made to avoid such occurrences.

The EMRVH individual should be so educated and trained that he is able to live harmoniously with his associates; give due regard to the rights of all peoples;

exercise his voice judiciously in public and at the poll; abide by laws; give heed to the mores and customs of his community; pay his bills, maintain himself in reasonable health; and in his own way contribute if possible to the comfort, enjoyment, and well being of others.

It is hoped that the beginning of this training will take place in relation to the home and family life, and then develop outward to include the wider circles of school, neighborhood, local community, city, state, nation, and the world.

A standard social studies curriculum, beginning with the school, the local community, and moving finally to the whole world, may be followed with these youth. Emphasis should be on providing EMRVH children with basic information for their functioning as citizens and for use in everyday relationships and conversation.

Provision should be made for boys and girls to participate with others in ways that should help them develop through practice the concepts and skills required for desirable and successful social adjustment.

It should be stated again, however, that all these goals may not be reached by certain EMRVH youth and that the concepts will have to be taught at levels and paces different from those of the normal student.