

DOCUMENT RESUME

ED 070 072

24

CS 000 289

AUTHOR Otto, Wayne; And Others
 TITLE Wisconsin Design for Reading Skill Development: Rationale and Objectives for the Study Skills Element. Working Paper No. 84.
 INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Cognitive Learning.
 SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
 REPORT NO WRDCCL-WP-84
 BUREAU NO BR-5-0216
 PUB DATE Feb 72
 CONTRACT OEC-5-10-154
 NOTE 106p.; Report on the Wisconsin Design for Reading Skill Development, from the Reading and Related Language Arts Project

EDRS PRICE MF-\$0.65 HC-\$6.58
 DESCRIPTORS *Behavioral Objectives; Elementary Grades; Integrated Curriculum; *Language Arts; Map Skills; *Reading; Reading Materials; *Reading Skills; Social Studies; *Study Skills

ABSTRACT

Essential skills and objectives for the Study Skills element of the "Wisconsin Design for Reading Skill Development" are presented. Three major subareas--maps, graphs, and reference--and several substrands for each are identified. Sources consulted and a rationale for choosing specific skills are given. (Author)

ED U/0012

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIG-
INATING IT. POINTS OF VIEW OR OPIN-
IONS STATED DO NOT NECESSARILY
REPRESENT OFFICIAL OFFICE OF EDU-
CATION POSITION OR POLICY

Working Paper No. 84

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT:
RATIONALE AND OBJECTIVES FOR THE STUDY SKILLS ELEMENT

Wayne Otto, Karlyn Kamm, and Evelyn Weible

Report on the Wisconsin Design for Reading Skill
Development, from the Reading and Related
Language Arts Project
Wayne Otto, Principal Investigator

Wisconsin Research and Development
Center for Cognitive Learning
The University of Wisconsin
Madison, Wisconsin

February 1972

Published by the Wisconsin Research and Development Center for Cognitive Learning, supported in part as a research and development center by funds from the United States Office of Education, Department of Health, Education, and welfare. The opinions expressed herein do not necessarily reflect the position or policy of the Office of Education and no official endorsement by the Office of Education should be inferred.

Center No. C-03 / Contract OE 5-10-154

STATEMENT OF FOCUS

The Wisconsin Research and Development Center for Cognitive Learning focuses on contributing to a better understanding of cognitive learning by children and youth and to the improvement of related educational practices. The strategy for research and development is comprehensive. It includes basic research to generate new knowledge about the conditions and processes of learning and about the processes of instruction, and the subsequent development of research-based instructional materials, many of which are designed for use by teachers and others for use by students. These materials are tested and refined in school settings. Throughout these operations behavioral scientists, curriculum experts, academic scholars, and school people interact, insuring that the results of Center activities are based soundly on knowledge of subject matter and cognitive learning and that they are applied to the improvement of educational practice.

This working paper is from the Wisconsin Design for Reading Skill Development element of the Reading and Related Language Arts Project, in Program 2, Processes and Programs of Instruction. General objectives of the program are to develop curriculum materials for elementary and preschool children, to develop related instructional procedures, and to test and refine the instructional programs incorporating the curriculum materials and instructional procedures. This element has two general objectives: to develop and refine the Wisconsin Design for Reading Skill Development, Grades K-6; and to conduct exploratory research, the results of which will be incorporated into the Wisconsin Design for Reading Skill Development. The Wisconsin Design represents a systematic attempt to (1) state explicitly an array of reading skills that, by long-standing consensus, are essential for competence in reading, (2) assess by means of criterion-referenced tests, individual pupils' skill development status with respect to explicitly stated behaviors related to each skill, (3) provide a comprehensive management system to guide grouping for, and planning of, skill development instruction, and (4) monitor each pupil's progress in the development of specific skills. The comprehensive objective is to provide school personnel with prototypes of the essential components of an individually guided reading skill development program for the entire elementary school.

ACKNOWLEDGMENTS

We owe a debt of gratitude to four people who reviewed the semi-final version of the list of study skills and objectives:

Dr. Barbara Bartz, Staff Consultant in Research and Design, Field Enterprises Educational Corporation

Dr. John E. Helfrich

Dr. Anthony Manzo, Assistant Professor, University of Missouri, Kansas City

Mrs. Gloria Anderson Waity

Their perceptive comments were invaluable. Any omissions or limitations are, of course, the responsibility of the writers.

TABLE OF CONTENTS

	Page
List of Tables & Figures	vii
Abstract	ix
I. Introduction	1
II. Overview of the Revised Study Skills Objectives	5
III. Rationale for Choosing Skills	7
Maps	7
Graphs and Tables	12
Reference	16
References	30
Appendices	
A Maps: Additional Sources Consulted	35
B Maps: Social Studies Textbooks Consulted	39
C Graphs: Additional Sources Consulted	47
D Reference: Additional Sources Consulted	53
E Outline of Study Skills	55
F Study Skills Objectives	63

LIST OF TABLES AND FIGURES

Tables

1	Skill Levels by Area and Grade	1
2	Number of Skills by Subarea, Assessment Procedure, and Level	6
3	Alphabetizing Skill Compared by Definition and Grade Placement	21

Figures

1	Strands and Divisions Within the Subarea of Maps	11
2	Strands and Divisions Within the Subarea of Graphs and Tables	15
3	Strands and Divisions Within the Subarea of Reference	27

ABSTRACT

Essential skills and objectives for the Study Skills element of the Wisconsin Design for Reading Skill Development are presented. Three major subareas--maps, graphs, and reference--and several substrands for each are identified. Sources consulted and a rationale for choosing specific skills are given.

I

INTRODUCTION

The Wisconsin Design for Reading Skill Development has one general objective: to expedite individually guided education in reading skill development at the elementary school level (Otto and Askov, 1970). Six skill areas were identified and, in our early work, the skills were clustered at five levels that correspond generally to traditional grade levels. The six skill areas and approximate grade level equivalents of the five skill levels are shown in Table 1.

Table 1
Skill Levels by Area and Grade

Skill Area	Grade				
	K	1	2	3	4-6
Word Attack	A	B	C	D	---
Comprehension	A	B	C	D	E
Study Skills	A	B	C	D	E
Self-Directed Reading	A	B	C	D	E
Interpretive Reading	A	B	C	D	E
Creative Reading	A	B	C	D	E

Word Attack skills are not given beyond Level D because the essentials are, or ought to be, introduced and taught by the end of the primary grades. The remaining skills are clustered at Level E for grades 4-6 because traditionally the middle grades have been the place for consolidating and refining reading skills.

The intent in clustering the skills in each area by level is not to endorse or perpetuate an approach to skill development that is tied to grade levels or children's chronological age--such an approach would be incompatible with the facts of human development and the intent of the Wisconsin Design. The skills are clustered for two reasons: to facilitate implementation of the Design and to encourage the sequential development of skills. In our experience, at the time of initial implementation many schools are organized on a traditional grade level basis. The break-in process is easier, as explained elsewhere (Otto and Askov, 1970), if levels are pegged by grades. Of course there is no need to continue the grade-by-skill-level overlap beyond the break-in. The levels of skills are arranged in sequence, but the skills within a given level are not necessarily arranged in a hierarchical sequence. Thus, skill development groups can readily be formed within a level. The levels simply help bring together a pool of pupils for skill grouping. In a sense, the levels serve a rough focusing function that precedes fine focusing on a specific skill.

The Design has the following components: a list of essential skills for each area; a specific behavioral objective for each skill

in the Word Attack, Comprehension and Study Skills areas and open objectives for the remaining areas; criterion-referenced tests or informal assessments for each behavioral objective; pupil profile cards to implement the systematic grouping and regrouping of pupils according to skill development needs; and resource files of materials and procedures for teaching specific skills. The Design provides a skill development framework for an elementary school reading program, a means for monitoring individuals' progress in skill development, and a management system for both pupils and instructional materials and procedures; these are compatible with but not tied to any particular instructional setup (e.g., basal reader centered, classic individualized or language experience).

II

OVERVIEW OF THE REVISED STUDY SKILLS AND OBJECTIVES

The present list of skills and behavioral objectives for the Study Skills area is the result of extensive revisions of an earlier list. The revision is based upon a search that was undertaken to seek whatever consensus might exist in the literature regarding the essential study skills. The previous list was a consensual statement from a single school system; but experience had shown a lack of more general consensus regarding study skills. Details of the literature search and the rationale for certain decisions regarding the revision are presented in the next section of this paper.

Two basic decisions shaped the nature of the revised list. First, it was decided that three strands of subskills would be developed within the Study Skills area: map skills, skills related to graphs and tables, and reference skills. The third subarea, reference skills, is rather broadly conceived to include certain behaviors that are sometimes called "study habits" and certain specialized reading techniques. The second decision was to specify sequential skill development for each of the middle grades. The skill level by grade designations for the Study Skills area are now:

Grade Level	K	1	2	3	4	5	6
Study Skill Level	A	B	C	D	E	F	G

The intent is to develop group-administerable, criterion-referenced tests for most of the skills; but, as in the Word Attack area, certain skills are best assessed through informal observation. In Table 2 the number of skills assessed by formal tests and by informal observation is given for each subarea at each level, and the total number of study skills identified at each level is given.

The outline of study skills and the listing of specific study skills objectives are given in the appendix. In the outline, the number that follows each skill identifies the skill for recordkeeping purposes; when an i follows the number, the skill is assessed informally through observation. The map, graph, and reference skill strands are designated by appropriate symbols in the list of Study Skills objectives so that the reader can readily follow the development of a strand.

Table 2
Number of Skills by Subarea, Assessment Procedure, and Level

Subarea							
	Map Skills		Graphs and Tables		Reference Skills		
Level	Test	Observe	Test	Observe	Test	Observe	Total Skills
A	--	3	--	--	--	6	9
B	4	1	2	--	5	4	16
C	6	1	3	--	5	4	19
D	5	--	4	--	8	8	25
E	4	--	3	--	9	10	26
F	4	--	4	--	7	5	20
G	5	--	3	--	4	5	17

III

RATIONALE FOR CHOOSING SKILLS

A search of the literature was conducted for each of the three subareas identified in the Study Skills area. The professional literature, instructional materials such as textbooks, kits, and workbooks, and standardized tests were examined. Information gained from the search, from consultants, and from school personnel is the basis for the present list of skills. The findings related to each of the three subareas are briefly summarized in the sections that follow.

MAPS

Historically, some instructional emphasis was placed on geography skills in the nineteenth century, but this emphasis declined in the twentieth century until the early 1950s, when the trend shifted back toward an emphasis on map skills. The main reason for the renewed interest appears to be the prominence given to the concept of the changing environment. Whipple and James (1947, p. 205) put it well: "Sounder methods of map instruction are needed if pupils are to develop the flexible knowledge of the relations of places which is necessary today."

In a similar vein, Collier and Vodicka (1960) said,

In the Space Age in which Americans have rather suddenly found themselves it is quite apparent that two major changes have taken place. First the world has shrunk in terms of time required for transportation and communication on a world-wide basis; second, the geographic horizons of every American, even children in the primary grades, are much more broad than they were even ten years ago. [p. 212]

Job and Weiser (1965, p. 6) put it even more emphatically: "Maps and globes are the media via which many of the most basic learnings of the social sciences are transmitted, and no other communication tool is as effective for the purpose. If a child is to develop an understanding of the social world around him, he must begin by understanding the physical world."

Accordingly, in the late 1940s and in the 1950s and 1960s attention was given to the nature of map skills. Jarolimek (1963, pp. 18-19), for example, had map skills, among others, in mind when he said that "[social studies] skills are the most basic tools of learning. . . . Inadequately developed skills foreshorten the opportunity to continue learning and lead inevitably to poor achievement." He went on to state that the skills tend to be fairly complex: "In almost all cases social studies skills are intellectual in nature and call for the use of cognitive processes." A few educators addressed themselves to the problem of how the map skills should be taught and when they should be introduced. The skills discussed generally are related to two major topics, representation and directions.

A critical question regarding representation is whether a pupil needs to initially manipulate concrete objects in order to develop a sense of what a map is. Savage and Bacon (1969, p. 495) feel first graders can learn on an abstract level, and that undue emphasis may be placed on the manipulation of concrete objects. Sabaroff (1959, p. 445) disagrees. She feels that merely matching and naming a symbol is

not the ultimate goal of map reading skills, since a symbol does not stand for a word. "Only when a map symbol calls forth a mental image . . . can he [the pupil] use the map 'shorthand' with any significant meaning." Whipple and James (1947) also took the latter position in pointing out the need for an adequate foundation for map reading:

The pupil who does not realize that many types of landscapes exist lacks the prerequisites for visualizing the terrain depicted on a map. The child who is acquainted with the meaning of simple cartographical terms, such as lake, river, ocean, sea, plateau, and plain, ought first to be familiarized with the forms which they indicate. [P. 206]

Collier and Vodicka (1960, p. 212) also support the latter view. They feel surface features may be observed when pupils take neighborhood trips and that later, in the classroom, blocks may be used to represent objects in the environment and placed in proper relationship to each other. The consensus appears to be that before a child can understand a map, he must be able to envision the reality it represents.

The second question often posed is that of how early the cardinal directions should be introduced. Kohn (1954) suggests an answer:

. . . a sense of direction is not inborn but is learned . . . The process begins with helping children develop the ability to orient themselves . . . in relation to things in their environment. With guidance very young children can begin to express direction in relative terms. . . . Such expressions as "over there" and "that way" will help beginners develop a feeling for direction and a means of expressing it. [P. 147]

Sabaroff (1959, p. 449) expressed the opinion that cardinal directions could be introduced in the first grade as labels only, for the purpose of familiarizing pupils with the terms, and that how directions are determined could be taught later. The implication is that determining

directions is a skill which not only must be taught explicitly, but which must be taught developmentally.

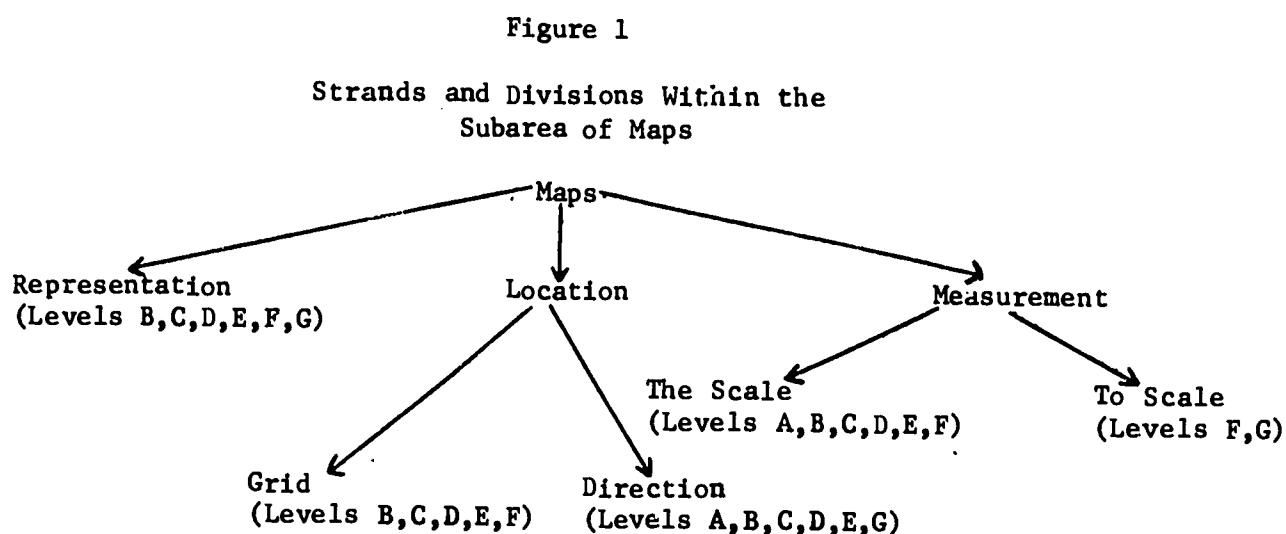
Though the emphasis on map skills has been increasing for the past twenty-five years, little attention has been paid to the creation of an organizational or developmental framework for the skills. Most of the skill outlines that have been devised suggest that there is a vast number of unrelated map skills, rather than that there are only a few fundamental skills, each with a number of related subskills. In addition to overlooking such a developmental framework, existing instructional materials tend to completely ignore important background concepts that a child must understand before undertaking a particular skill. Standardized tests seem to parallel the instructional materials in that they treat the skills as an array of unrelated tools the child should acquire. The skills appear to be selected randomly for assessment.

In general, our survey showed that up to the present time little thought has been given to either the interrelationship existing between the map skills or to the related concepts. Teaching of the skills has been incidental rather than systematic.

In conducting the survey a number of sources were consulted that have not been cited previously. (See "Maps: Additional Sources Consulted," Appendix A.) The information gained from these sources, together with the results of the survey and input from consultants formed the basis for our present list of map skills. We have taken the position that a limited number of fundamental skills run through the subarea of maps at increasing levels of sophistication. In the outline, these basic

skills are introduced at the primary level and serve as building blocks on which more sophisticated variations of the same skills are added. We have made an attempt to deal not only with skills at increasingly more sophisticated levels, but also with the related concepts (see the Teacher's Resource File: Study Skills).

Figure 1 shows the three main strands we have identified in the maps subarea: representation, location, and measurement. A brief discussion of each strand and its divisions follows. For a more detailed description see the Teacher's Resource File: Study Skills.



Within the first strand, representation, two continua exist. The symbols themselves range along a continuum from concrete (e.g., pictures) to abstract (e.g., lines and dots). Likewise, the reality in the environment that is being represented ranges from concrete objects (e.g., a house) to area characteristics (e.g., an urban area). The developmental sequence--from concrete to abstract--is obvious in this strand.

Location has two divisions of skills, grid and direction. The progression in grid is from using a simple picture grid to using latitude and longitude to locate points. The skills in direction range from the use of general terms (e.g., up, over, beside) in the environment and in two-dimensional representations, to the use of cardinal and intermediate directions as applied to the globe, environment, and maps.

Measurement also includes two divisions, "the scale" and "to scale." Skills pertaining to "the scale" range from the use of crude approximation (e.g., long way) to precise computations. Skills pertaining to "to scale" involve the child's understanding of the need for reduction in maps.

There are two assumptions which underlie our fundamental skills and subskills framework: that learning can best be achieved through the study of interrelated skills rather than isolated skills; and that having the skills presented in a developmental sequence facilitates their being taught in context--for example, map skills are an integral part of the social studies program. Creating the need to learn a skill is essential if learning and understanding is to be complete.

GRAPHS AND TABLES

Weintraub (1967, p. 345) pointed out a basic problem with graphs and tables: "Graphs present concepts in a concise manner and give at a glance information which would require a great deal of descriptive writing. They distill a wealth of information into a small amount of space. It is because graphic materials can do this that they are often quite difficult to interpret. Their very strength thus creates a problem." He concluded

that "the ability to read graphs is a skill which must be taught" (p.347).

The critical question in teaching graphic materials is that of what the optimal sequence is for teaching different kinds of graphs. Several viewpoints regarding the relative difficulty of picture, bar, circle, and line graphs are presented in the literature. Perhaps the focal point, however, is not the sequencing of the graphs themselves, but rather the sequencing of the skills involved in interpreting a particular graph. A natural and logical progression of skills begins with a simple, pictorially represented one-to-one correspondence and moves to include a many-to-one correspondence with the various correspondences graphically represented in different ways. (A graph with a one-to-one correspondence would contain the same number of symbols as objects being represented. A many-to-one correspondence would show each symbol standing for more than one object.)

These graph skills are closely tied with arithmetic skills, and in deciding upon a viable progression for an instructional group, care should be taken to see that there is a parallel between the mathematical background of the learners and the graph skills being introduced. For example, a circle graph, though generally thought to be quite sophisticated, could be introduced at the kindergarten level to show simple proportion, i.e., a circle colored 25% green and 75% red, shows "many more red than green."

The content presented also plays a major role in deciding when a graph is appropriate for a given learner. The teacher, in addition to considering the skills necessary for interpretation, should also be sure the child clearly understands the need for using the graph. Weintraub (1967, p. 349) feels that "even though the research evidence may suggest

one particular form as being simpler to interpret than another, the subject matter to be presented in graphic form must often dictate the most suitable graph for ease of interpretation."

The literature pertaining to the actual teaching of graphs emphasizes the need for the child to construct a graph, first as part of a group, and then on his own. Data the children can gather from the classroom or school is ideal for these initial steps. The teaching of tables complements the teaching of graphs, since a set of data is usually first reordered in the form of a table, and later displayed in graphic form.

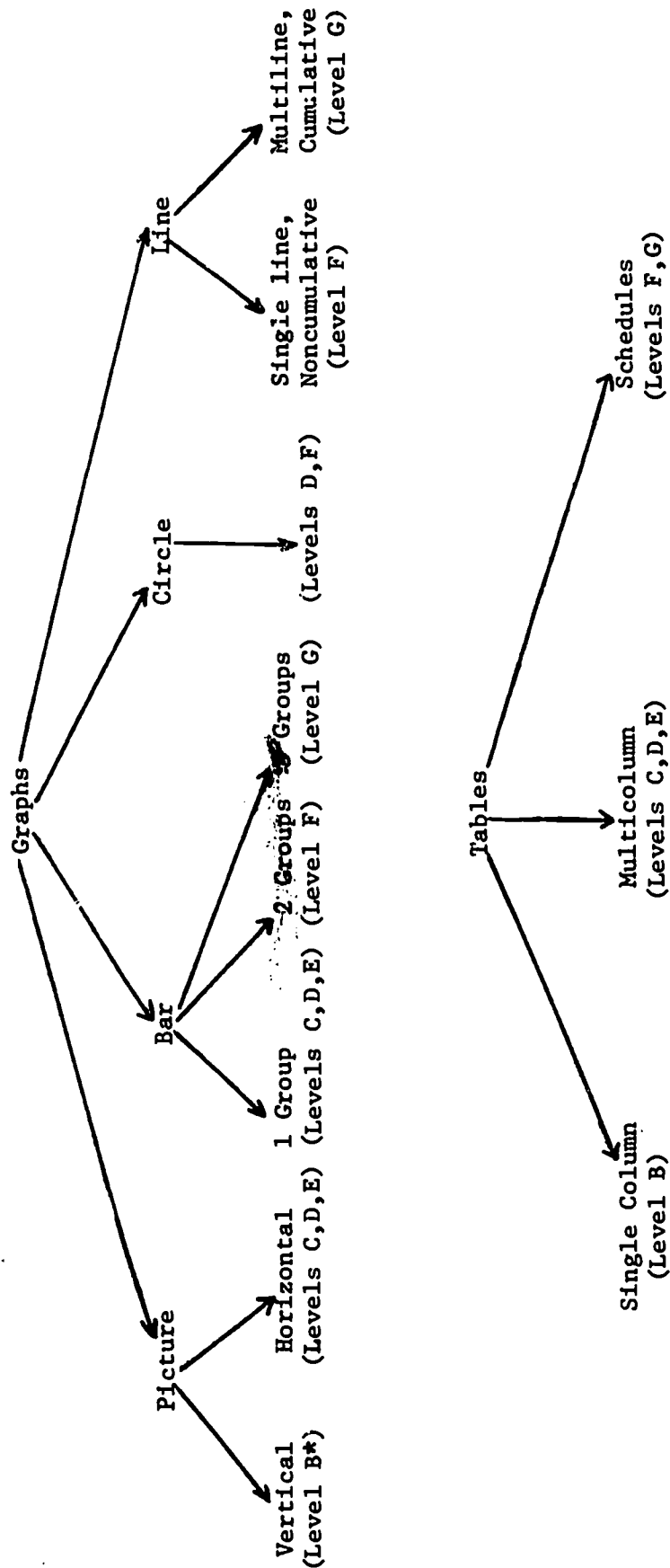
In summary, our survey points out that the developmental progression in graphs and tables should be dictated not by the type of graph or table, but rather by the particular skills necessary to the interpretation of the graph or table. Context seems to determine the appropriateness of the type of graph or table selected.

Our list of graph and table skills follows a developmental progression which begins with a simple, pictorially represented one-to-one correspondence and includes a number of many-to-one correspondences. The picture, bar, circle, and line graphs are introduced at various levels (see Figure 2) primarily to provide the child with practice on a variety of graphs. It is assumed that an appropriate context will be used for teaching each type of graph and the related skills.

Our graph and table outline is based on the information we gained from additional sources but not cited previously (see "Graphs: Additional Sources Consulted," Appendix C), the results of the survey, and input from outside consultants.

Figure 2

Strands and Divisions Within
the Subarea of Graphs and Tables



*Refers to skill level in the Outline of Study Skills

REFERENCE

Within the area of reference skills, the search concentrated on the literature since 1960. This decision was made for two reasons. First, the publication of the 1960 Standards for School Library Programs (American Association of School Librarians, 1960, pp. 24, 25) was an event which has brought great change in thought about school libraries; at the time they were published no school in the country met all the criteria established. One part of the Standards was a quantitative statement of size of collection of printed materials required for minimum service: for books, the minimum was 6,000 to 10,000 volumes for a school population of 200 to 999, and 10 books per student for a school population over 1000. Personnel and program requirements were also stated in the Standards. Secondly, in the sixties the Russian Sputnik caused concern about the quality of education in the United States, and there was a general push toward improving all education.

In May 1968, Peggy Sullivan began her final report on a massive school library improvement project--the Knapp project--in this way:

Any history of school library development in the United States will have to recognize the decade of the 1960's as a time of ferment. The Knapp School Libraries Project, spanning the middle five years of that decade, from March 1, 1963, through February 29, 1968, should be recognized as product, contributor, and benefactor of that ferment. The publication of Standards for School Library Programs in 1960 was the prime cause of ferment, and the School Library Development Project which followed focused attention on school libraries. All activities and evaluations in school librarianship must be viewed against the background of education and the pressures and policies which shape them. [P. ix]

The Knapp project was funded by a \$1.1 million grant from the Knapp Foundation in 1962. It was carried out under the sponsorship of the

American Association of School Librarians. Eight school libraries, three secondary and five elementary, were chosen to participate. The four objectives of the project were: (1) to bring the library programs in the eight schools up to the levels of the 1960 Standards for School Library Programs; (2) to involve teacher education institutions in the operation of these school library programs; and (3) to enable librarians, educators, and other interested persons to observe the programs implied in the Standards in action; thus (4) encouraging local support for adequate school library programs. The complete report of the project, which ended in March 1968, is Realization: Final Report of the Knapp School Libraries Project (1968).

Although libraries received a great deal of attention in the 1960s, other ideas about education became equally important at the same time.

Trump (1964) describes one of the new approaches:

Considerable emphasis is placed on discovery these days in proposals to improve the quality of education. The goal is to produce an educational setting where students inductively seek answers to questions and learn concepts and skills through personal experience. This trend emphasizes learning by doing. . . .

This type of learning may be called independent study. Not only are these kinds of experiences educationally sound, but they also have real significance from the point of view of teacher utilization and the physical setting for learning. Students engaged in independent study need to be under the supervision of competent adults qualified in the subject matter being studied, but these adults need not be fully qualified professional teachers because they are not responsible for planning and supervising the whole instructional system.

Independent study facilities include laboratories, workrooms, and the library where students may read, view, listen, and work with the appropriate tools in each area of human knowledge. All of these learning experiences are related and thus should be placed in locations where they are as accessible to students as possible. The amount of time which students spend in independent study varies

with the maturity, the talents and the motivations of the individual students. For the total population of the school, and including all age levels, the present best intelligent guess is that independent study may occupy about 40 percent of the total time students are regularly scheduled in school. [Pp. 2-3]

A broader, though similar, view of the activity of this time is well stated by Francis S. Chase (Keppel, 1966):

We have left the kind of world in which teacher's chief function was to convey information. The school composed chiefly of classrooms is obsolete. In schools of the future, upwards of half of the student's time may be spent in the library, in science laboratories, or in other workrooms where he can search for knowledge, analyze data, reflect upon the ideas which he is encountering, and put his hunches and conclusions in writing.

The school library will provide a variety of resources, including recordings, microfilms, slide films, videotapes, charts, maps, and pictures. The most important of the resources offered, however, will be books in abundance in the humanities, the social studies, the sciences, and the practical arts--books of such range and variety that there will be something to arouse the interest and further the learning of the dull and the bright, the practical and the theoretical, the poor reader, and the advanced student. [P. 123]

Half of the skills identified in the reference area reflect the philosophy that children should use the library as a place of learning. However, it is necessary to look at activity in other areas of education, because library skills are not the only desired objective. Davies (1969) says:

The school library becomes a force for educational excellence when it functions as an integral supporting component of the total educational program. Perspective in viewing the educational significance of the school library begins logically with building an understanding of education itself. For it is the educational pattern, design and structure which gives purpose and direction to the school library program. The library program and the educational program are interdependent, one and inseparable. The attempt to develop an adequate understanding of the school library program in isolation from the educational program is comparable to attempting to construct a building without blueprint or specifications. It is the educational program which gives purpose and direction, scope and dimension, form and substance, significance and value to the school library program. [P. 3]

The Board of Directors of the American Association for the Advancement of Science established the AAAS Commission of Science Education in 1962. One major activity of the commission has been to prepare and evaluate

science materials for the early grades. Most of these materials were designed to improve the child's skills in using the processes in science. With a process approach to science, the child would not be subjected to rote learning of facts.

In 1963 the National Council for the Social Studies published a revised and exhaustive document on study skills in its thirty-third yearbook Skill Development in the Social Studies. The appendix by Johns and Fraser (1963) is largely a well-organized list of study skills. The organization used points out two facets of the area of reference skills--the great number of skills that can be identified, and the interrelationships that exist across subject areas. Part II of the appendix lists approximately ninety skills that are labeled "skills which are a major responsibility of the social studies." Approximately ninety more skills in Part I are labeled "skills which are a definite but shared responsibility of the social studies." These listings of skills were further classified into areas of teaching activities, and generalized timetables for when the skills should be taught are designated. The three suggested approaches to teaching the skills are: (1) introduce, through planned readiness experiences, (2) develop systematically, and (3) reteach, maintain, and extend. The time placement categories are: early primary, late primary, early intermediate, late intermediate, junior high school, and senior high school. In the primary and intermediate categories, the chief concern of this project, approximately seventy skills were designated "to be introduced, through planned readiness," and thirty of these were to be "developed systematically."

Such a delineation of 180 skills points out again the complexity of study skills as a whole and provides one way of gaining an overview of the field. Helen McCracken Carpenter (1965, p. 28), although editor of

the NCSS yearbook with its multiple skills listing, has been able to regroup these many skills into just two. She writes: "Two basic skills underlie all others in the gathering of information. One, facility with alphabetical order, is relatively easy, and most children reach a functional level during the primary years. The other, analysis to determine key words as guides in the search, is subtle and elusive. It needs continual emphasis and should begin in the early primary grades with examining of the titles of books for clues to contents."

Because this great number of skills can be distinguished, and because most of these skills cross subject areas, the search in reference skills was not primarily within the textbook area. Sources such as Skill Development in the Social Studies state curriculum guides for library skills, and the well-developed objectives of a school system such as Oak Park, Illinois, seemed more likely to cut across the subject barriers than textbook series. As a result, the reference subarea may have a less pragmatic source than the maps and graphs subareas. Authors of other articles, books, and curricula from various states and cities produced many variations of number and organization of skill sequences.

Perhaps the best way to demonstrate the differences that exist between the skills as they are presented by various authors and curriculum guides is to compare descriptions given in a variety of sources. Take, for example, our statement of study skills objective D.7.a (see Appendix F): The child is able to (a) alphabetize words by first and second letters, and (b) locate target words in dictionaries and encyclopedias. At Level D, the

objective is pegged at roughly the fourth-grade level. In other sources, a similar objective may be stated somewhat differently and/or pegged at a different grade level. This is shown in Table 3, which lists descriptions and grade level designations of skills similar to our D.7.a found in a variety of sources.

A careful study of Table 3 reveals more than the problems of different grade level placement by different authorities. An additional problem is that of terminology. The terms "introduce," "main emphasis," "planned readiness," "develop systematically," "formal presentation," "understands," are all unacceptable in the statement of meaningful behavioral objectives. Needless to say, this terminology confounded the task of forming a sequential placement of reference skills.

Another major problem is that of assigning responsibility for both teaching and evaluating mastery of the reference skills. Consideration of a single strand from the reference subarea--using the school library--demonstrates the difficulty. Some schools will schedule classes into the library for "library instruction" by the school librarian. Other school systems will maintain an open-unscheduled type of library, where the librarian's main function is to offer individual assistance rather than group instruction. If the classroom teacher in an open system doesn't happen to teach use of the card catalog, who will assume this responsibility for the children who are not motivated to go to the library for independent work? Further difficulty is caused by the problem of subject areas. Is the card catalog a language skill because the language text may have a three-page chapter describing library card catalogs? Or is it a science skill because children need to know how to find books on chemistry while studying such a unit? Answers to these questions must, of course, be provided in individual schools.

Table 3
Alphabetizing Skill Compared by Definition and Grade Placement

<u>Reference</u>	<u>Skill as Described in Source</u>	<u>Grade Placement</u>
Reid & Crane, 1967, 1965, pp. 94-95	Groups alphabet into three sections: Drill using first and second letters of a word to locate target word in dictionary.	Grade 3
Oak Park, Ill.: Whiston et al., 1967, pp. 70-71	Alphabetizes easily by first, second, or third letter; begins to find titles in pamphlet files, uses card catalog with ease; completes transition from picture dictionary to standard beginning dictionary; uses as needed.	Grades 3-4
Seattle, Wash.: Seattle Public Schools, 1966, pp. 7, 9, 12	Acquaint children with simple picture dictionary. Introduce location of some basic reference books; picture dictionaries.	Grade 2 Grade 3
Greenwich, Conn.: <u>Library Skills: What Pupils Need Grade by Grade</u> , 1966, p. 127	Practices alphabetizing through second and third letters. Acquaints children with dictionaries in the library. Develop further alphabetical skills. Encourage use of simple dictionaries and encyclopedias. First, second letter alphabetizing practice.	Grade 4 Grade 2 Grade 3
North Carolina State Department of Public Instruction, 1961, p. 20	Alphabetical order -- "Be introduced" Alphabetical order -- "Reteach and review" Dictionary (abridged) -- "Be introduced" Dictionary (abridged) -- "Reteach and review"	Grade 3 Grades 4-12 Grade 4 Grades 5-12
Beck & Pace, 1966, pp. 51-53	Biographical dictionaries	Grades 5-6

<u>Reference</u>	<u>Skill as Described in Source</u>	<u>Grade Placement</u>
Johns & Fraser, 1963, p. 313	Make efficient use of the dictionary: Alphabetize a list of words according to the first letter; according to the second and third letters. "Introduce, through planned readiness."	Late primary
	Same objective. "Develop systematically."	Early intermediate- Junior high school
	Same objective. "Reteach, maintain and extend."	Senior high school
Wisconsin Department of Public Instruction, 1970, pp. 6-10	Use of alphabetical order. Introduction to abridged dictionary.	Grades 3-6 Grades 3-6
Palovic & Goodman, 1966, p. 19	Formal presentation, alphabetizing to the fourth letter. Dictionary work.	Grade 3 Grades 4-5-6
Iowa State Department of Public Instruction, 1966, 37-38	Alphabetical order--introduced. Same objectives--"Main emphasis."	Grades 1-2 Grades 3-4
Oklahoma State Department of Education, 1969, pp. 8-9	Understands the purpose of the dictionary. Practices alphabetizing. Locates and interprets definitions. Uses dictionary for spelling, synonyms, syllabication and pronunciation, antonyms and capitalization. Continues acquaintance with unabridged dictionary.	Grades 1-2

Still another problem is inherent in the fact that most of the reference skills are designated to be "reviewed" or "retaught" so that what evolves is a spiral pattern of teaching every skill each year, with no guides stated as to what can be mastered at the various levels of the spiral. What library skills are absolutely essential for an adult to find a book about gardening in the public library? One answer could be: None, the person could ask the librarian. However, most adults prefer more independence of action. Careful analysis of the task shows a need at a lower level for simple alphabetical skills, which can be mastered at the primary level. Our approach, then, was first to identify essential skills and then to trace the spiral of development in order to find various checkpoints along the skill development sequence. These checkpoints eventually became either the teacher observations or the paper and pencil tests constructed for the Design.

"Correctness" of placement has been checked with some textbooks, but examination of textbook series, conferences with teachers and, eventually, pupil tryouts showed that there is no agreement on grade placement. Individual differences in experience and ability account for a great deal of the difficulty in specifying grade placement for the reference skills.

The assumption that study skills include use of the school library, and that such skills are related to school achievement, seems to have been a fundamental premise of the Elementary and Secondary Education Act of 1965 (P.L. 89 - 10), under which great amounts of money were appropriated for school libraries. Frank Stevens (1966), in an article called "An Even Break for the Poor," emphasizes the need for all children to have access to good library services.

Since the school library is an integral part of the school's instructional program, efforts to provide special programs, projects, and resources to improve the education of deprived children must necessarily take cognizance of school library service: specifically more librarians and library clerks, new or improved library facilities, and more books and other resources than Title II alone would allow. Since one of the biggest problems in working with the disadvantaged is teaching them to read and maintaining their interest in reading, the role of the library is crucial. [P. 1012]

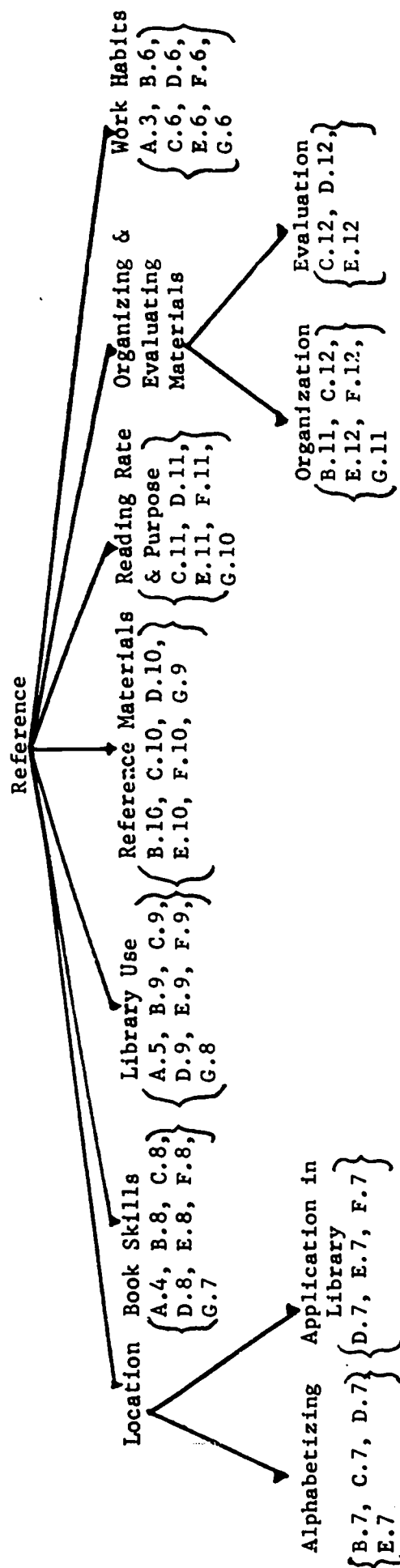
Thus, in the area of reference skills, it is easy to find literature which describes the importance of the study skills, but it is more difficult to find sources which define the skills adequately and nearly impossible to arrive at a consensus on skill placement. From the array of skills listed and described in the various sources, we selected those that were either mentioned more frequently or those that fell within certain frequently mentioned organizational patterns. Settling upon an organizational structure was our next step. Many more educators have been willing to state overall organizational patterns than to venture definitive grade placements for skills. For example, Carpenter's two general skills were mentioned previously (Carpenter, 1965); and Johns and Fraser (1963) organized their work into eight categories for the "shared skills": locating information; organizing information; evaluating information; acquiring information through reading; acquiring information through listening and observing; communicating orally and in writing; interpreting pictures, charts, graphs, tables; and working with others. Other sources examined were Herbert (1966, p. 66), who presents three organizational areas, the receptive, the reflective, and the expressive; Lowrie (1961, pp. 98-99), who uses ten organizational areas: helping children, to know and love books, introduction to the library, parts of a book,

classifications and arrangement of books and materials, the card catalog, encyclopedias, dictionaries, special reference books, magazines, and using the public library; and Mahoney (1965), who arranges various skills under seven areas: the alphabet, the dictionary, parts of a book, encyclopedias, library skills, study methods, and research skills.

Our approach in creating an organizational structure around each skill we considered to be essential was to search for information, consider whether the information met the need, and, finally, use that information.

The organization of the reference subarea into strands is shown in Figure 3. From left to right across Figure 3, the skill strands range from simple alphabetical location skills, through "using books" and four other strands to the most comprehensive strand, "work-habits." Each strand has a variety of skills within it, and each follows a spiral pattern of using more sophisticated skills with increasing independence at each higher level. Part of the alphabetical-location strand and two others are "library use" strands. A school system's library program will affect implementation of the reference skills objectives in two ways: (1) A school may desire to add objectives to cover their specific method of handling library materials--how they have children check out materials or how materials are arranged in their school library. (2) The stage of development of the school's library program will affect the progress of the reference skills program. Many school systems are just beginning library programs at the elementary level. These schools may need to add either more materials or more library personnel to provide an adequate library base for development of a reference study skills program.

Figure 3
Strands and Divisions Within the Subarea of Reference



Code numbers refer to specific skills in the Outline of Study Skills

The status quo of most school library systems is discussed in School Libraries in the United States (1967). This report identified fourteen major problems:

1. The absence of libraries in many schools.
2. The gap between school library resources and programs as specified in national standards and those which actually exist.
3. The need for more rapid implementation of the use of new materials and techniques in school library service.
4. The special difficulties of inner-city areas in establishing adequate school library programs.
5. The difficulties and inefficiencies inherent in providing school library services in very small school districts and in thinly populated rural areas.
6. The high capital cost of school library facilities.
7. The critical problems associated with school library manpower and training.
8. The need for increased support of state school library supervisory program.
9. The lack of provision for school library staff or equipment in ESEA Title II.
10. The copyright problem.
11. The need for better school library statistics.
12. The need for research on school library programs.
13. The need to hasten the implementation of centralized technical processing for school libraries.
14. The need to hasten provision of district materials center facilities and services. [Pp. 58-65]

Two of these problems, numbers 1 and 2, cannot be separated from reference study skills and must be mentioned here.

If schools have school libraries (problem 1) equipped with even minimal resources and programs (problem 2), then that school will be able to cope with the references subarea of the Wisconsin Design for Reading Skill Development. As important as the school library is, nothing can stop a good teacher with only a dictionary and classroom encyclopedias, or textbooks, from encouraging his or her children to learn "how to find out," no matter what subject matter they wish to explore. If all teachers answer children's questions by saying, "Let's look it up," the reference skills will be taught.

References

- American Association of School Librarians. Standards for school library library programs. Chicago: American Library Association, 1960.
- Beck, M.V., & Pace, V. M. Guidebook for teaching library skills, using reference materials, Book 3. Minneapolis: T. S. Denison, 1966.
- Carpenter, H. M. Treasure hunt for information. Instructor, 1965, 74, 27, 28, 110.
- Collier, R. E., & Vodicka, E. M. The place of maps in the primary grades. School Activities, 1960, 31, 212-213.
- Davies, R. A. The school library; A force for educational excellence. New York: R. R. Bowker, 1969.
- Herbert, H. L. Classroom diagnosis of work-study skills. Proceedings of a Conference on Reading. Pittsburgh: University of Pittsburgh, 1966.
- Iowa State Department of Public Instruction. The educational program; A curriculum design. Des Moines: Iowa State Department of Public Instruction, 1966.
- Jarolimek, J. The psychology of skill development. Pp. 17-33, in H. M. Carpenter (Ed.). Skill development in the social studies, 33rd yearbook of the National Council for the Social Studies. Washington: NCSS, 1963.
- Job, K., & Weiser, L. Study lessons in map reading. Chicago: Follett, 1965.
- Johns, E., & Fraser, D. M. Appendix, pp. 310-332, in H. M. Carpenter (Ed.), Skill development in the social studies, 33rd yearbook of the National Council for the Social Studies. Washington: NCSS, 1963.
- Keppel, F. The necessary revolution in American education. New York: Harper and Row, 1966.
- Kohn, C. F. Interpreting maps and globes. Pp. 146-177, in Skills in social studies, 24th yearbook of the National Council for the Social Studies. Washington: NCSS, 1953.
- Library skills: What pupils need grade by grade. Grade Teacher, 1966, 84, 126-133.
- Lowrie, J. E. Elementary school libraries. New York: Scarecrow Press, 1961.

Mahoney, S. Basic Study Skills and Tools, Elementary English, 1965, 42, 905-915.

North Carolina State Department of Public Instruction. Developing a good school library program. Raleigh: North Carolina State DPI, 1961.

Oklahoma State Department of Education. Curriculum guide for the teaching of library skills, Grades K-12. Oklahoma City: Oklahoma State Department of Education, 1969.

Otto, W., & Askov, E. Wisconsin design for reading skill development: Rationale and guidelines. Minneapolis: National Computer Systems, 1970.

Palovic, L., & Goodman, E. B. The elementary school library in action. Englewood Cliffs, N.J.: Prentice-Hall, 1966.

Reid, H. C., & Crane, H. W. Elementary English, 3. Boston: Ginn and Company, 1965, 1967.

Sabaroff, R. Maps and mapping in the first grade. Journal of Geography, 1959, 58, 445-451.

Savage, T. V., Jr., & Bacon, P. Teaching symbolic map skills with primary grade children. Journal of Geography, 1969, 68, 491-496.

Seattle Public Schools. Library experiences for elementary school children. Seattle, Wash.: Seattle Public Schools, 1966.

School Libraries in the United States, a report prepared for the National Advisory Commission on Libraries. New York: Nelson Associates, 1967.

Stevens, F. A. An even break for the poor, Library Journal, 1966, 91, 1011-1013.

Sullivan, P. (Ed.) Realization: Final report of the Knapp school libraries project. Chicago: American Library Association, 1968.

Trump, J. L. Changing concepts of instruction and the school library as a materials center. In M.H. Mahar (Ed.), The school library as a materials center: Educational needs of librarians and teachers in its administration and use. U.S. Department of Health, Education and Welfare. Washington, D.C.: Government Printing Office, 1964.

Weintraub, S. What research says to the reading teacher. Reading Teacher, 1967, 20, 345-349.

Whipple, G., & James, P. E. Instructing pupils in map reading. Social Education, 1947, 11, 205-208.

Wisconsin Department of Public Instruction. Learning to use media, Bulletin No. 197. Madison: Wisconsin DPI, 1970.

Appendix A

Maps: Additional Sources Consulted

- Anderzhon, M. L. Steps in map reading. Chicago: Rand McNally, 1960.
- Asa, J. Maps and slow learners. Journal of Geography, 1951, 50, 145-149.
- Barnes, D., & Burgdorf, A. Study Skills, Books 1-3. Boston: Allyn & Bacon, 1970.
- Barton, T. F. Geographic instruction in the primary grades. Pp. 214-216 in the 19th yearbook of the National Council for the Social Studies. Washington: NCSS, 1948.
- Bartz, B. S. Maps in the classroom. Journal of Geography, 1970, 69, 18-24.
- Bathurst, L. H. Developing map reading skills. Journal of Geography, 1961, 60, 26-32.
- Buchanan, C. D. Programmed geography, Book I. New York: Macmillan, 1963.
- Buchanan, C. D. Programmed geography, Book II. New York: Macmillan, 1964.
- Chase, H. Map skills in the first grade. Social Education, 1955, 19, 309-310.
- Chase, H. Map skills at the third grade level. Social Education, 1956, 20, 13-14.
- Chase, H. Map skills developed in grade six. Social Education, 1956, 20, 60-62.
- Curriculum Branch of the Division of Instructional Services of the Los Angeles City Schools. Sequence chart of map and globe skills and understandings. Chicago: Denoyer-Geppert, 1963.
- Estep, I. Good times with maps. Chicago: Melmont Publishers, 1962.
- Fraser, D. M., & Johns, E. Developing a program for the effective learning of skills. Pp. 296-309 in H. M. Carpenter (Ed.), Skill development in the social studies, 33rd yearbook of the National Council for the Social Studies. Washington: NCSS, 1963.
- Harris, R. M. Map and globe usage. New York: Rand-McNally, 1960.
- Holub, R. A. Introducing maps in the fourth grade. Journal of Geography, 1953, 52, 374-377.
- Howe, G. F. A study of the ability of elementary school pupils to read maps. Pp. 486-491 in The teaching of geography, 32nd yearbook of the National Society for the Study of Education. Chicago: NSSE, 1933.

- James, L. B. Hypothetical maps. Journal of Geography, 1951, 50, 361-366.
- Job, K., & Weiser, L. Study lessons in map reading. Chicago: Follett, 1965.
- Johnson, E. M., & Wonsavage, E. P. (Eds.), Atwood, B. S., & Paine, C. A. Map skills for today, 3-6. Columbus, Ohio: American Educational Publications, 1965.
- Johnson, E. M., & Wonsavage, E. P. (Eds.), Atwood, B. S., & Paine, C. A. Readiness for map skills, 2. Columbus, Ohio: American Educational Publications, 1965.
- Latitude and longitude. Chicago: Coronet Instructional Films, 1962.
- Maps: How we read them. Chicago: Coronet Instructional Films, 1967.
- Map skills project, Book 1. New York: Scholastic Book Services, 1964.
- McAulay, J. D. Map learnings in the fourth grade. Journal of Geography, 1964, 63, 123-127.
- Naslund, R. A., & Brown, C. M. Map and globe skills, MG II. Chicago: Science Research Associates, 1964.
- Odell, C. B. The use of maps, globes, and pictures in the classroom. Pp. 202-207 in P. E. James (Ed.), New viewpoints in geography, 29th yearbook of the National Council for the Social Studies. Washington: NCSS, 1959.
- Pattison, W. D. How far? Chicago: Rand-McNally, 1965.
- Pattison, W. D. Where? Chicago: Rand-McNally, 1965.
- Pattison, W. D. Which way? Chicago: Rand McNally, 1965.
- Robinson, H. A., Taylor, S. E., & Frackenpohl, H. Study skills library, CCC-II. Huntington, N. Y.: Educational Developmental Laboratories, 1961.
- Robinson, H. A., Taylor, S. E., & Frackenpohl, H. Study skills library, CCC-III, Huntington, N. Y.: Educational Developmental Laboratories, 1965.
- Rushdoony, H. A. Shifting of skills toward lower grades--achievement in map reading: An experimental study. Elementary School Journal, 1963, 70, 70-75.
- Rushdoony, H. A. A child's ability to read maps: Summary of the research. Journal of Geography, 1968, 67, 213-219.
- Sabaroff, R. Using maps in the second grade. Journal of Geography, 1968, 57, 414-415.

Sabaroff, R. Improving the use of maps in the elementary school. Journal of Geography, 1961, 60, 184-188.

Successful teaching with globes. Chicago: Denoyer-Geppert, 1957.

Towler, J. O., & Nelson, L. D. The elementary school child's concept of scale. Journal of Geography, 1968, 67, 24-28.

Wagner, L. D. Measuring the map-reading ability of sixth-grade children. Elementary School Journal, 1953, 53, 338-344.

Whipple, G. Geography in the elementary social studies program: Concepts, generalizations, and skills to be developed. Pp. 118-136 in P.E. James (Ed.), New viewpoints in geography, 29th yearbook of the National Council for the Social Studies. Washington: NCSS, 1959.

Whiston, C., Morton, M., & Bailey, H. The Oak Park study skills charts. The Instructor, 1967, 76, 63-73.

Appendix B

Maps: Social Studies Textbooks Consulted (by publisher's series)

ALLYN AND BACON Boston, Massachusetts

Polansky, L., Wann, K., & Warman, H. The changing earth and its
its people. Grade 4. 1965.

Wann, K., Sheehy, E., & Spodek, B. Curious Chester. Kindergarten.
1967.

Wann, K., Sheehy, E., & Spodek, B. Learning about our families.
Grade 1. 1962.

Wann, K., Stull, E., & Warman, H. Our changing nation and its
neighbors. Grade 5. 1967.

Wann, K., Wann, F. C., & Sheehy, E. D. Learning about our neighbors.
Grade 2. 1962.

Wann, K. D., Warman, H. J., & Canfield, J. K. Man and his changing
culture. Grade 6. 1967.

Wann, K., Vreeland, J., & Conklin, M. Learning about our country.
Grade 3. 1963.

AMERICAN BOOK COMPANY New York, New York.

Davis, O. L., Jr., Arnoff, M., Blough, J. A., Hunkins, F. P., &
Ramsey, C. P. Comparing ways and means. Grade 3. 1971.

Davis, O. L., Jr., et al. Observing people and places. Grade 2.
1971.

Davis, O. L., Jr., et al. Seeing near and far. Primer. 1971.

Davis, O. L., Jr., et al. Asking about the U.S.A. and its neighbors.
Grade 5. 1971.

Davis, O. L., Jr., et al. Learning about countries and societies.
Grade 6. 1971.

Davis, O. L., Jr., et al. Investigating communities and cultures.
Grade 4. 1971.

- Fraser, D. M., & Hoy, H. E. Our community. Grade 3. 1961.
- Fraser, D. M., & Hoy, H. E. Our hemisphere. Grade 5. 1961.
- Fraser, D. M., & Hoy, H. E. Our neighborhood. Grade 2. 1961.

BENEFIC PRESS
Chicago, Illinois

- Stamford, C., McCall, E., & Cunningham, F. You and regions near and far. Grade 4, 1964.
- Stamford, C., McCall, E., & Cunningham, F. You and the Americas. Grades 6-7. 1965.
- Stamford, C., McCall, E., & Cunningham, F. You and the United States. Grade 5. 1964.
- Stamford, C., McCall, E., & Cunningham, F. You and the world. Grades 6-7. 1966.
- Stamford, C., McCall, E., & Gue, R. You are here. Grade 1. 1963.
- Stamford, C., McCall, E., & Gue, R. You and the community. Grade 3. 1963.
- Stamford, C., McCall, E., & Gue, R. You and the neighborhood. Grade 2. 1967.

FOLLETT PUBLISHING CO.
Chicago, Illinois

- Follett, D. W., & Nilsen, W. D. Exploring world communities. Grade 3. 1969.
- Gross, H. H., Follett, D. W., Gabler, R. E., Burton, W. L., & Ahlswede, B. F. Exploring regions near and far. Grade 4. 1969.
- Gross, H. H., Follett, D. W., Gabler, R. E., Burton, W. L., & Ahlswede, B. F. Exploring regions of the western hemisphere. Grade 5. 1969.
- Joyce, W. W., Houston, W. R., Gross, H. H., & Lee, S. D. Exploring regions of Latin America and Canada. Grade 6. 1968.

McIntire, A. Exploring with friends. Grade 1. 1968.

Yohe, R. S., Cahill, G. A., Gross, H. H., & Gritzner, C. F. Exploring regions of the eastern hemisphere. Grade 6. 1969.

GINN AND COMPANY
Boston, Massachusetts

Crabtree, E. Understanding your country and Canada. Grade 5A. 1968.

Dederick, N. Your people and mine. Grade 4. 1969.

Lally, L. Your neighborhood and the world. Grade 2. 1967.

Lindop, E. Understanding Latin America. Grade 6A. 1966.

Mason, B. Your country and mine. Grade 5. 1966.

McClellan, J. Your world and mine. Grade 6. 1965.

Swinney, G. M. Your school and neighborhood. Grade 1. 1966.

Thomas, E. Your towns and cities. Grade 3. 1968.

Thomas, E., & Eastland, P. Your school and home. Primer, 1966.

HARCOURT, BRACE AND WORLD
New York, New York

Brandwein, P. F., Bauer, N. W., Daly, D. J., Knutson, J. N., Scott, W. R., Simpson, E. L., & Wise, A. M. Concepts and values. Grade 5. 1970.

Brandwein, P. F., et al. Concepts and values. Grade 6. 1970.

Brandwein, P. F., et al. Concepts and values. Grade 2. 1970.

Brandwein, P. F., et al. Concepts and values. Grade 3. 1970.

Brandwein, P. F., et al. Concepts and values. Grade 4. 1970.

HARPER & ROW
New York, New York

Burnette, O. L., Jr., & Ralph, L. L. Basic social studies, 5. Grade 5. 1964.

Hagaman, A. P. Basic social studies, 4. Grade 4. 1964.

Hagaman, A. P., & Durell, T. J. World cultures past and present. Grade 6. 1964.

Wein Partch, D. Our basic needs. Grade 3. 1965.

Reese, T. K. Living together in the neighborhood. Grade 2. 1964.

HEATH
Boston, Massachusetts

Preston, R. C. & Clymer, E. Communities at work. Grade 3. 1964.

Preston, R. C., Cox, E. A., & Wavle, A. S. A new hometown. Grade 1. 1964.

Preston, R. C., Emerson, C., Elizabeth, P., & Schrader, A. F. Four lands, four peoples. Grade 4. 1966.

Preston, R. C., McIntosh, M., & Cameron, M. M. Greenfield, U.S.A. Grade 2. 1964.

Preston, R. C., & Tuttle, J. In Latin American lands. Grade 6. 1967.

Preston, R. C., & Tuttle, J. In these United States. Grade 5. 1965.

HOLT-RINEHART
New York, New York

Buckley, P., & Jones, H. Living as neighbors. Grade 2. 1966.

Buckley, P., & Jones, H. Our growing city. Grade 3. 1968.

Buckley, P., & Jones, H. William, Andy and Ramin. Grade 4. 1966.

Carls, N., Bacon, P., & Sorenson, F. E. Knowing our neighbors in the United States. Grade 5. 1966.

Carls, N., Sorenson, F. E., & McAulay, J. D. Knowing our neighbors in Canada and Latin America. Grades 5-6. 1964.

Carls, N., Templin, E. M., Sorenson, F. E., & McNeal, R. H. Knowing our neighbors around the earth. Grade 6. 1966.

LAIDLAW

River Forest, Illinois

King, F. M., Bracken, D. K., & Sloan, M. A. Communities and social needs. Grade 2. 1968.

King, F. M., Bracken, D. K., & Sloan, M. A. Families and social needs. Grade 1. 1968.

King, F. M., Bracken, D. K., & Sloan, M. A. People at home. Readiness. 1968.

King, F. M., Bracken, D. K., & Sloan, M. A. Regions and social needs. Grade 3. 1968.

King, F. M., Rudman, H. C., Epperly, H. V., & Cooke, R. J. The social studies and our country. Grade 5. 1970.

MACMILLAN COMPANY

New York, New York

Cutright, P., & Jarolimek, J. Living as world neighbors. Grades 4-6. 1966.

Cutright, P., & Jarolimek, J. Living in the Americas. Grades 4-6. 1966.

Cutright, P., & Jarolimek, J. Living in the Old World. Grades 4-6. 1966.

Cutright, P., & Jarolimek, J. Living in the United States. Grades 4-6. 1966.

Cutright, P., Jarolimek, J., & Clark, M. K. Living in America Today and Yesterday. Grade 3. 1969.

Cutright, P., Jarolimek, J., & Clark, M. K. Living in our country and other lands. Grade 4. 1966.

Jarolimek, J., & Carey, E. B. Living as school friends. Grade 1. 1966.

Jarolimek, J., & Carey, E. B. Living in places near and far. Grade 2. 1969.

PRENTICE-HALL

Englewood Cliffs, New Jersey

Presno, V., & Presno, C. Human actions in American societies: Past and present. Grade 5. 1967.

Presno, V., & Presno, C. Human actions in European societies: Past and present. Grade 6. 1967.

Presno, V., & Presno, C. Human actions in four societies: India, Spain, Brazil, Egypt. Grade 4. 1967.

Presno, V., & Presno, C. People and their actions. Grade 1. 1967.

Presno, V., & Presno, C. People and their actions in social roles. Grade 3. 1967.

Presno, V., & Presno, C. People and their social actions. Grade 2. 1967.

RAND McNALLY

New York, New York

Borchert, J. R., & McGuigan, J. Around the home. Grade 3. 1961.

Borchert, J. R., & McGuigan, J. Many lands. Grade 4. 1961.

Jones, E. D., Nystrom, J. W., & Harter, H. Within our borders. Grade 5. 1961.

Nystrom, J. W., Jones, E. D., & Harter, H. Beyond our borders. Grade 6. 1954.

SCOTT, FORESMAN

Chicago, Illinois

Hanna, P. R., & Hoyt, G. A. At home. Readiness. 1965.

Hanna, P. R., & Hoyt, G. A. At school. Grade 1. 1965.

Hanna, P. R., & Hoyt, G. A. In the neighborhood. Grade 2. 1965.

Hanna, P. R., Hoyt, G. A., & Kohn, C. F. In city, town and country. Grade 3. 1965.

Hanna, P. R., Wise, H. F., Kohn, C. F., & Linely, R. A. Beyond the Americas. Grade 6. 1964.

Hanna, P. R., Wise, H. F., Kohn, C. F., & Linely, R. A. In all our states. Grade 4. 1964.

Hanna, P. R., Wise, H. F., Kohn, C. F., & Linely, R. A. In the Americas. Grade 5. 1964.

SCIENCE RESEARCH ASSOCIATES
Chicago, Illinois

Senesh, L. Our working world: Cities at work. Grade 3. 1966.

Senesh, L. Our working world: Families at work. Grade 1. 1964.

Senesh, L. Our working world: Neighbors at work. Grade 2. 1965.

SILVER BURDETT COMPANY
Morristown, New Jersey

Anderson, E. A. Communities and their needs. Grade 2. 1969.

Anderson, E. A. Families and their needs. Grade 1. 1966.

Barrows, H. H., Parker, E. P., & Sorenson, C. W. Our world lands. Grade 6. 1964.

Cooper, K. S., Sorenson, C. W., & Todd, L. P. Learning to look at our world. Grade 4. 1967.

Cooper, K. S., Sorenson, C. W., & Todd, L. P. The changing new world. Grade 5. 1964.

Weaver, V. P. People use the earth. Grade 3. 1967.

L. W. SINGER CO., INC.
Syracuse, New York

Hunnicut, C. W., & Grambs, J. D. We have friends. Grade 2. 1963.

Hunnicut, C. W., & Grambs, J. D. We live with others. Grade 1. 1963.

Hunnicut, C. W., & Grambs, J. D. We play. Readiness. 1963.

Hunnicut, C. W., & Grambs, J. D. Your community and mine. Grade 3. 1966.

Hunnicut, C. W., Grambs, J. D., & Benjamin, W. The great adventure. Grade 6. 1963.

Patterson, F., Patterson, J., Hunnicutt, C. W., Grambs, J. D., & Smith, J. Man changes his world. Grade 4. 1967.

Patterson, F., Patterson, J., Hunnicutt, C. W., Grambs, J. D., & Smith, J. This is our land. Grade 5. 1967.

Appendix C

Graphs: Additional Sources Consulted

- Beatty, L., Gibb, E. G., Guy, W. T., Jackson, S. B., Sauble, I., Stone, M. H., Weaver, J. F., & Wilder, R. L. Mathematics for the elementary school, 1-6. Pasadena, Calif.: A. C. Vroman, 1965.
- Brown, G., Paine, C., & Malkofsky, M. Introducing table and graph skills. Columbus, Ohio: American Education Publications, 1970.
- Brown, G., Paine, C., & Malkofsky, M. Developing table and graph skills. Columbus, Ohio: American Education Publications, 1970.
- Brown, G., Paine, C., & Malkofsky, M. Expanding table and graph skills. Columbus, Ohio: American Education Publications, 1970.
- Brown, G., Paine, C., & Malkofsky, M. Using table and graph skills. Columbus, Ohio: American Education Publications, 1970.
- Brueckner, L. J., Merton, E. L., & Grossnickle, F. E. Moving ahead in arithmetic, 1-6. New York: Holt, Rinehart, & Winston, 1963.
- Busswell, G. T., Brownell, W. A., & Sauble, I. Arithmetic we need, 1-6. Boston: Ginn, 1963.
- Carpenter, H. M. Interpreting graphic materials. The Instructor, 1964, 74, 21-22, 32.
- Clarence, Sister M., Socorro, Sister M., McDonnell, W. H., & Bezuska, S. J. Progress in mathematics, 1-6. New York: W. H. Sadlier, 1965.
- Clark, C. H., Beatty, L. S., Payne, J. N., & Spooner, G. A. Elementary mathematics, 1-6. New York: Harcourt, Brace and World, 1966.
- Coppola, J. N. Graphs tell a story. Arithmetic Teacher, 1969, 16, 305.
- Deans, E., Kane, R. B., & Oesterle, R. A. Meeting mathematics, 1. New York: American Book, 1964.
- Deans, E., Kane, R. B., & Oesterle, R. A. Exploring mathematics, 2. New York: American Book, 1964.
- Deans, E., Kane, R. B., & Oesterle, R. A. Developing mathematics, 3. New York: American Book, 1964.
- Deans, E., Kane, R. B., & Oesterle, R. A. Understanding mathematics, 4. New York: American Book, 1964.

- Deans, E., Kane, R. B., & Oesterle, R. A. Learning mathematics, 5. New York: American Book, 1964.
- Deans, E., Kane, R. B., & Oesterle, R. A. Unifying mathematics, 6. New York: American Book, 1964.
- DeVault, M. V., Osborn, R., & Darling, D. W. Discovering mathematics, 1-6. Columbus, Ohio: Charles E. Merrill Books, 1966.
- Duncan, E. R., Capps, L. R., Dolciani, M. P., Quast, W. G., & Zweng, M. Modern school mathematics, 1-6. Boston: Houghton Mifflin, 1967.
- Educational Research Council. Greater Cleveland mathematics program, K. Chicago: Science Research Associates, 1961.
- Educational Research Council. Greater Cleveland mathematics program, 1. Chicago: Science Research Associates, 1961.
- Educational Research Council. Greater Cleveland mathematics program, 2. Chicago: Science Research Associates, 1961.
- Educational Research Council. Greater Cleveland mathematics program, 3. Chicago: Science Research Associates, 1961.
- Educational Research Council. Greater Cleveland mathematics program, 4. Chicago: Science Research Associates, 1964.
- Educational Research Council. Greater Cleveland mathematics program, 5. Chicago: Science Research Associates, 1964.
- Educational Research Council. Greater Cleveland mathematics program, 6. Chicago: Science Research Associates, 1964.
- Eicholz, R. E., O'Daffer, P. G., Brumfiel, C. F., & Shanks, M. E. Elementary school mathematics, 1-6. Reading, Mass.: Addison-Wesley, 1963.
- Eicholz, R. E., O'Daffer, P. G., Brumfiel, C. F., & Shanks, M. E. Elementary school mathematics, 1-6. Menlo Park, Calif.: Addison-Wesley, 1968.
- Elwell, C. E., & Stanislas, Sister M. New ways in numbers, 1-6. Boston: D. C. Heath, 1964.
- Hartung, M. L., Van Engen, H., Knowles, L., & Mahoney, C. Seeing through arithmetic, 1-6. Chicago: Scott, Foresman, 1963.
- Malter, M. S. Ability of children to read cross-sections. Journal of Educational Psychology, 1947, 38, 157-166.
- Malter, M. S. The ability of children to read a process-diagram. Journal of Educational Psychology, 1947, 38, 290-298.

- Malter, M. S. Children's ability to read diagrammatic materials. Elementary School Journal, 1968, 49, 98-102.
- Marsh, L. G. Children explore mathematics. London: A & C Black, 1969.
- McSwain, E. T., Brown, K. E., Gundlach, B. H., & Cooke, R. J. Arithmetic, 1-6. River Forest, Ill.: Laidlaw Brothers, 1963.
- Meadows, G. C. Let's modernize graph teaching. Arithmetic Teacher, 1963, 10, 286-287.
- Morton, R. L., Roskopf, M. F., Moredock, H. S., Gray, M., Sage, E. E., & Collins, W. G. Modern arithmetic through discovery, 1-6. Morristown, N. J.: Silver Burdett, 1963.
- Morton, R. L., Roskopf, M. F., Moredock, H. S., Gray, M., Sage, E. E., & Collins, W. G. Modern mathematics through discovery, 1-6. Morristown, N. J.: Silver Burdett, 1966.
- Nasland, R. A., & McClellan, J. Graph and picture study skills, GP II. Chicago: Science Research Associates, 1961.
- Nichols, E. D., Flournoy, F., Kalin, R., & Simon, L. Elementary mathematics, 1-6. New York: Holt, Rinehart & Winston, 1966.
- Pierson, R. C. Elementary graphing experiences. Arithmetic Teacher, 1969, 16, 199-201.
- Robinson, H. A., Taylor, S. E., & Frackenpohl, H. Study skills library, CC-II. Huntington, N. Y.: Educational Developmental Laboratories, 1961.
- Robinson, H. A., Taylor, S. E., & Frackenpohl, H. Study skills library, CCC-III. Huntington, N. Y.: Educational Developmental Laboratories, 1965.
- Suppes, P. Sets and numbers, 1-6. Syracuse, N. Y.: L. W. Singer, 1966.
- Thomas, K. C. The ability of children to interpret graphs. Thirty-Second Yearbook of the NSSE, 1933, 492-494.
- Thorp, M. T. Studies of the ability of pupils in grades four to eight to use geographic tools. Thirty-Second Yearbook of the NSSE, 1933, 494-506.

Appendix D

Reference: Additional Sources Consulted

- Aldrich, E. V. Using books and libraries. Englewood Cliffs, N.J.: Prentice Hall, 1951.
- Ayres, L. B. Learning the library in grades K-6. Library Journal, 1962, 87, 276, 277.
- Barron, H. Using the dictionary. Education, 1963, 84, 207, 208.
- Bartlett, S. A book to begin on libraries. New York: Holt, Rinehart, and Winston, 1964.
- Boyd, J. E. Books, libraries and you, 3rd Ed. New York: Scribners, 1965.
- Butler, G. E. Using the elementary school library. Education, 1963, 84, 213-216.
- Carpenter, H. M. Developing picture-reading skills. Instructor, 1964, 74, 37-38.
- Cheney, F. N. Using the encyclopedia. Education, 1963, 84, 209-212.
- Cleary, F. D., et al. The effect of a librarian-centered reading guidance program on the reading skills and habits of elementary school pupils, Final Report. U. S. Department of Health, Education, and Welfare, Office of Education, Bureau of Research, August, 1968.
- Cleary, F. D. Blueprints for better reading. New York: H. W. Wilson, 1957.
- Cole, T. Ladder of library skills. Elementary School Journal, 1961, 61, 427-430.
- Cook, M. G. The new library key, 2nd Ed., New York: The H. W. Wilson Co., 1963.
- Cooper, J. L. The reading program spans the total curriculum. Paper presented at the International Reading Association Conference, Seattle (May 4-6, 1967).
- Dobson, M. Stimulating the use of reference materials. Education, 1963, 84, 198-201.
- Donehue, B. K. Use of reference materials in the high school. Education, 1963, 84, 217-220.

- Dorin, A. Instructional program at the high school level. In Problems and practices in New York City Schools, 1967 yearbook of the New York Society for the Experimental Study of Education.
- Flanagan, J. C., Shanner, W. M., & Mager, R. F. Behavioral objectives: A guide to individualizing learning. Palo Alto, Calif.: Westinghouse Learning Press, 1971.
- Gaver, M. V. Five-year report on emerging media centers, Patterns of Development in the Elementary School Library Today, 3rd Edition. Chicago: Encyclopedia Britannica, 1969.
- Gaver, M. V. Every child needs a school library, Pamphlet, American Librarian Assoc., Chicago.
- Gengler, C. R. Developing skills for problem-solving: A study. School Library, 1966, 15, 31-35.
- Graham, C. R. The first book of public libraries. New York: Franklin Watts, 1959.
- Horn, F. D. Study skills: A neglected area. Education, 1961, 81, 521-523.
- Hull, M. Teaching your pupils how to study. Michigan Education Journal, 1969, 46, 16-17.
- Iverson, W. J. The role of the teacher in developing lifetime readers. Paper presented at the International Reading Association Conference, Seattle (May 4-6, 1967).
- Kline, D. F. Developing resource units. Education, 1963, 84, 221-225.
- Krantz, L. L. The relationship of reading abilities and basic skills of the elementary school to success in the interpretation of the content materials in the high school. Journal of Experimental Education, 1957, 26, 197-214.
- Kravits, A. Teaching the essential reading skills in social studies. Paper presented at the International Reading Association Conference, Seattle (May 4-6, 1967).
- Library service: A statement of policy and proposed action by the Regents of the University of the State of New York. Albany: University of the State of New York, State Department of Education, 1970.
- Lodato, A. A new look at library instruction: The supervisor asks some questions. In Problems and practices in New York City schools, 1967 yearbook of the New York Society for the Experimental Study of Education.

- Mager, R. F. Preparing instructional objectives. Belmont, Calif.: Fearon, 1962.
- Mahar, M. H. The school library as a materials center. Washington: U.S. Department of Health, Education, and Welfare, 1963.
- McCord, C. S. Developing an effective reader. Paper presented at the International Reading Association Conference, Seattle (May 4-6, 1967).
- Mott, C., & Baisden, L. The children's book on how to use books and libraries, Rev. Ed. New York: Scribner's, 1961.
- Nemeth, J. S. Reading-study skills in the content areas. Conference on Reading, University of Pittsburgh Reports, 1965, 21, 111-120.
- Perkins, R. The prospective teacher's knowledge of library fundamentals. New York: Scarecrow Press, 1965.
- Raths, L., Jonas, A., Rothstein, A., & Wasserman, S. Teaching for thinking, theory and application. Columbus, Ohio: Charles E. Merrill, 1967.
- Reed, E. Building library skills at the secondary school level. Education, 1968, 88, 353-356.
- Report of the Commissioner of Education's Committee on Library Development. Albany, N.Y.: University of the State of New York, State Education Department, 1970.
- Santa, B. M., & Hardy, L. L. How to use the library. Palo Alto, Calif.: Pacific Books, 1966.
- Sayles, L. Teaching library skills through subject matter. Education, 1966, 86, 412-416.
- School Library Association of California, Northern Section. Library skills: Teaching library use through games and devices. Belmont, Calif.: Fearon, 1958.
- Schwilk, G. L. Million dollar carrels. Library Journal, 1967, 92, 306-308.
- Sealoff, G. Library instruction to fit the times. School Library, 1958, 7, 18-19.
- Serck, L. M. We learn about the library. Grade Teacher, 1960, 78, 102-104.
- Shor, P. Libraries and you. Englewood Cliff, N.J.: Prentice Hall, 1964.
- Shores, L. The other half--Where to find it. Education, 1963, 84, 202-206.
- Shufro, H. P. A workshop project on using the elementary school library. Instructor, 1965, 74, 98.

Spain, C. R. Reference materials in the modern school. Education, 1963, 84, 195-198.

Standards for School Media Programs. Prepared by the American Association of School Librarians, and Department of Audio Visual Instruction of National Education Association, American Library Association. Washington: National Education Association, 1969.

Stauffer, R. G. Directing reading maturity as a cognitive process. New York: Harper & Row, 1969.

Stauffer, R. G. Teaching reading as a thinking process. New York: Harper & Row, 1969.

Taylor, M., & Liebold, K. Libraries are for children. New York: Fordham University Press, 1965.

Toser, M. Library manual: A study-work manual of lessons on the use of books and libraries, 6th Ed. New York: H. W. Wilson, 1964.

Trinker, C. L. (Ed.) Better libraries make better schools. Contributions to Library Literature No. 4. New York: Shoestring Press, 1962.

Whitney, D. C. The first book of facts and how to find them. New York: Franklin Watts, 1966.

Weiman, R. F. Library instruction at JHS level. In Problems and practices in New York City schools, 1967 yearbook of the Society for the Experimental Study of Education.

Veatch, J. Individualizing your reading program. New York: Putnam, 1959.

Appendix E
Outline of Study Skills

LEVEL A

1. Describes positions of objects^{11*}
2. Has measurement skills
 - a. Describes relative size²¹
 - b. Determines relative distance³¹
3. Has beginning work study skills
 - a. Follows simple directions⁴¹
 - b. Is able to remember details⁵¹
 - c. Has attention and concentration span suitable for his ability⁶¹
 - d. Has beginning of independent work habits⁷¹
4. Has basic book handling skills⁸¹
5. Is familiar with procedures within library⁹¹
(book table, book corner, learning center, instructional materials center, or media center)*

LEVEL B

1. Identifies representational relationships¹¹
2. Has location skills
 - a. Locates objects in relation to other objects²
 - b. Locates points in relation to a simple picture grid³
3. Has measurement skills
 - a. Describes relative size⁴
 - b. Determines relative distance⁵

* NOTE. We have selected "LIBRARY" as a descriptive term for whatever facilities are available to the child for finding either books or audio-visual learning aids.

4. Interprets picture graphs⁶
5. Interprets single-column tables⁷
6. Refines beginning work study skills
 - a. Follows oral directions given to a group⁸
 - b. Follows oral directions given individually⁹
 - c. Follows written directions¹⁰
7. Begins locational skills (letters and digits)¹¹
8. Expands book skills¹²
9. Expands use of the library¹³
10. Uses a picture dictionary for spelling new words¹⁴
11. Begins to organize materials for his own use
 - a. Arranges pictures and words in sequence¹⁵
 - b. Classifies ideas¹⁶

LEVEL C

1. Has representation skills
 - a. Uses picture symbols to interpret maps¹
 - b. Uses semipictorial symbols to interpret maps²
 - c. Uses color key to interpret maps³
2. Has location skills
 - a. Locates points in relation to a simple grid⁴
 - b. Indicates cardinal directions on a globe⁵
3. Has measurement skills
 - a. Interprets relative size⁶
 - b. Expresses relative distance⁷
4. Has graph skills
 - a. Picture graphs⁸
 - b. Bar graphs⁹

5. Interprets multicolumn tables¹⁰
6. Shows increasing independence in work¹¹
7. Groups and orders words by initial letter¹²
8. Expands book skills¹³
9. Expands use of library¹⁴
10. Begins to use reference materials¹⁵
11. Reads to find answers: Takes notes¹⁶
12. Organizes and evaluates materials
 - a. Keeps simple reading record¹⁷
 - b. Recognizes organization of ideas in sequential order¹⁸
 - c. Begins to make judgments and draw conclusions¹⁹

LEVEL D

1. Has representation skills
 - a. Uses a key containing nonpictorial symbols to interpret maps¹
 - b. Uses a color key to interpret maps²
2. Has location skills
 - a. Locates points on a number-letter grid³
 - b. Determines cardinal directions on globes, in his environment, and maps⁴
3. Uses scale to determine whole units of distance⁵
4. Has graph skills
 - a. Picture graphs⁶
 - b. Bar graphs⁷
 - c. Circle graphs⁸
5. Interprets multicolumn tables⁹

6. Has independent classroom and research work habits
 - a. Follows oral or written directions independently¹⁰¹
 - b. Begins to do research assignments independently¹¹¹
7. Expands locational skills
 - a. Applies basic alphabetizing skills¹²¹
 - b. Uses guide words in encyclopedias and dictionaries¹³
 - c. Uses SEE references in encyclopedias¹⁴
8. Expands book skills
 - a. Uses table of contents¹⁵
 - b. Uses glossary¹⁶¹
 - c. Begins to use indexes¹⁷
 - d. Uses study aids in textbooks¹⁸¹
9. Expands use of library¹⁹¹
10. Begins to expand use of reference materials²⁰¹
11. Reads to locate information
 - a. Begins to adjust reading rate²¹¹
 - b. Uses headings and subheadings²²
12. Organizes and evaluates materials
 - a. Recognizes printed statements may be fact or opinion²³¹
 - b. Evaluates relevance of materials²⁴
 - c. Checks accuracy of statements²⁵

LEVEL E

1. Uses point and line symbols to interpret maps¹
2. Has location skills
 - a. Applies rectangular grid to earth sphere²
 - b. Determines intermediate directions on globes, in the environment, and on maps³

3. Makes limited use of scale to determine distance⁴
4. Has graph skills
 - a. Picture graphs⁵
 - b. Bar graphs⁶
5. Interprets multicolumn tables⁷
6. Has independent classroom and research work habits⁸ⁱ
7. Expands locational skills
 - a. Utilizes alphabetical system⁹
 - b. Uses guide words and guide letters¹⁰
 - c. Uses alphabet skills related to card catalog¹¹
8. Expands book skills
 - a. Refines use of indexes¹²
 - b. Considers special features of books in selection¹³ⁱ
9. Extends familiarity with library¹⁴
10. Expands use of reference materials
 - a. Uses dictionaries independently¹⁵
 - b. Consults encyclopedias and atlases¹⁶ⁱ
 - c. Uses pamphlet files¹⁷ⁱ
 - d. Uses magazines and newspapers¹⁸ⁱ
 - e. Uses selected specialized reference books¹⁹
 - f. Uses non-fiction materials as references²⁰ⁱ
11. Adjusts reading rate to:
 - a. Difficulty²¹ⁱ
 - b. Purpose²²ⁱ
12. Organizes and evaluates materials
 - a. Has beginning outlining skills²³

- b. Makes simple bibliographies²⁴¹
- c. Draws inferences and makes generalizations²⁵
- d. Evaluates information in terms of his own experience and/or known facts²⁶¹

LEVEL F

- 1. Uses point, line and area symbols¹
- 2. Has location skills²
- 3. Has measurement skills
 - a. Identifies differences among maps drawn to different scales, e.g., 1" = 1000 miles, 1" = 100 miles, and 1" = 50 miles³
 - b. Makes use of scale to determine distance⁴
- 4. Has graph skills
 - a. Bar graphs⁵
 - b. Circle graphs⁶
 - c. Line graphs⁷
- 5. Interprets schedules⁸
- 6. Has independent classroom and research work habits⁹¹
- 7. Increases locational facility
 - a. Refines card catalog skills¹⁰
 - b. Refines cross reference skills¹¹
- 8. Expands book skills¹²¹
- 9. Expands facility in using library¹³
- 10. Expands use of reference materials
 - a. Uses dictionaries for pronunciation¹⁴
 - b. Uses "SEE ALSO" direction¹⁵
 - c. Uses Subject Index to Children's Magazines¹⁶

11. Adjusts reading rate to:
 - a. Difficulty¹⁷¹
 - b. Purpose¹⁸¹
12. Organizes and evaluates materials
 - a. Makes notes of main ideas and supporting facts¹⁹
 - b. Summarizes materials²⁰¹

LEVEL G

1. Has representation skills
 - a. Identifies likenesses and differences between two or more areas
 - b. Synthesizes information about an area²
2. Uses meridians and parallels to determine directions on any projection³
3. Has measurement skills
 - a. Locates the same point or cell on various projections⁴
 - b. Uses inset maps to determine relative size of areas⁵
4. Has graph skills
 - a. Bar graphs⁶
 - b. Line graphs⁷
5. Interprets schedules⁸
6. Has independent classroom and research work habits⁹¹
7. Refines book skills¹⁰¹
8. Increases facility in using library
 - a. Uses all information on catalog cards¹¹
 - b. Increases understanding of Dewey System¹²
9. Expands use of reference materials: current periodical indexes¹³

10. Adjusts reading rate to:

a. Difficulty¹⁴¹

b. Purpose¹⁵¹

11. Organizes and evaluates materials

a. Gains skill in note taking¹⁶¹

b. Makes formal outlines¹⁷

Appendix F
Study Skills Objectives

LEVEL A

1. Describes positions of objects ^{11*}



OBJECTIVE

The child is able to describe the position of objects in his environment in relation to himself by using the following terms: up-down, on, between, near (beside), behind-in front of (front-back), below-above (over-under).

2. Has measurement skills



- a. Describes relative size ²¹

OBJECTIVE

The child is able to use descriptive terms (e.g., bigger-smaller, taller-shorter, lower-higher) to express comparisons of size of objects in his environment.

- b. Determines relative distance ³¹

OBJECTIVE

The child is able to use descriptive terms (e.g., closer-farther, long way-short way) to express comparisons of distance in his environment.

*Indicates skill number

Level A (cont.)

3. Has beginning work study skills



a. Follows simple directions⁴¹

OBJECTIVE

The child is able to perform the actions in simple one- and two-stage directions, e.g., "Mark an X in the middle of your paper," "Please come and take one of these boxes of paper shapes to your work area."

b. Is able to remember details⁵¹

OBJECTIVE

The child is able to remember sufficient details (a) from an oral presentation--i.e., story, show-and-tell--to respond to specific questions, e.g., four questions regarding specific facts based upon a 100-word presentation and/or (b) from an event he is describing to give an intelligible account of what happened.

c. Has attention and concentration span suitable for his ability⁶¹

OBJECTIVE

The child is able to demonstrate active participation in classroom listening situations. [The child attends to an oral presentation and responds appropriately, i.e., follows directions, reacts with relevant questions, and/or contributions.]

NOTE: Assessment is best carried out over a span of time during which the child can be observed in a variety of situations and his behavior compared to that of his age/grade group.

- d. Has beginning of independent work habits⁷¹

OBJECTIVE

The child shows independence in his assigned work by (a) asking questions that are necessary for clarification of the task, (b) not asking attention-seeking questions once the task is clear, (c) keeping the necessary tools--i.e., pencil, paper, crayons, scissors, etc.--at hand, (d) accepting responsibility for completion and quality of work, and (e) pacing himself to complete a task acceptably in the allotted time (5-10 minutes.)

NOTE: The preceding objective must be assessed by observing the child over a period of time. Special note should be made of the child who does neat work but only at the expense of extended, painstaking effort.

4. Has basic book handling skills⁸¹



OBJECTIVE

The child demonstrates basic book skills by (a) selecting books appropriate to his interests and ability level, (b) handling books reasonably (i.e., right-side-up, from front to back), and (c) referring to books by their main character or subject (e.g., "The book about the butterfly").

5. Is familiar with procedures within the library⁹¹
(book table, book corner, learning center, instructional materials center, or media center)*



OBJECTIVE

The child (a) locates groups of books appropriate to his needs, and (b) is able to check books in and out.

*NOTE. We have selected "LIBRARY"--as a descriptive term for whatever facilities are available to the child for finding either books or audio-visual learning aids.

Level B

LEVEL B

1. Identifies representational relationships ¹¹



OBJECTIVE

The child is able to place three-dimensional representations of objects to reflect their actual locations in the environment, e.g., place blocks that represent houses on a large floor map, build models in a sand box.

2. Has location skills



a. Locates objects in relation to other objects ²

OBJECTIVE

The child is able to describe or respond to descriptions of the positions of objects and representations of objects in relation to other objects and representations in the following terms: right-left, up-down, on, between, near (beside), behind-in front of (back-front), below-above (over-under).

b. Locates points in relation to a simple picture grid ³

OBJECTIVE

Given axis and coordinate referents the child is able to locate points and describe the location of points in relation to a simple picture grid.

3. Has measurement skills



a. Describes relative size ⁴

OBJECTIVE

The child is able to use descriptive terms (e.g., bigger-smaller, taller-shorter, lower-higher) to express comparisons of size of representations of objects (e.g., scale models, pictures).

- b. Determines relative distance⁵

OBJECTIVE

The child is able to use descriptive terms (e.g., closer-farther, long way-short way) to express comparisons of distance in representations of objects (e.g., sand box, pictures).

4. Interprets picture graphs⁶



OBJECTIVE

Given a simple vertical picture graph in which each symbol represents a single object and there are no more than three to five columns of pictures, the child is able to

- | | |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. determine the purpose | [surmise the objective of the presentation by considering all parts of the graph (title, dimensions, nature of content), e.g., the child determines that a graph shows the number of trucks that each of three children have] |
| b. compare relative amounts | [use descriptive terms (i.e., most, fewest or least, more, fewer or less, largest, smallest), not exact numbers to express comparisons of amounts on graphs] |
| c. extract directly | [sum, by counting, the units in a particular column] |

Level B (cont.)

5. Interprets single-column tables⁷



OBJECTIVE

Given a single-column table with from three to five rows the child is able to

- a. determine the purpose [surmise the objective of the presentation by considering all parts of the table (title, dimensions, nature of content), e.g., the child determines that a table shows the number of trucks that each of three children have]
- b. locate a cell [find the point of intersection of a specified row and a specified column and derive information from it]
- c. compare relative amounts [use descriptive terms (e.g., most, fewest or least, more, fewer or less, largest, smallest) to compare the quantities designated by two or more cell entries]

6. Refines beginning work study skills



- a. Follows oral directions given to a group⁸

OBJECTIVE

The child is able to follow two-stage oral directions when the directions are administered to a group--i.e., 10 or more pupils--of which the child is a part.

- b. Follows oral directions given individually⁹¹

OBJECTIVE

The child is able to perform the actions in two-stage directions that require some judgment when the directions are given directly to him.

NOTE: The two preceding objectives can best be assessed by observing the child's performance over a period of time, for contrived situations

are likely not only to have an aura of contrivance but also to be of too short duration to be very meaningful. Special note should be made of the child who responds adequately with individual attention but not in a group, or, conversely, who can take cues from the group and proceed satisfactorily but breaks down when left to himself.

c. Follows written directions¹⁰

OBJECTIVE

The child is able to follow a series of three to four brief written directions.

7. Begins locational skills (letters and digits)¹¹



OBJECTIVE

The child is able (a) to indicate the correct symbol when letters and digits are presented orally, and (b) to match capital and other allographs of one letter.

8. Expands book skills¹²¹



OBJECTIVE

The child demonstrates expanded book skills by (a) continuing to select appropriate books, and (b) beginning to identify books by their titles, and (c) using the Table of Contents page in textbooks.

9. Expands use of the library¹³¹



OBJECTIVE

The child demonstrates expanded use of the library by (a) using more materials, such as picture dictionaries, (b) asking for help in finding books about a specific subject, (c) continuing to observe local rules, and (d) attempting to apply other skills, i.e., the child may try to locate a book in the card catalog by title; see objective B 8.b.

Level B (cont.)
Level C

10. Uses a picture dictionary for spelling new words¹⁴¹



OBJECTIVE

The child is sufficiently familiar with a picture dictionary to check the spelling of words he uses in writing.

11. Begins to organize materials for his own use



- a. Arranges pictures and words in sequence¹⁵

OBJECTIVE

The child can re-create the sequence of a story or event by arranging pictures or by arranging key words in order (e.g., The Three Bears: "hot - bears walk - Goldilocks - breakfast - chairs - beds - bears come home").

- b. Classifies ideas¹⁶

OBJECTIVE

Given five ideas or facts, the child is able to determine which are relevant to a given topic.

LEVEL C



1. Has representation skills



NOTE: The concept that underlies these subskills is of prime importance: symbols are arbitrary. The sequence here goes from pictorial to semipictorial to nonpictorial. Thus, the development moves from realistic representations of concrete objects to abstract representations of objects.

- a. Uses picture symbols to interpret maps¹

OBJECTIVE

The child is able to use realistic pictures (e.g.,  ) to derive information from maps.

- b. Uses semipictorial symbols to interpret maps²

OBJECTIVE

The child is able to use semipictorial symbols (e.g., ↑ ♂) which are explained in a key (legend) to derive information from maps.

- c. Uses color key to interpret maps³

OBJECTIVE

The child is able to use distinct colors (e.g., brown, red, yellow and blue) which are explained in a key to derive qualitative information from different maps, e.g., blue may denote water, grocery stores or parks on different maps.

2. Has location skills



- a. Locates points in relation to a simple grid⁴

OBJECTIVE

The child is able to locate points and describe the location of points in relation to a simple street grid.

- b. Indicates cardinal directions on a globe⁵

OBJECTIVE

The child is able to indicate on a globe (a) north and south with reference to the North Pole, South Pole, and equator, and (b) east and west with reference to north-south.

3. Has measurement skills



- a. Interprets relative size⁶

OBJECTIVE

The child is able to interpret the relative size of areas in semipictorial maps, e.g., lakes, parks, forests.

Level C (cont.)

b. Expresses relative distance⁷

OBJECTIVE

The child is able to use familiar nonstandard units of measurement (e.g., blocks, houses) to express distance and comparisons of distance on semipictorial maps.

4. Has graph skills



a. Picture graphs⁸

OBJECTIVE

Given a horizontal picture graph in which each symbol represents more than one unit (i.e., 2 to 10), the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [note the number of units represented by the whole symbol, and then arrive at the total number of units in a particular row]
- 4) determine differences between numbers extracted [compare, by addition and/or subtraction, the exact amounts represented in given rows]

b. Bar graphs⁹

OBJECTIVE

Given a vertical bar graph which has one group of bars and a small interval on the coordinate (i.e., 2 to 10), the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]

- 3) extract directly [note the line to which a particular bar comes and read the number beside the line]

5. Interprets multicolumn tables¹⁰



OBJECTIVE

Given a simple, multicolumn table with from two to four rows and columns the child is able to

- a. determine the purpose [see B 5.a.]
- b. locate a cell [see B 5.b.]
- c. compare relative amounts in a single dimension [use descriptive terms (e.g., most, fewest or least, more, fewer or less, largest, smallest) to compare the quantities designated by two or more cell entries in a given row or column]
- d. determine relationships among cells [report the difference among two or more specified cells]

6. Shows increasing independence in work¹¹



OBJECTIVE

The child shows independence and acceptance of responsibility by (a) asking the questions required to clarify a task, (b) keeping the materials required to complete a task available and organized, (c) showing an awareness of a standard for general quality in assigned work, and (d) pacing himself to complete assigned tasks in the time allotted (30 minutes).

7. Groups and orders words by initial letter¹²



OBJECTIVE

The child is able to alphabetize words by attending to the initial letter only.

Level C (cont.)

8. Expands book skills¹³



OBJECTIVE

The child demonstrates expanded book skills by (a) identifying books by their titles, (b) finding the title page in a book, (c) associating authors with books, (d) finding the author's name on the title page, (e) locating the table of contents in a book, and (f) locating the index in a book.

9. Expands use of library¹⁴¹



OBJECTIVE

The child is able (a) to find easy books for independent reading, (b) to locate fiction books by author's last name, (c) to locate non-fiction books, encyclopedias and dictionaries, and (d) to ask for assistance in using card catalog to apply skills C 8.a and d.

10. Begins to use reference materials¹⁵¹



OBJECTIVE

The child is able to (a) select pictures appropriate to a given topic from a picture file, (b) differentiate in his use of encyclopedias and dictionaries, (c) use encyclopedias for browsing, and (d) use some non-fiction materials as authoritative sources.

11. Reads to find answers: Takes notes¹⁶



OBJECTIVE

The child is able to read to find answers to direct questions, take simple notes to answer the questions, and use the notes to answer the questions at a later time. (2-3 days)

12. Organizes and evaluates materials

- a. Keeps simple reading record¹⁷¹

OBJECTIVE

The child lists the titles of books consulted with reference to a given topic.

- b. Recognizes organization of ideas in sequential order¹⁸

OBJECTIVE

The child is able to recognize sequential relationships among two or three ideas.

- c. Begins to make judgments and draw conclusions¹⁹

OBJECTIVE

Given facts, the child is able to respond correctly to questions requiring that he make judgments and draw conclusions on the basis of the facts presented.

LEVEL D

1. Has representation skills



- a. Uses a key containing nonpictorial symbols to interpret maps¹

OBJECTIVE

The child is able to use a key containing nonpictorial symbols (e.g., lines, dots) to derive information from maps.

- b. Uses a color key to interpret maps²

OBJECTIVE

The child is able to use a color key, in which colors identify classes and no more than three shades of any color identify subclasses, to derive information from maps, e.g., the child reports that there are two areas of marshland (light blue) and one area of swamp (dark blue).

Level D (cont.)

2. Has location skills



- a. Locates points on a number-letter grid³

OBJECTIVE

The child is able to locate points and describe the location of points on a number-letter grid.

- b. Determines cardinal directions on globes, in his environment, and maps⁴


OBJECTIVE

The child is able to (a) determine cardinal directions to describe relative location of two points on globes, in his environment, and on maps, and (b) relate the location of points on globes and maps to the location of points in the environment, e.g., the child matches objects pictured on a map with objects in his environment to determine direction.

3. Uses scale to determine whole units of distance⁵



OBJECTIVE

The child is able to use a scale bar referent or verbal referent (i.e., 1 inch = X standard units of measure) to compare and determine distances between points (a) one or more referent units apart when one referent unit equals one standard unit of measure (e.g., 1 inch = 1 mile,  = 1 mile), and (b) one referent unit apart when one referent unit equals more than one standard unit of measure (e.g., 1 inch = 20 miles).

4. Has graph skills



a. Picture graphs⁶

OBJECTIVE

Given a picture graph in which each symbol represents more than one unit (e.g., 2, 10, 20), the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see C 4.a.3)]
- 4) determine differences between numbers extracted [see C 4.a.4)]
- 5) make a summary statement [summarize all of the data presented, e.g., from a graph showing the number of ships built in various countries, the child concludes that one country is the major source of production]

b. Bar graphs⁷

OBJECTIVE

Given a horizontal or vertical bar graph which has one group of bars and a small interval (e.g., 2, 10, 20), the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see C 4.b.3)]

Level D (cont.)

- | | |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 4) determine differences between numbers extracted | [compare, by addition and/or subtraction, the exact amounts represented by given horizontal or vertical bars] |
| 5) make a summary statement | [see D 4.a.5)] |

c. Circle graphs⁸

OBJECTIVE

Given a circle graph with from two to four divisions the child is able to

- | | |
|-----------------------------|--------------|
| 1) determine the purpose | [see B 4.a.] |
| 2) compare relative amounts | [see B 4.b.] |

5. Interprets multicolumn tables⁹



OBJECTIVE

Given a multicolumn table with from five to eight rows and columns, familiar units for denominate numbers (explained in a key), and/or totals included for each column and row, the child is able to

- | | |
|---------------------------------------------------|------------------------------------------------------------------------------------------|
| a. determine the purpose | [see B 5.a.] |
| b. locate a cell | [see B 5.b.] |
| c. compare relative amounts in a single dimension | [see C 5.c.] |
| d. determine relationships among cells | [report the difference or multiplicative relationship among two or more specified cells] |

- e. make a summary statement [summarize all of the data presented, e.g., on a table showing the number of ships built in various countries during each of ten consecutive years, the child concludes that one country is the major source of production for one particular year, while another country is the major source of overall production]

6. Has independent classroom and research work habits



- a. Follows oral or written directions independently¹⁰¹

OBJECTIVE

The child is able to (a) remember and follow a series of directions in sequence, and (b) generalize from directions for one task to a similar task.

- b. Begins to do research assignments independently¹¹¹

OBJECTIVE

The child shows independence or acceptance of responsibility by (a) working independently on assigned projects, and (b) pacing himself to complete long term tasks in the time allotted (1 week).

7. Expands locational skills



- a. Applies basic alphabetizing skills

12

OBJECTIVE

The child is able to alphabetize words by attending to the first and second letters.

Level D (cont.)

- b. Uses guide words in encyclopedias and dictionaries¹³

OBJECTIVE

The child is able to locate the appropriate alphabetical section of a reference book for a given topic or target word by attending to the alphabetic sequence of guide words.

- c. Uses SEE references in encyclopedias¹⁴

OBJECTIVE

The child locates the topic referred in response to a SEE reference, (e.g., Having located "Plain Indians. See Indian, American," the child locates the topic referred.)

8. Expands book skills



- a. Uses table of contents¹⁵

OBJECTIVE

The child refers to the table of contents to (a) determine if a book is relevant to his specific purpose (e.g., interest, research topic), and/or (b) locate a particular chapter or section in a book.

- b. Uses glossary¹⁶

OBJECTIVE

The child locates and uses the glossary in a book, rather than a dictionary, to look up the meaning(s) of words as they are used in the context of the book (i.e., he finds new meanings for familiar words and unfamiliar words as they are used in a given context or subject matter area).

- c. Begins to use indexes¹⁷

OBJECTIVE

Having identified a general topic, the child uses the indexes of books to locate information about the topic.

- d. Uses study aids in textbooks¹⁸¹

OBJECTIVE

The child finds and uses such study aids as boldface type, italics, and/or marginal notes in using textbooks.

9. Expands use of library¹⁹¹



OBJECTIVE

The child (a) is able to locate magazines and some non-fiction books relevant to his interests and assigned work, and (b) continues to attempt higher level skills such as using card catalog with assistance of librarian.

10. Begins to expand use of reference materials²⁰¹



OBJECTIVE

The child will independently seek additional reference sources (a) if the source first consulted does not give sufficient information, and/or (b) pursue interest aroused by initial stimulation (e.g., having found a picture of an igloo in the dictionary, the child consults the encyclopedia to learn about the construction of igloos).

NOTE: Encyclopedias are considered an important beginning reference material. Teachers should check that they are being used to check facts, and as a beginning source, and not as sources for complete reports, verbatim from encyclopedias.

Level D (cont.)

11. Reads to locate information



- a. Begins to adjust reading rate ²¹¹

OBJECTIVE

The child skims materials at a rapid rate when seeking to verify or locate specific information, i.e., a date, a name.

- b. Uses headings and subheadings ²²

OBJECTIVE

Having located a topic in a reference book, the child utilizes the organization of the material to search efficiently for target information.

12. Organizes and evaluates materials



- a. Recognizes printed statements may be fact or opinion ²³¹

OBJECTIVE

The child is able to make a considered decision as to whether given statements represent fact or opinion.

- b. Evaluates relevance of materials ²⁴

OBJECTIVE

Given an assigned list of topics, the child is able to choose from among available sources those that are likely to include relevant information on specific topics.

Level D (cont.)

Level E

- c. Checks accuracy of statements²⁵

OBJECTIVE

The child is able to identify discrepancies between simple factual data from two sources, e.g., number of parks in a city.

NOTE: When children identify these discrepancies through classroom research, they then should be directed to discover why two sources provided different answers; e.g. ---is it their error in note-taking; is one source out of date; are the graphs, tables, etc., consulted labeled differently?

Level E

1. Uses point and line symbols to interpret maps¹



OBJECTIVE

The child is able to use point and line symbols (e.g., circles of different sizes, lines of different widths) to derive qualitative and quantitative information from maps; e.g., the child identifies the largest city on a map as the one represented by the largest circle.

2. Has location skills



- a. Applies rectangular grid to earth sphere²

OBJECTIVE

The child is able to use (a) lines of latitude as referents for describing general locations (e.g., north of equator) and (b) lines of longitude as referents for describing general locations (e.g., west of Prime Meridian).

Level E (cont.)

- b. Determines intermediate directions on globes, in the environment, and on maps³

OBJECTIVE

The child is able to (a) determine intermediate directions to describe relative location of two points on globes, in his environment, and on maps, and (b) relate the location of points on globes and maps to the location of points in the environment; e.g., the child matches objects pictured on a map with objects in his environment to determine direction.

3. Makes limited use of scale to determine distance⁴



OBJECTIVE

The child is able to use a scale bar referent or verbal referent (i.e., 1 inch = X standard units of measure) to compare and determine distances between points one or more referent units apart when one referent unit equals two or more standard units of measure; e.g., when 1 inch = 3 miles, the child concludes that 3 inches = 9 miles.

4. Has graph skills



- a. Picture graphs⁵

OBJECTIVE

Given a picture graph in which (a) each symbol represents more than one unit (e.g., 2, 10, 20) and (b) half symbols are used, the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see C 4.a.3)]

Level E (cont.)

- | | |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4) extract by interpolating | [determine appropriate numbers not expressed in whole symbols, e.g., the child determines the number depicted by a partial symbol] |
| 5) determine differences between numbers extracted | [see C 4.a.4)] |
| 6) make a summary statement | [see D 4.a.5)] |
| 7) make projections and relate information | [state probable outcomes or trends (e.g., having observed a trend shown on a graph, the child predicts future performance) and relate the information presented and the projections derived to his previous knowledge] |

b. Bar graphs⁶

OBJECTIVE

Given a horizontal or vertical bar graph which has one group of bars and a small interval (e.g., 10, 20) the child is able to

- | | |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) determine the purpose | [see B 4.a.] |
| 2) compare relative amounts | [see B 4.b.] |
| 3) extract directly | [note the line to which a particular bar comes, and then (a) read the number beside the line or (b) note the particular tick mark beside the bar and determine the correct amount (e.g., given an interval of 10, the child reports that a bar at the seventh tick mark between 10 and 20 represents 17 units)] |
| 4) extract by interpolating | [determine the appropriate amount represented by a bar "between the lines"] |

Level E (cont.)

- 5) determine differences between numbers extracted [see D 4.b.4)]
- 6) make a summary statement [see D 4.a.5)]
- 7) make projections and relate information [see E 4.a.7)]

5. Interprets multicolumn tables⁷



OBJECTIVE

Given a complex multicolumn table with denominate numbers (explained in a key or the title), and/or totals included for each column and row, the child is able to

- a. determine the purpose [see B 5.a.]
- b. locate a cell [see B 5.b.]
- c. compare relative amounts in a single dimension [see C 5.c.]
- d. determine relationships among cells [see D 5.d.]
- e. make a summary statement [see D 5.e.]
- f. make projections and relate information [state probable outcomes or trends (e.g., having observed a trend shown on a table, the child predicts future performance) and relate the information presented and the projections derived to his previous knowledge]

6. Has independent classroom and research work habits⁸¹



OBJECTIVE

The child is able to focus all previously mastered study skills in independent study and/or research.

NOTE: The child should demonstrate ability to direct his own independent inquiry; e.g., pursue special interests related to assigned tasks, initiate independent projects.

7. Expands locational skills



- a. Utilizes alphabetical system⁹

OBJECTIVE

The child is able to alphabetize words.

- b. Uses guide words and guide letters¹⁰

OBJECTIVE

Given (a) the guide words and page numbers from three to six pages, in a reference book, the child is able to specify the page on which specific words could be found, and/or (b) the guide letters and drawer numbers of a card catalog, the child is able to specify the drawer in which specific words, names, or topics could be found.

- c. Uses alphabet skills related to card catalog¹¹

OBJECTIVE

For locating information in the card catalog, the child (a) uses guide cards in the drawers to locate his target word quickly, and (b) ignores initial articles.

Level E (cont.)

8. Expands book skills



a. Refines use of indexes¹²

OBJECTIVE

Having identified, or given a general topic, the child uses the indexes of books or the index volume of an encyclopedia to locate specific information regarding subtopics, e.g., SPACE, Space travel: development of flight plan, history of.

b. Considers special features of books in selection¹³¹

OBJECTIVE

The child examines books to judge their relevance to his purposes.

NOTE: The child considers such questions as: does the book include relevant pictures, maps, graphs, tools, etc? Does a general text include information on a given topic?

9. Extends familiarity with library¹⁴



OBJECTIVE

The child is able to (a) locate and identify author, subject, and title cards in the card catalog, and (b) use them to locate books and other materials.

NOTE: Included among other materials are such things as games, film strips, films, records, photographic equipment, etc., which may be found in a well stocked library. In the present context, emphasis is placed on books.

10. Expands use of reference materials



- a. Uses dictionaries independently¹⁵

OBJECTIVE

The child uses dictionaries to check the spelling and/or meaning of words as needed.

- b. Consults encyclopedias and atlases¹⁶¹

OBJECTIVE

The child locates (a) information on one topical heading in more than one encyclopedia by adapting his locational skills to the idiosyncrasies of each set (e.g., some have individual volume indexes, some have no indexes, some have a multivolume index), and (b) maps in atlases.

- c. Uses pamphlet files¹⁷¹

OBJECTIVE

The child routinely includes the pamphlet file in a check for material available on a subject.

- d. Uses magazines and newspapers¹⁸¹

OBJECTIVE

The child selects magazines and newspapers as sources of current topical information.

- e. Uses selected specialized reference books¹⁹

OBJECTIVE

The child selects (a) World Almanac and/or Information Please Almanac, or (b) Junior Book of Authors, or (c) a dictionary, or (d) an encyclopedia, or (e) an atlas, or (f) a non-fiction book, whichever is most appropriate to answer specific questions.

Note: The child should select the World Almanac to find demographic information, dates; a dictionary for word meaning; an encyclopedia for general background; Junior Book of Authors for biographical information about a children's author, etc.

Level E (cont.)

- f. Uses non-fiction materials as references²⁰¹

OBJECTIVE

The child chooses non-fiction books and materials not formally designated "Reference" when appropriate.

11. Adjusts reading rate to:



- a. Difficulty²¹¹

OBJECTIVE

The child adjusts his reading rate appropriately as reading materials become more or less difficult. [The child reads a given type of material--e.g., science material--written at his independent reading level of difficulty at a more rapid rate (greater number of words per minute) than similar material written at his instructional level of reading difficulty.]

- b. Purpose²²¹

OBJECTIVE

The child skims materials at a rapid rate when seeking to verify or locate specific information; he reads material at a lower but rapid rate when seeking an overview or general idea regarding content; and he scans material at a relatively slow rate when his purpose is to master or locate to verify and recall factual information.

12. Organizes and evaluates materials



- a. Has beginning outlining skills²³

OBJECTIVE

Given the major points in a formal outline the child is able to select and fill in second-order points from well organized paragraphs written at his instructional level of difficulty, e.g.,

- I. Birds are alike in many ways
 - A.
 - B.
 - C.
 - D.
- II. A bird's feathers are useful
 - A.
 - B.
 - C.

- b. Makes simple bibliographies²⁴¹

OBJECTIVE

The child lists books he has consulted by author and title.

- c. Draws inferences and makes generalizations²⁵

OBJECTIVE

Given facts, the child is able to respond correctly to questions requiring that he make inferences and make generalizations on the basis of the facts presented.

- d. Evaluates information in terms of his own experience and/or known facts²⁶¹

OBJECTIVE

The child relates new information to his personal experiences and/or known facts, and evaluates both new information and the past experiences and knowledge in terms of the relationship.

NOTE: Assessment of this objective is most realistically based on observations over a period of time. One basis for assessment would be observations of reactions to commercial advertisements of products with which the child has had experience: The child should be able not only to criticize in terms of his personal experience but also to re-evaluate his past observations in light of new information, e.g., note when a product had been inappropriately used, recognize unrealistic expectations.

Level F

LEVEL F

1. Uses point, line and area symbols¹



OBJECTIVE

The child is able to use point, line and area symbols to derive qualitative and quantitative information from maps.

2. Has location skills²



OBJECTIVE

The child is able to use lines of latitude and longitude to locate points on a map or globe; e.g., New York City is 40° north latitude and 74° west longitude.

3. Has measurement skills



- a. Identifies differences among maps drawn to different scales, e.g., 1" = 1000 miles, 1" = 100 miles, and 1" = 50 miles³

OBJECTIVE

The child is able to identify differences (e.g., amount of detail) among maps of the same area drawn to different scales, e.g., 1" = 1000 miles, 1" = 100 miles, and 1" = 50 miles.

- b. Makes use of scale to determine distance⁴

OBJECTIVE

The child is able to use a scale bar referent or verbal referent (i.e., 1 inch = X standard units of measure) to compare and determine distances between points that are combinations of fractional and whole referent units apart when one referent unit equals two or more standard units of measure; e.g., when 1 inch = 10 miles, the child concludes that 2 1/2 inches = 25 miles.

4. Has graph skills



a. Bar graphs⁵

OBJECTIVE

Given a horizontal or vertical bar graph which has two groups of bars, the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see E 4.b.3)]
- 4) extract by interpolating [see E 4.b.4)]
- 5) determine differences between numbers extracted [compare, by addition, subtraction, multiplication, and/or division pairs of numbers extracted]
- 6) make a summary statement [see D 4.a.5)]
- 7) make projections and relate information [see E 4.a.7)]

b. Circle graphs⁶

OBJECTIVE

Given a circle graph with four or more divisions, the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]

Level F (cont.)

- 3) extract directly [read indicated amounts]
- 4) make a summary statement [see D 4.a.5)]

c. Line graphs⁷

OBJECTIVE

Given a single line, noncumulative line graph, the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [note where a point on a line falls with respect to axis and coordinate referents]
- 4) extract by interpolating [note where a point on a line falls with respect to axis and coordinate referents]
- 5) determine differences between numbers extracted [see F 4.b.5)]
- 6) make a summary statement [see D 4.a.5)]
- 7) make projections and relate information [see E 4.a.7)]

5. Interprets schedules⁸



OBJECTIVE

Given a simple schedule (e.g., boat, bus) the child is able to

- a. determine the purpose [see B 5.a.]

- b. locate a cell [see B 5.b.]
- c. compare relative amounts in a single dimension [see C 5.c.]
- d. determine relationship among cells [see D 5.d.]
- e. make a summary statement [select from schedules the information required by given situations, e.g., from a travel schedule, select the departure time and carrier required to arrive at a given location at a given time]

6. Has independent classroom and research work habits⁹¹



OBJECTIVE

The child is able to focus all previously mastered study skills in independent study and/or research.

NOTE: The objective is the same as at Level E. The child's ability to direct his work independently would, of course, increase from level to level.

7. Increases locational facility



a. Refines card catalog skills¹⁰

OBJECTIVE

The child is able to locate target card quickly by applying these filing rules: (a) names beginning with either Mac or Mc are filed together as if all were spelled m-a-c; (b) if a word has been abbreviated, as Mr., it is filed as if it were spelled out; and, (c) if numbers are used they are filed as if they were spelled out.

Level F (cont.)

b. Refines cross reference skills¹¹

OBJECTIVE

The child applies the cross reference skill in D 7.c to all types of reference books.

8. Expands book skills¹²¹



OBJECTIVE

The child (a) consults the bibliography of a subject book to help him locate other materials of interest, and/or (b) uses the special study aids in textbooks [glossaries, appendixes] to help master factual information.

9. Expands facility in using library¹³



OBJECTIVE

The child is able to locate (a) any book or material by its call number, and/or (b) many subject areas by using the ten major groupings of the Dewey Decimal System (i.e., 000 - General works, 100 - Philosophy, 300 - Social science, 400 - Language, 500 - Pure science, 600 - Technology, 700 - Art, 800 - Literature, 900 - History).

10. Expands use of reference materials



a. Uses dictionaries for pronunciation¹⁴

OBJECTIVE

The child is able to use the diacritical markings in a dictionary to interpret the pronunciation of unfamiliar words--e.g., charybdis, escutcheon, imbroglio, spiegeleisen.

- b. Uses "SEE ALSO" direction¹⁵

OBJECTIVE

Given a SEE ALSO direction, the child locates the referred topic to find supplementary information.

- c. Uses Subject Index to Children's Magazines¹⁶

OBJECTIVE

The child (a) searches for current information in the subject index, and/or (b) tries to relocate specific articles read previously.

11. Adjusts reading rate to:



- a. Difficulty¹⁷¹

OBJECTIVE

The child adjusts his reading rate appropriately as reading materials become more or less difficult. [The child reads a given type of material--e.g., science material--written at his independent reading level of difficulty at a more rapid rate (greater number of words per minute) than similar material written at his instructional level of reading difficulty.]

- b. Purpose¹⁸¹

OBJECTIVE

The child skims materials at a rapid rate when seeking to verify or locate specific information; he reads material at a lower but rapid rate when seeking an overview or general idea regarding content; and he scans material at a relatively slow rate when his purpose is to master or locate to verify and recall factual information.

Level F (cont.)
Level G

NOTE: The objective is the same as at level E. The difficulty of selections would, of course, increase from level to level.

12. Organizes and evaluates materials



- a. Makes notes of main ideas and supporting facts¹⁹

OBJECTIVE

The child is able to identify main ideas and supporting facts in a selection and make notes in his own words.

- b. Summarizes materials²⁰¹

OBJECTIVE

The child is able to write concise summaries--e.g., identify major issues or main points of view expressed--of expository materials.

LEVEL G

1. Has representation skills



- a. Identifies likenesses and differences between two or more areas¹

OBJECTIVE

The child is able to make comparisons of geographic areas in terms of topographic, climatic, political, and demographic information provided on maps.

- b. Synthesizes information about an area²

OBJECTIVE

The child is able to use a variety of maps (e.g., topographic, climatic, political, and demographic) of a given area to determine specific characteristics, e.g., the child infers that since a particular area has an average rainfall, gently rolling hills and moderate climate, the occupations of the inhabitants may be mostly farm oriented.

2. Uses meridians and parallels to determine directions on any projection³



OBJECTIVE

The child is able to use meridians and parallels to determine directions on any projection, e.g., on an elliptical projection with the Prime Meridian at the center, the child traces the meridian from a given point to the pole to show north or south.

3. Has measurement skills



- a. Locates the same point or cell on various projections⁴

OBJECTIVE

The child is able to locate the same point or cell on various projections, e.g., polar, mercator.

- b. Uses inset maps to determine relative size of areas⁵

OBJECTIVE

The child is able to determine the relative size of two or more areas drawn to different scales by comparing the inset maps, which are all drawn to the same scale, e.g., the child determines that even though his map of Rhode Island and Texas are the same size, Texas is indeed larger since the area outlined on the inset map (which is of the U. S.) is much larger than that area outlined for Rhode Island.

4. Has graph skills



- a. Bar graphs⁶

OBJECTIVE

Given a horizontal or vertical bar graph which has three to four groups of bars, the child is able to

- 1) determine the purpose [see B 4.a.]

Level G (cont.)

- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see E 4.b.3)]
- 4) extract by interpolating [see E 4.b.4)]
- 5) determine differences between numbers extracted [see F 4.b.5)]
- 6) make a summary statement [see D 4.a.5)]
- 7) make projections and relate information [see E 4.a.7)]

b. Line graphs⁷

OBJECTIVE

Given a single or multiline cumulative or noncumulative line graph, the child is able to

- 1) determine the purpose [see B 4.a.]
- 2) compare relative amounts [see B 4.b.]
- 3) extract directly [see F 4.c.3)]
- 4) extract by interpolating [see F 4.c.4)]
- 5) determine differences between numbers extracted [see F 4.b.5)]

Level G (cont.)

6) make a summary statement [see D 4.a.5)]

7) make projections and relate information [see E 4.a.7)]

5. Interprets schedules⁸



OBJECTIVE

Given any schedule the child is able to

a. determine the purpose [see B 5.a.]

b. locate a cell [see B 5.b.]

c. compare relative amounts in a single dimension [see C 5.c.]

d. determine relationship among cells [see D 5.d.]

e. make a summary statement [see F 5.e.]

6. Has independent classroom and research work habits⁹¹



OBJECTIVE

The child is able to (a) focus all skills developed to this point on one problem, and (b) apply all relevant skills in all subject matter areas.

Level G (cont)

7. Refines book skills¹⁰¹



OBJECTIVE

The child is familiar with some reference books and their idiosyncratic organization (e.g., indexes are usually found in the back of a book, but the index to the World Almanac is in the front).

8. Increases facility in using library



a. Uses all information on catalog cards¹¹

OBJECTIVE

The child uses the information given on a catalog card--date of publication, publisher, number of illustrations, type of illustrations--to decide if the book or other material is appropriate to his purpose.

b. Increases understanding of Dewey System¹²

OBJECTIVE

The child is able to locate numbers for sections more specific than the ten major groupings as his interests become more specialized (i.e., 391 - costumes, 394 - holidays, 520 - astronomy, 540 - chemistry, 597 - fishes, 796 - sports, 92 or B - biography, 917 - travel in North America (inf. about states), 970 - Indians, 973 - American history.

9. Expands use of reference materials: current periodical indexes¹³



OBJECTIVE

The child uses (a) Subject Index to Children's Magazines for locating materials in children's magazines and (b) Abridged Reader's Guide for locating material in general adult magazines.

10. Adjusts reading rate to:



a. Difficulty ¹⁴¹

OBJECTIVE

The child adjusts his reading rate appropriately as reading materials become more or less difficult. [The child reads a given type of material--e.g., science material--written at his independent reading level of difficulty at a more rapid rate (greater number of words per minute) than similar material written at his instructional level of reading difficulty.]

b. Purpose ¹⁵¹

OBJECTIVE

The child skims materials at a rapid rate when seeking to verify or locate specific information; he reads material at a lower but rapid rate when seeking an overview or general idea regarding content; and he scans material at a relatively slow rate when his purpose is to master or locate to verify and recall factual information.

NOTE: The objective is the same as levels E and F. The difficulty of selections would, of course, increase from level to level.

11. Organizes and evaluates materials



a. Gains skill in note taking ¹⁶¹

OBJECTIVE

The child is able to take notes from varied sources in a form that is useful to him, i.e., permits him to retrieve information as needed.

b. Makes formal outlines ¹⁷

OBJECTIVE

Given selections written at his instructional level of difficulty, the child is able to select and order main points in a formal outline (e.g., I.A.L.).

NATIONAL EVALUATION COMMITTEE

Samuel Brownell
Professor of Urban Education
Graduate School
Yale University

Henry Chauncey
President
Educational Testing Service

Elizabeth Koontz
Wage and Labor Standards
Administration, U.S.
Department of Labor,
Washington

Patrick Suppes
Professor
Department of Mathematics
Stanford University

Launor F. Carter
Senior Vice President on
Technology and Development
System Development Corporation

Martin Deutsch
Director, Institute for
Developmental Studies
New York Medical College

Roderick McPhee
President
Punahou School, Honolulu

***Benton J. Underwood**
Professor
Department of Psychology
Northwestern University

Francis S. Chase
Professor
Department of Education
University of Chicago

Jack Edling
Director, Teaching Research
Division
Oregon State System of Higher
Education

G. Wesley Sowards
Director, Elementary Education
Florida State University

RESEARCH AND DEVELOPMENT CENTER POLICY REVIEW BOARD

Leonard Berkowitz
Chairman
Department of Psychology

Russell J. Hosler
Professor, Curriculum
and Instruction

Stephen C. Kieene
Dean, College of
Letters and Science

B. Robert Tabachnick
Chairman, Department
of Curriculum and
Instruction

Archie A. Buchmiller
Deputy State Superintendent
Department of Public Instruction

Clauston Jenkins
Assistant Director
Coordinating Committee for
Higher Education

Donald J. McCarty
Dean
School of Education

Henry C. Weinlick
Executive Secretary
Wisconsin Education Association

Robert E. Grinder
Chairman
Department of Educational
Psychology

Herbert J. Klausmeier
Director, R & D Center
Professor of Educational
Psychology

Ira Sharkansky
Associate Professor of Political
Science

M. Crawford Young
Associate Dean
The Graduate School

EXECUTIVE COMMITTEE

Edgar F. Borgatta
Birmingham Professor of
Sociology

Robert J. Davidson
Assistant Professor,
Educational Psychology

Russell J. Hosler
Professor of Curriculum and
Instruction and of Business

Wayne Otto
Professor of Curriculum and
Instruction (Reading)

Anne E. Buchanan
Project Specialist
R & D Center

Frank H. Farley
Associate Professor,
Educational Psychology

***Herbert J. Klausmeier**
Director, R & D Center
Professor of Educational
Psychology

Robert G. Petzold
Associate Dean of the School
of Education
Professor of Curriculum and
Instruction and of Music

Robin S. Chapman
Research Associate
R & D Center

FACULTY OF PRINCIPAL INVESTIGATORS

Vernon L. Allen
Professor of Psychology

Frank H. Farley
Associate Professor of Educational
Psychology

James Moser
Assistant Professor of Mathematics
Education, Visiting Scholar

Richard L. Venezky
Assistant Professor of English
and of Computer Sciences

Ted Czajkowski
Assistant Professor of Curriculum
and Instruction

Lester S. Golub
Lecturer in Curriculum and
Instruction and in English

Wayne Otto
Professor of Curriculum and
Instruction (Reading)

Alan Voelker
Assistant Professor of Curriculum
and Instruction

Robert E. Davidson
Assistant Professor of
Educational Psychology

John G. Harvey
Associate Professor of
Mathematics and of Curriculum
and Instruction

Milton O. Pella
Professor of Curriculum and
Instruction (Science)

Larry Wilder
Assistant Professor of Curriculum
and Instruction

Gary A. Davis
Associate Professor of
Educational Psychology

Herbert J. Klausmeier
Director, R & D Center
Professor of Educational
Psychology

Thomas A. Romberg
Associate Director, R & D Center
Professor of Mathematics and of
Curriculum and Instruction

Peter Wolff
Assistant Professor of Educational
Psychology

M. Vere DeVault
Professor of Curriculum and
Instruction (Mathematics)

Donald Lange
Assistant Professor of Curriculum
and Instruction

B. Robert Tabachnick
Chairman, Department
of Curriculum and
Instruction

MANAGEMENT COUNCIL

Herbert J. Klausmeier
Director, R & D Center
V.A.C. Henman Professor of
Educational Psychology

Thomas A. Romberg
Associate Director

James Walter
Director
Dissemination Program

Dan G. Woolpert
Director
Operations and Business

Mary R. Quilling
Director
Technical Development Program

* COMMITTEE CHAIRMAN