R E P O R T R E S U M E S

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PROGRAMED INSTRUCTION PROJECT. ANNUAL REPORT, 1964-65.

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NEW YORK CITY BOARD OF EDUCATION, BROOKLYN, N.Y.

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GOALS OF THE PROGRAMED INSTRUCTION PROJECT, IN ITS THIRD YEAR IN 1964-65, ARE TO STUDY USE OF COMMERCIALLY-PREPARED PROGRAMS IN 32 SELECTED ELEMENTARY SCHOOLS, TO PREPARE READING IMPROVEMENT PROGRAMS FOR SLOW ELEMENTARY READERS, AND TO CHRONICLE AND REPORT DEVELOPMENTS IN PROGRAMED INSTRUCTION. INTEREST IN TEACHING MACHINES AND PROGRAMED INSTRUCTION IS ACCOMODATED THROUGH TALKS AT PRINCIPALS' CONFERENCES, PARENTS' WORKSHOPS, AND CONVENTIONS. 95 TEACHERS AND 3325 PUPILS WITH DIVERSE CHARACTERISTICS PARTICIPATED IN THE PROJECT DURING 1964-65. INSTRUMENTS USED TO EVALUATE THE COMMERCIAL PROGRAMS INCLUDED PRE- AND POST-TESTS OF ABILITY, TEACHER AND PUPIL SELF-REPORTS, AND QUESTIONNAIRES. THIS DOCUMENT INCLUDES COMPREHENSIVE INFORMATION ON COMMERCIAL PROGRAMS BEING USED, A LIST OF TEACHERS AND SCHOOLS USING THEM, AN OPTIMISTIC PROGRESS REPORT OF PRE-TESTS IN THE DEVELOPMENT OF THE READING PROGRAMS, LONG BIBLIOGRAPHIES OF PROGRAMED INSTRUCTION RESEARCH AND OF COMMERCIAL PROGRAMS, AND SAMPLE TEACHERS' GUIDES TO THE PROGRAMS, AND TESTS. (LH)

Programed Instruction Project

EM004030

Annual Report

1964 – 1965

DIVISION OF ELEMENTARY SCHOOLS

BOARD OF EDUCATION OF THE CITY OF NEW YORK

PROGRAMED INSTRUCTION PROJECT

ANNUAL REPORT

1964-65

prepared by

Robert J. Fanning, Project Coordinator

Under the supervision of

Helene M. Lloyd, Assistant Superintendent

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS

Acting Associate Superintendent- Truda T. Weil
Assistant Superintendent- Helene M. Lloyd
Project Supervisor
Robert J. Fanning- Project Coordinator
Dorothy L. Cross-Assistant to Coordinator

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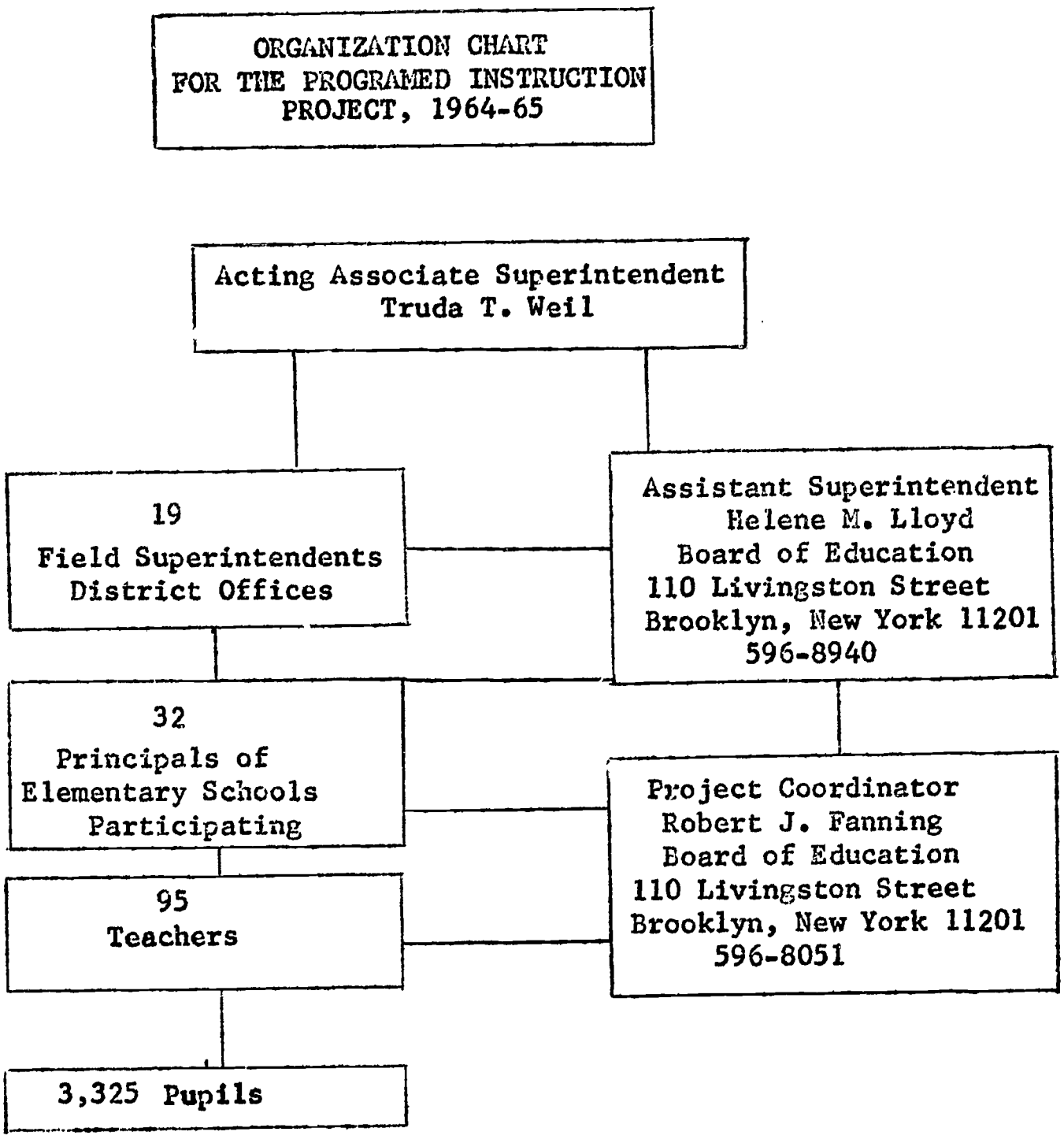
ORGANIZATION CHART
FOR THE PROGRAMED INSTRUCTION
PROJECT, 1964-65
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19
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95
Teachers
3,325 Pupils

INTRODUCTION

What is Programed Instruction? Programed instruction is one of several innovations on the educational scene of the sixties. It is an auto-instructional technique which involves:

1. The presentation of information to the learner, usually in small, easily-absorbed increments.

2. Careful, sequential ordering of these steps.

3. An active response by the learner at each step along the way.

4. Confirmation of the learner's responses as soon as he makes them.

The educational psychology of programed instruction is founded on the successive approximations of B.F. Skinner and other behavioral psychologists. Norman Crowder is responsible for that school of programing called "branching" or "instrinsic" programing. Good programs, however, have an empirical base. They are tested on learners representative of the target population both during and after the programing process. The burden of the teaching-learning process is thus placed on the program: if the learner fails to learn, the program is held to be at fault, not the learner. When this happens, the program is revised and tested again until it performs as desired.

What Is a Teaching Machine? A teaching machine is a program-holder. It is a device for presenting the program to the learner a step at a time. Some teaching machines can make audio and visual presentations to the learner which printed programs cannot do. An advantage common to almost all teaching machines is that they conceal answers until the learner makes his own response.

Why a Project in Programed Instruction? The promise of programed instruction is great: faster and better learning; individualized rate of instruction; immediate confirmation of responses. In proceeding through linear programs, students, especially slower students, experience a new feeling of success and confidence. By a series of successively closer approximations, the program takes the learner from what he knows to what we want him to know. Programs are pre-tested; good programs virtually guarantee that learning will take place.

The ideal teaching machine for presenting a program to pupils is the teacher. Good teaching employs most, if not all, of the strategies of programed instruction. The good teacher can do whatever a program can do. But the teacher can tutor only one pupil at a time.

Having proved itself in industry, in the colleges, and in the armed forces, it is time programed instruction redeemed its promises in our schools. We owe it to our elementary school pupils to explore its possibilities. What <u>can</u> be done via this method, <u>should</u> be done.

This report chronicles the Elementary Division's third year of efforts in that direction.

CHAPTER I
GOALS AND DIRECTIONS

I. OBJECTIVES OF THE PROJECT

There are three principal purposes for the Elementary Division's project on Programed Instruction:

A. To determine the values of programed instruction through a pilot study of the use of commercially-prepared programs of instruction in selected elementary schools.

B. To prepare programed material in reading to assist in the Division's efforts in upgrading the reading abilities of pupils in Grades 1-6.

C. To make an orderly study of programed instruction; to keep abreast of developments in the field, especially in relation to elementary school needs; to disseminate this information.

II. HISTORY OF THE PROJECT

A. During the summer of 1962, then Associate Superintendent John B. King appointed Assistant Superintendent Helene M. Lloyd to head a project to investigate the rapidly growing field of teaching machines and programed instruction. In view of the increasing body of research literature on the subject, Doctor King felt that the Board of Education had an obligation to the pupils to do so.

Accordingly, in September, 1962, an assistant-to-principal, Robert J. Fanning, was assigned to coordinate the Programed Instruction Project. A study of the general field of programed instruction was made. This revealed some promising benefits for elementary pupils, and so selected commercial programs were introduced into eight pilot schools in March, 1963. Evaluation of these two phases of the project yielded two principal facts:

1. Programed instruction techniques can be very successful with elementary school pupils.

2. There is a scarcity of suitable programed material in reading to meet the needs, interests, and abilities of our New York City elementary school pupils.

B. Because of these findings and because of the demonstrated reading needs of our pupils, another phase--the program development phase--was initiated. A foundation grant application was prepared in an attempt to secure financial assistance. A three-year grant was obtained from the Fund for the Advancement of Education and this phase of the project was under way in January, 1964.

In February, 1964, Miss Dorothy L. Cross, a teacher from Public School 273, Brooklyn, was assigned to the Division of Elementary Schools as Assistant to the Coordinator of Programed Instruction.

C. While the Programed Instruction project has moved ahead in efforts to accomplish the three objectives as stated above, the aims are not mutually exclusive. Work continues to proceed simultaneously in four areas:

1. Commercially-prepared programs are obtained as they are published and they are evaluated in terms of our curriculum requirements and adequacy of preparation and presentation. Selected programs are introduced into pilot schools, and their use is evaluated by pupils, teachers and supervisors.

2. Selected teachers of reading having received preparation in programing, *and* work in program development is now under way.

3. There is continuing investigation into the field of programed instruction through the reading of books and research literature, attendance at meetings, interviews with college and university experts, and with publishers.

4. Increasing interest in teaching machines and programed instruction is accommodated through talks at principals' conferences, meetings, parents' workshops, conventions, etc.

CHAPTER II
THE PILOT PROJECT IN ACTION

I. PILOT STUDIES OF COMMERCIALLY-PREPARED MATERIAL

The pilot study of commercially-prepared programed material has four principal purposes:

- To acquaint as many teachers as possible with the methods and materials of programed instruction through classroom use of programed material.
- To evaluate some commercially-prepared material.
- To study the possible uses of programed instruction in elementary education.
- To identify any relationships of pupil achievement via programed instruction to such variables as age, reading ability, and time required for program completion.

A. Distribution of Programs

In an effort to obtain adequate sampling of pupils using programed material, schools of varied nature were selected for participation in the 1964-65 project. All boroughs were involved, as well as Special Service and schools in average or above-average economic neighborhoods. Of the thirty-two schools involved during the 1964-65 school year, eleven were Special Service schools. In general, the programs were employed in one class per school, but many principals continued to experiment in other classes after the project data had been collected.

Following is a list of programs used during the 1964-65 school year, and the schools in which they were deployed:

Programmed Reading: P-6-M, P-161-M (2 classes), P-138-X, P-236-K, P-209-K, P-284-K.

Programmed Geography: P-6-M, P-42-M, P-161-M, P-64-X, P-138-X, P-110-K, P-194-K, P-207-K, P-209-K, P-221-K, P-236-K, P-273-K, P-38-Q, P-66-Q, P-29-R, P-124-Q.

Your Study Skills: P-6-M, P-138-X, P-207-K, P-273-K, P-38-Q, P-46-Q, P-66-Q, P-124-Q, P-165-Q, P-29-R.

Learning How to Use the Dictionary: P-20-M, P-51-M, P-93-X, P-9-K, P-19-K, P-103-K, P-157-K, P-209-K, P-154-Q, P-187-Q, P-16-R.

Latitude and Longitude: P-20-M, P-42-M, P-51-M, P-161-M, P-32-X, P-64-X, P-93-X, P-138-X, P-110-K, P-194-K, P-199-K, P-207-K, P-221-K, P-236-K, P-273-K, P-284-K, P-38-Q, P-46-Q P-66-Q, P-69-Q, P-124-Q, P-165-Q.

Predicting the Weather: P-20-M, P-42-M, P-51-M, P-161-M, P-138-X, P-110-K, P-209-K, P-273-K, P-284-K, P-38-Q, P-66-Q, P-124-Q, P-165-Q.

Time Telling: P-161-M, P-32-X, P-93-X, P-207-K, P-273-K, P-284-K, P-38-Q, P-165-Q.

Maps: How We Use Them: P-9-K, P-19-K, P-103-K, P-157-K, P-154-Q, P-187-Q, P-16-R.

A chart showing distribution of programs by school, class and teacher appears on pages five through twelve.

B. Discussion of Programs

1. Programmed Reading is a series on beginning reading consisting at present of eighteen programed booklets. Programmed Reading, Book 1, was used in seven pilot schools in the 1962-63 school year. Subsequently, a preliminary book, Programed Primer, was published, and, during the 1963-64 school year, thirteen additional bboks in the series were published. For a second try-out, this time using the Primer, nine different schools were selected with the assistance of the Principals and Field Assistant Superintendents. On November 4th and 6th, 1963, conferences were held in the Library of Public School 6, Manhattan, for the purpose of orienting the ten first-year teachers who were to use the programed series in 1963-64, beginning with the Programed Primer. Doctor M.W. Sullivan of Sullivan Associates, the firm that programed the series, spoke to the teachers on the history, design and philosophy of the material. Assistant Superintendent Helene M. Lloyd, who chaired the meetings, advised that the regular first-year reading program should not be replaced by the programed material without the approval of the school principal and the Field Assistant Superintendent. The teachers were asked to implement the program after they had carefully prepared themselves through reading of the teacher's manual and examination of the associated teaching material.

Most classes were underway by December 1, 1963. Principals were asked to supply local supervision of the program try-out, and to suspend the use of the material if it were found that there were insurmountable obstacles to its implementation in the classroom, or if it were found that the pupils' normal reading progress was being (continued on page 13.)

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street Brooklyn, New York 11201

PROGRAMED INSTRUCTION 1964-65

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
Manhattan P-6-M	Asst.Supt.E.Scalea Prin. Miss S.Andrews	45 E. 81st St., 10028 Re-7-5450	2-3 Mrs. Rosalyn Schwartz 4-302 Mrs. Blanche Gans 6-301 Miss Judith Moffon	Programed Reading Programed Geography Your Study Skills
*P-20-M	Asst. Supt.F.Becker Prin. B. Falon	42 Rivington St., 10002 Al-4-5610	4-3 Miss Doris E. Feverman 5-3 Mrs. Elinor M.Gertz 6-2 Mr. Arnold Messinger	Learning How to Use the Dictionary Latitude and Longitude Predicting Weather
P-42-M	Asst.Supt. F.Becker Prin. Mr.M.Glassner	71 Hester St., 10002 Ca-6-4068	4-3 Miss Marion Ryan 5-3 Miss Patricia Crean 6-3 Mr.Gene Morrison	Programed Geography Latitude and Longitude Predicting Weather
**P-51-M	Asst.Supt.M.Finkel Prin. Miss G.Canary	250 West 45thSt., 10036 Pl-7-9471	4-1 Mrs. Isabel Cracowaner 5-1 Mr. Seymour Nachman 6-1 Mrs. Theodora Sklover	Learning How to Use the Dictionary Latitude and Longitude Predicting the Weather
P-152-M	Asst.Supt.S.Rosenberg Prin. Miss V.Meyers	93 Nagel Ave.,10040 Lo-7-4165	5-405 Mrs.Minnie Langer 5-407 Mr. Martin Fern	Your Study Skills Latitude and Longitude

* Special Service Schools

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
*P-161-M	Asst. Supt. M. Clark Prin. Dr. Bernard Friedman	West 33rd St. (Convent and Amsterdam Aves.) 10027 Au-6-7870	2-1 Miss Mary Ann Fedak 3-3 Mrs. Sandra L. Seltzer 4-2 Mrs. Arline Glickman 5-2 Mr. Robert Grossman 5-1 Mr. Albert Estreicher	Time Telling Programed Reading Programed Geography Latitude and Longitude Predicting Weather
*P-32-X	Asst. Supt. S. Rosenberg Prin. Mr. D. Hayes	690 E. 183 St., 10458 Fo-7-3573	2-1 Mrs. Mollie Rabinowitz 5-1 Mrs. Eileen D. Norton	Time Telling Latitude and Longitude
P-64-X	Asst. Supt. M. Ames Prin. Mr. M. Eisenberg	1425 Walton Ave., 10452 Je-7-8224	4-3 Miss Roberta Sherman 5-1 Mrs. Ruth Zebel	Programed Geography Latitude and Longitude
P-93-X	Asst. Supt. E. Maleska Prin. Mr. Jack August	1535 Story Ave., 10472 Ti-2-1210	2-2 Mrs. Joan Anderson 4-1 Mrs. Lucile Goldat 5-2 Miss Constance Provenzano	Time Telling Learning How to Use the Dictionary Latitude and Longitude
P-138-X	Asst. Supt. E. Maleska Prin. Mr. R. Drescher	2060 Lafayette Ave. 10473 Sy-2-1022	2-218 Mrs. Lida Fox 5-322 Mrs. Beatrice Aronoff 4-IGC Mrs. Margaret M. Kiernan 6-303 IGC Mr. Paul Fassler	Programed Reading Latitude and Longitude Programed Geography Predicting the Weather Your Study Skills

*Special Service School

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
*P-9-K	Asst. Supt.M.Mehlman Prin. Mr. M. Weinberger	80 Underhill Ave., 11238 St-3-6858	4-1 Mrs. Natalie Steinberg 6-3 Mrs. Phoebe Friedman	Learning to Use the Dictionary Maps: How We Use Them
*P-19-K	Asst. Supt.A.Jaffe Prin. Mr.Arthur Bell	325 S. 3rd St., 11211 Ev-7-8554	4-1 Mr. Edward Bornstein 6-2 Mr.David A.Brown	Learning How to Use the Dictionary Maps: How We Use Them
P-103-K	Asst. Supt.C.McQuillen Prin. Mrs.Gertrude Pascal	5307 14th Ave., 11219 UI-1-7051	4-2 Mrs. Harriet Finkelstein 6-2 Miss Linda Martorano	Learning to Use the Dictionary Maps: How We Read Them
*P-110-K	Asst. Supt.E.Crowley Prin. Dr.H.Kessler	124 Monitor St., 11222 Ev-3-7800	5-1 Mrs. Leslie Fish 6-2 Mr. Martin Gilman 6-1 Mrs. Phyllis Butler	Programed Geography Latitude and Longitude Predicting Weather
*P-157-K	Asst. Supt.M.Mehlman Prin. Mr.T.Carlin	850 Kent Ave., 11205 Ma-2-5728	4-5 Miss Dorothy Daniels 6-4 Miss Bertha Stockell	Learning How to Use the Dictionary Maps: How We Read Them

* Special Service Schools

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
P-194-K -------	Asst.Supt. A.Jaffe Prin. Dr.M.Pincus	Ave. W and Knapp St., 11229 Sh-3-1180	4-4 Miss Lucile Weidman 5-2 Mrs. Ruth Bromberg	Programed Geography Latitude and Longitude
P-199-K	Asst.Supt. A.Jaffe Prin. Mr. G.Becker	1100 Elm Ave., 11230 De-9-1422	6-4 IGC Mr. Ronald Cohen	Latitude and Longitude
P-207-K	Asst.Supt. A. Jaffe Prin. Dr.L.Berlin	4011 Fillmore Ave., 11234 De-9-8648	1-4 Mrs. Kathryn M. Leonard 5-3 Mrs. Gussie Steinberg 5-1 Mrs. Mildred Ashforth 6-1 Mr. Emanuel Gross	Time Telling Programed Geography Latitude and Longitude Your Study Skills
P-209-K	Asst.Supt. A. Jaffe Prin. D.J.Bloomfield	Ave. Z and East 7th St., 11235 Sh-3-0616	6-5 Mrs. Ida Rosenblum 2-5 Mrs. Ethel M. Johansen 4-5 Mrs. Anita G. Greenfield	Predicting the Weather Programed Reading Programed Geography

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
P-221-K	Asst.Supt. M.Meyers Prin. W. Emmer	791 Empire Blvd., 11213 S1-6-7076	4-2 Mrs. Paula Gorelick 5-1(IGC) Mrs. Selma Simon	Programed Geography Latitude and Longitude
P-236-K	Asst.Supt. A. Jaffe Prin. Moe Deutsch	6302 Ave. U, 11234 Hi-4-6969	2-1 Mrs. Lillian Bergman 4-2 (IGC) Mrs. Mildred Gershbein 5-3 Mrs. Selma Reisman	Programed Reading Programed Geography Latitude and Longitude
P-273-K	Asst.Supt. M. Douglas Prin. Dr.A. Nevins	923 Jerome St., 11207 Ni-9-5762	2-4 Mrs. Louise Pecorarro 5-2 & 6-3 Mrs. Shirley Baron 5-5 Mrs. Rosalyn Brodsky 5-3 Mrs. Rochelle Wortman 6-5 Miss Eileen Chanin	Time Telling Latitude and Longitude Programed Geography Predicting the Weather Your Study Skills

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
P-284-K	Asst.Supt. M.Meyers Prin. Dr.Paul Treatman	220 Watkins St., 11212 Di-2-3114	2-1 Mrs. Beatrice Sherman 2-2 Mrs. Sima Pomerantz 5-1 Mrs. Anita Vatalie 6-3 Mr. Irving Kaye	Time Telling Programed Reading Latitude and Longitude Predicting the Weather
P-38-Q	Asst. Supt.L. Ryan Prin. Mr.D. Seidman	135-21 241st St.,11422 La-8-2276	2-1 Mrs. Estelle Hochman 4-1 Mrs. Anna H.Balser 5-1 Mrs. Mildred Brooks 6-3 Mr. Harry Okin 6-3 Mr. Harry Okin	Time Telling Programed Geography Latitude and Longitude Predicting the Weather Your Study Skills
P-46-Q	Asst. Supt.S.Cameron Prin. Mr. A.McNally	218th St. and 67th Ave., 11364 Ba-9-8313	5-2 Miss Joan Mulvaney 4-2IG Mrs. Kathleen Marits	Latitude and Longitude Your Study Skills

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
P-66-Q	Asst.Supt. E. Pitt Prin. Mrs. E. Feingold	85-11 102nd St., 11418 Vi-9-0184	4-3 Miss Gloria Imperante 5-2 Mrs. Loretta G. Sheridan 6-1 Miss Elizabeth Zuill 5-1 Mrs. Edna Harris	Programed Geography Latitude and Longitude Your Study Skills Predicting the Weather
P-69-Q	Asst.Supt.M. Halleron Prin. Mrs. M. Bird	77-02 37th Ave., 11372 Ha-4-5200	5-3 Mrs. Anna Milstein	Latitude and Longitude
P-124-Q	Asst.Supt. L. Ryan Prin. Mr. J.Graff	129-15 150th Ave., 11420 Ja-9-2580	4-1 Miss Elissa DeStefano 5-2 Mrs. Pauline Wilson 5-1 Mr. Alfred Bernstein 6-1 Mrs. Teresa Hughes	Programed Geography Latitude and Longitude Predicting the Weather Your Study Skills
P-154-Q	Asst.Supt. C.Meagher Prin. Mr.S.Rothman	70-02 162nd St., 11368 Re-9-1969	4-1 Mrs. Enid Lerner 6-1 Mrs. Anna K.Daniels	Learning How to Use the Dictionary Maps: How We Use Them

PROGRAMED INSTRUCTION 1964-65 (cont.)

School	Assistant Superintendent and Principal	Address and Telephone No.	Class and Teacher	Name of Program
P-165-Q	Asst.Supt.C.Meagher Prin. Mr.S.Feinstein	70th Road and 150th St. 11367 Bo-3-3379	2-5 Mrs. Charna Bennett 5-4 Mrs. Natalie Hamberg 6-5 Mrs. Antoinette Nicolleti 6-1 Mr. Bernard Schneider	Time Telling Latitude and Longitude Predicting the Weather Your Study Skills
P-187-Q	Asst.Supt.A.Cameron Prin. Dr. P.Keller	61-25 Marathon Pkwy., 11362 Ba-9-8788	4-1 Mrs. Estelle Gellis 5-1 Mr. Abraham A. Goldman	Learning How to Use the Dictionary Maps: How We Read Them
*P-16-R	Asst. Supt.M.Wollin Prin. Mr. J. Steinfeld	211 Daniel Low Terrace 10301 Gi-7-0124	4-1 Mrs. Alice Iuce 6-1 Miss Carmella Iacobelli	Learning to Use the Dictionary Maps: How We Read Them
P-29-R	Asst. Supt.M. Wollin Prin. Miss M.McGrath	1581 Victory Blvd., 10314 Gi-2-2891	4-4 Mrs. Lottie Carney 4-1 Mrs. Margaret Broderick	Programed Geography Your Study Skills

*Special Service School

hindered through use of the program. During the course of the year, two classes dropped the use of the material. Of the remaining seven classes, six were promoted intact to the second grade in June, 1964, with the cooperation of the principals and Assistant Superintendents, for the purpose of giving the pupils an opportunity to finish the series. The seventh class (in Public School 69, Queens) completed the first series of fourteen booklets by June, 1964.

As an evaluative measure, the Gates Primary Reading Tests (Word Meaning and Paragraph Reading) were administered to the programed classes and to the next class on the grade using a basal series. The tests were given to the classes in P.S. 69, Queens, in June 1964, and to the other classes as they finished the series during the Spring, 1965 term. An analysis of test results showed no significant difference in achievement between the programed classes and the basal series classes, as measured by the Gates tests.

2. Programmed Geography deals with aspects of physical geography for grades 4, 5 and 6. The first of three books, The Earth in Space, was introduced during the 1963-64 in two schools (P.S. 207,K. and P.S. 29, R.) in one fourth grade class per school. Individual conferences were held with these teachers for the purpose of familiarizing them with programed instruction in general, and for suggesting ways of using the material.

On the basis of encouraging results in the two pilot schools, The Earth in Space and the next volume, Continents and Oceans, were introduced into fourteen additional schools during 1964-65.

The program is a large, soft-covered booklet in linear program style. It is attractively printed, with numerous illustrations in color. In view of the high price of the booklets, teachers were instructed to have the pupils write their responses in a pad or notebook, instead of on the pages of the programs themselves. Tests and a teachers manual are available. This is one of the few programs available for elementary school use that supplies validation data with the program. The tests supplied with the programs are comprehensive but lengthy. They we adapted by the coordinator for use as pre- and posttests.

3. Latitude and Longitude is a short-term (384-frame) program which had been used in seven schools during the 1962-63 school year. On the basis of experience in that year, the program was used again during 1963-64, concentrating on the fifth year. The program was withdrawn from a privileged school where it had been used successfully during 1962-63, and introduced in a deprived, Special Service School. The program is concerned with a narrow, specific skill, i.e., the ability to find, read, write, and identify locations from a globe or simple map. A built-in slider for concealing and revealing answers remains permanently attached to the booklet. In the interests of disseminating knowledge about programed instruction as far as possible, a new group of teachers was selected to implement this program in 1963-64. Where data on classroom use had already been obtained through unilateral use of the program in 1962-63, teachers

were encouraged by Assistant Superintendent Lloyd to take a greater part in the program by use of periodic discussions, demonstrations, and application of knowledge gained from the program. Guides and other material prepared for teachers in 1962-63 were re-used in 1963-64; the reader is referred to Elementary Division, Programed Instruction, 1962-63 for specimen copies.

The subject matter dealt with in this program is eminently susceptible to programing because of its inherent structure. It is one of the more popular of the eight programs used during 1964-65; twenty-two classes participated in its study.

4. The format of Your Study Skills is similar to that of the Latitude and Longitude program: it is a short, linear, non-consumable program with a built-in answer slider to reveal and conceal frame answers. It is concerned with such specific study skills as skimming, note-taking and time-scheduling. During 1963-64 the program was introduced in different classes in seven of the 1962-63 pilot schools, and an eighth school was added: P-149-Q.

Two additional schcols became involved in the use of this program during 1964-65. By mutual agreement, the program was transferred from P.S. 149, Queens, to P.S. 124, Queens.

The vehicle appeals to youngsters at the seventh-, eighth-, and ninth-grade level, but the content and reading level were suitable for some sixth-grade classes in the study. Some principals tried out the program in fifth-grade classes where the readability level of the children was appropriate.

Teachers who were to use the program were invited to an orientation session prior to its use in the classroom. Pre-and posttests were distributed, as well as a teacher's guide which had been developed by the Coordinator.

5. Learning How to Use the Dictionary was introduced in eleven pilot schools for the first time during the 1964-65 school year. It was used in fourth-year classes, although the content covered fourth-, fifth-, and some sixth-year topics, in relation to the New York City Curriculum Bulletin Number 4, 1954-55 Series (Course of Study, Language Arts, Grades 1-6). As are all the programs in the Programed Instruction Project, Learning How to Use the Dictionary is a linear-style program. It is designed to be used specifically with Webster's New World Dictionary, Elementary Edition. The program cannot be used effectively without the dictionary. Pupils are required by the program to consult their dictionaries more than 360 times.

The program is divided into two sections. The first section purports to teach the basic skills necessary to find words in the dictionary, such as, rules of alphabetization, dictionary format, and guide words. The second section purports to teach the use of the dictionary in finding word meanings and as an aid in spelling and writing.

A test booklet accompanies the program, and a copy was supplied for each pupil. Two test forms are included for each of the two sections of the program. These were used as pre-and posttests. A teacher's manual explains the use of the programed text, makes some suggestions about the role of the teacher vis-à-vis the program, and contains an answer key for the tests.

6. Predicting the Weather is concerned more specifically with using cloud appearance to predict the weather. The program was introduced during the 1964-65 school year for the first time in thirteen schools. It is a short-term program, with only ninety-seven frames. In view of its content and readability level, it was used in sixth-year classes in these schools.

   The program is accompanied by several plates showing photographs of the various types of clouds, to which the pupils refer during the course of the program. The publisher's manual was supplemented by a teacher's guide and tests developed by the Coordinator. (See Appendix C.)

7. Time Telling is one of the very few programed books presently suited for use by second-year pupils. It was designed to teach these youngsters how to tell time on the hour and half-hour.

   This short-term program was introduced in eight selected schools for the first time during 1964-65. Three of the eight are Special Service Schools. The teachers of the pilot classes attended an orientation session prior to the use of the program. Tests were distributed for use before and after the program, and a guide developed by the Coordinator was given to the teachers. (See Appendix C.)

   Each program is accompanied by a cardboard clock face with movable hands which the pupils use as they work their programs. Little use is made of formal language; the readability level was, on the whole, suitable for use by our second-year children.

8. Maps: How We Read Them is a short-term, non-consumable program for fifth-year use which was introduced into seven pilot schools for the first time during the 1964-65 school year.

   It is designed to teach the use of several different kinds of maps (e.g., physical, political, population, rainfall, products) which are illustrated in the program. During their work on the program, the pupils are taken on an imaginary trip through Spain. This is symptomatic of a current trend in elementary school programs to build in motivational devices other than the "success" feature which is typical of linear programs.

   The last unit of this program is a review section; this was reproduced without answers and used as a pre-and posttest. An orientation session was held for the teachers who were to use the program. Tests and a guide developed by the Coordinator were distributed. (See Appendix C.)

C. Design of Pilot Study

While a principal purpose of the pilot project has been to sensitize and orient an ever-increasing number of teachers to programed instruction, other benefits were anticipated as, possible identification of some variables in programed instruction: length of program, attention span, reading level and others. The tests, pupil questionnaires and other evaluative instruments used in 1962-63 and 1963-64 were used without substantive modification in 1964-65.

1. Pre-and Posttests

Before exposing their pupils to the programs, teachers administered a test to measure the children's knowledge of the material contained in the program. In those cases where suitable tests were supplied with the programs, these were used in the design. Where suitable tests were lacking, they were formulated by the Coordinator. Posttests, either the same as the pretest or a different form, were administered to each pupil as soon as he finished the program.

2. Test Records

Forms for recording pupil's names, age, reading level, pre-and postcest scores, and time needed to complete the program were used. These data were sought in an effort to identify relationships between these variables and achievement via programed instruction as indicated by pre-and posttest scores. (See Appendix C.)

3. Pupil Time Records

Pupils in fourth-, fifth-, and sixth-year classes were held responsible for keeping a written record of the time spent on their programs. This was done to help in making judgments on the time investment required for use of programed material. Lower grade teachers kept time records on behalf of their children.

4. Questionnaire for Pupils

Each fourth-, fifth-, and sixth-grade pupil was asked to fill out a questionnaire upon his completion of the program. One "open-end" and four "check-off" questions were used. (See Appendix C.)

5. Questionnaire for Teachers

Teachers' judgments regarding programed instruction were elicited by means of a questionnaire. (See Appendix C.) Reactions in four general areas were sought:
Use of Programed Material
Content of the Program Used
Pupil Reactions
General (opinions, background, parental reactions)

D. Supervision of Pilot Study

The pilot study of programed instruction is under the supervision of Assistant Superintendent Helene M. Lloyd. Mrs. Lloyd was continuously apprised of the project's progress, and provided on-the-scene supervision through classroom visits with the Coordinator. Classroom observations, group and individual conferences with teachers and principals, interviews with pupils, all contributed to the supervision of the program. During these visits, use of the programs was observed and difficulties were eliminated. Principals and subject-matter coordinators assisted in providing local supervision.

E. Growth of Pilot Project, 1962-65

	1962-63	1963-64	1964-65
No. of Schools	8	22	32
No. of Programs	4	5	8
No. of Teachers	29	41	94
No. of Pupils	957	1,435	3,290

1. In Relation to Schools

The number of schools in the Division's Programed Instruction Project has risen 400% since its inception in 1962. In the course of this expansion, the cooperation of principals and Assistant Superintendents was sought and wholeheartedly given.

In 1962-63, the criteria used in selecting pilot schools were, low teacher mobility and low pupil mobility. These criteria were used to insure continuity of the study. However, it was found that in applying these criteria, these low-mobility schools were also schools in favored areas. To counteract any skewed results obtained from these early pilot studies, a greater number of Special Service schools was selected in 1963-64, and more in 1964-65. Of the thirty-two schools in the 1964-65 study, eleven, or 34% were Special Service schools.

2. In Relation to Programs

An increase in the number of commercially-available programs suitable for use in the elementary schools was noted during the 1964-65 school year. Not all were adaptable to use in the Division's project, however, because of either non-conformfty to the City's courses of study, inadequacy of readability level, or both.

One of the programs used in 1962-63, Words, A Programed Course in Vocabulary Development, was dropped in 1963-64 because of motivational factors. Another program, Mathematics Enrichment, was suspended from use in the Division's Programed Instruction Project during 1964-65 pending development of more adequate tests.

Four new programs were selected from among the publishers' offerings for pilot use in our schools during 1964-65. They were:

Learning How to Use the Dictionary
Predicting the Weather
Time Telling
Maps: How We Read Them

3. In Relation to Teachers

The number of teachers who gained insights into programed instruction through classroom experiences with programed material rose from forty-one in 1963-64 to ninety-four in 1964-65. In a few instances, a teacher who had used one program in previous years was selected to implement a new one in 1964-65. In most cases, teachers who had had no previous experience with the technique were selected.

4. In Relation to Pupils

The 129% rise in the number of pupils involved in the study in 1964-65 over the 1963-64 figure was gratifying in two respects: it provided many more data about pupils and programs, and it represented a greater diversity of pupil characteristics.

II. INVESTIGATION AND SHARING

A. Investigation

While a solid background in the principles of programed instruction was gained during the first two years of the project, it was found that much can be learned from a continuing study of the psychology of programed instruction, and from reports of other "users" of programed material. Experimentation on both levels--research and implementation--still is proceeding apace, although implementation studies have exceeded basic research studies during the current year. Several important books and articles on programed instruction appeared during 1964-65. Titles found to be of special value to our study are listed below, together with some comments about a recent convention of the National Society for Programed Instruction.

1. Recently Published Books on Programed Instruction

Markle, Susan M. Good Frames and Bad: A Grammar of Frame Writing, New York: John Wiley & Sons, Inc., 1964.

United States Department of Health, Education and Welfare. The Research on Programed Instruction: An Annotated Bibliography, by Wilbur Schramm. U.S.O.E. Publication No. 20402. Washington, D.C.: U.S. Government Printing Office, 1964.

2. Recent Articles on Programed Instruction

Bjorkquist, D.C., and Lease, A.A. "Flash Cards," School Shop, 24:18+ (January, 1965).

Murray, J.B. "Teaching machines, programed instruction," The Catholic Educational Review, 62:527-40 (November, 1964).

Markle, S.M. "Individualized programed instruction: the programer," Teachers College Record, 66:219-28 (December, 1964).

Doty, B.A., and Doty, L.A. "Programed instructional effectiveness in relation to certain student characteristics," Journal of Educational Psychology, 55:334-8 (December, 1964).

McDonald, F.J. "Meaningful learning and retention: task and method variables; programed learning," Review of Educational Research, 34:541 (December, 1964).

Chambers, B., and Schulte, J.M. "Evaluation of programed instruction," Education, 85:172-6, 245-9 (November-December, 1964).

O'Toole, J.F. Jr. "Teachers' and principals' attitudes towards programed instruction in the elementary school," AV Communication Review, 12:431-9 (Winter, 1964).

Lysaught, J.P. "Programing and the teacher," N.Y. State Education, 52:18-19 (January, 1965).

Malpass, L.F., et al. "Automated instruction for retarded children," American Journal of Mental Deficiency, 69:405-12 (November, 1964).

Friedman, L. "Teaching machines or programed instruction?" High Points, 46:32-7 (November, 1964).

Gotkin, L.G. "Experimentation with programed instruction," New York Society for the Experimental Study of Education Yearbook, 42-8, 1963.

Maehr, M.L. "Programed learning and the role of the teacher," Journal of Educational Research, 57:554-6 (July, 1964).

Archer, N.S. and Sanzotta, S.M. "Administrative and instructional adjustments resulting from the use of programed materials," Audiovisual Instruction, 9:608-9+ (November, 1964).

Sleuchert, W.M. and Stephens, M.L. Jr. "Effectiveness of a programed text in plane geometry," Educational Research (British), 57:542-4 (July, 1964).

Klemer, D., and Sohn, D. "How to put programed instruction in its place," School Management, 8:84-8 (September, 1964).

Wood, L.A. "Programed textual material as a partial substitute for teacher-led classroom procedures in geography," Journal of Educational Research, 58:22-6 (September, 1964).

Hershberger, W. "Self evaluation responding and typographical cueing: techniques for programming self-instructional reading materials," Journal of Educational Psychology, 55:288-96 (October, 1964).

Hamilton, N.R. "Effects of logical versus random sequencing of items in an auto-instructional program under two conditions of covert response," Journal of Educational Psychology, 55:258-66 (October, 1964).

Spense, W. "Research and programed instruction," Industrial Arts and Vocational Education, 53:57 (October, 1964).

Pressey, S.L. "Autoinstruction: prospectives, problems, potentials," National Society for the Study of Education Yearbook, 1:354-70, 1964.

Lumsdaine, A.A. "Educational technology, programed learning and instructional science," National Society for the Study of Education Yearbook, 3:371-401, 1964.

Markle, Susan M. "Harvard teaching machine project: the first hundred days," AV Communication Review, 12:344-51, (Fall, 1964).

Amato, P.P. "Programed instruction: its potential utility in speech," Speech Teacher, 13:190-6 (September, 1964).

Ayers, J.D. "Programed instruction, its potential," Comparative Education Review, 4:219-26 (September, 1964).

Theobald, John D."How to select a program," Industrial Arts and Vocational Education, 53:51 (October, 1964).

Rush, M.L. "Programed instruction of the language of directions," American Annals of the Deaf, 109:356-8 (September, 1964).

Drozdoff, G. "Teacher prepared programed units for industrial subjects," Industrial Arts and Vocational Education, 53:43 (October, 1964).

Times Educational Supplement (London), "Kite marks for programers?" 2573:354 (September 11, 1964).

Cooner, S.L. "Programed blueprint reading" Industrial Arts and Vocational Education, 53:52-3 (October, 1964).

Plezia, N.F. "Teacher-made program: electricity," Industrial Education and Vocational Education, 53:48 (October, 1964).

Shimabukuro, S. "Programed instruction: threat or challenge?" Audiovisual instruction, 9:277-80 (May, 1964).

Briggs, L.J. "Teaching and programed instruction: roles and role potentials," Audiovisual Instruction, 9:273-6 (May, 1964).

Times Educational Supplement (London), "Utopia comes to town," 2556:1354, (May 15, 1964).

Ryan, W.F., "Programed instruction administration," The Clearing House, 38:568(May, 1964).

Resnick, L.B. "Programed instruction and the teaching of complex intellectual skills: problems and prospects," Harvard Educational Review, 34:80-8; 325-1 (Winter-Spring, 1964).

Filep, R.T. "View from the terminal frame," AV Communication Review, 12:205-9 (Summer, 1964).

Reynolds, J.H., and Glaser, R., "Effects of repetition and spaced review upon retention of a complex learning task," Journal of Educational Psychology, 55:297-308 (October, 1964).

Platsloff, J. "I^2 = T x PI (instructional improvement=teacher times programed instruction)" Michigan Educational Journal, 42:17 (October, 1964).

Briggs, F.A. "End of teaching's status quo?" The Texas Outlook, 47:24-6 (September, 1963).

Times Educational Supplement, "Man behind the machine" 2498:721 (April 5, 1963).

Ingraham, Leonard W. "Programed Instructional Materials in Social Studies: 1964," Social Education, Vol. XXXIX, No. 1 (January, 1965).

3. Third Annual Convention of the National Society for Programed Instruction

The third annual convention of the National Society for Programmed Instruction was held May 5-8, 1965, in Philadelphia, Pennsylvania. The nature of the papers that were read reflected the nature of the programed instruction articles published during the year: most were concerned with studies of programed instruction implementation in various settings. One of the exceptions to this general pattern was an address by Doctor B.F. Skinner of Harvard University on "The Technology of Teaching." Doctor Skinner told of two studies of atypical learners - one a moron, the other a paranoid - where the use of succesive approximation produced substantial learning of motor skills.

Doctor Jerome P. Lysaught of the University of Rochester spoke on "A Pilot Study on Programmer Prediction Among Classroom Teachers." This talk was especially helpful in terms of the program development phase of the Programed Instruction Project. Among the non-significant predictions of success in programing were:

1. age
2. sex
3. years of teaching
4. neurotic tendencies
5. self-sufficiency
6. introversion

Some predictors of success in programing noted by others were:

1. success in teaching
2. below-average status in neurotic tendencies
3. above-average status in dominance
4. high intelligence quotient
5. high degree of ability in critical thinking
6. high degree of ability to organize and handle detail
7. high degree of verbal ability

A Teacher Institute Day was held on May 7th at the Convention. It was evident that New York City's work with programed instruction in the schools equalled or excelled any other region's involvement. The Coordinator gave a talk on "New York City's Use of P.I., With Emphasis on Reading."

It was noted at the Convention that military and industrial personnel in attendance outnumbered school and college persons. Informal talks with Air Force and business people revealed that these agencies had become interested in programed instruction because they have found it to be one of the most efficient and inexpensive teaching techniques they had employed.

B. Sharing

The knowledge and experience gained through the Coordinator's activities in programed instruction have made it possible to share some findings with a number of interested groups. Talks and demonstrations were given to:

Principals' Conferences

Districts 19 and 20 (March 17, 1965)
Districts 88 and 39 (April 14, 1965)
Districts 53 and 54 (May 27, 1965)

Conventions

Eastern District Area, American Association of Health, Physical Education and Recreation (April 12, 1965)
National Society for Programed Instruction, (May 7, 1965)

CHAPTER III
THE PROGRAMED READING PROJECT

I. OBJECTIVES

There are two principal objectives for the Programed Reading Project:

A. The development of programed reading material for slow-learning pupils in grades 1-6 in the public elementary schools of New York City.

B. The study and evaluation of programed reading material as it becomes available from the publishers.

II. HISTORY

Early in the histroy of the Programed Instruction Project, it became evident that the new technique held some promise for those of our elementary school pupils who had failed to live up to their potential in reading. It is incumbent upon us to study and evaluate any new method, technique, or procedure in the teaching of reading to our slow learning pupils.

At the same time, it was noted that there was scarcely any suitable programed material in reading available from the publishers. What little there was did not seem to fit the needs of our pupils.

Accordingly, a decision was made to undertake a project which would have two phases: (1) the development of an in-house capability in programing, (2) the development of programs in reading to assist slow-learning pupils. Analysis revealed, however, that the undertaking would be an expensive one, especially from the viewpoint of personnel costs.

Beginning in November, 1962, the writing of a foundation proposal for financial assistance to develop programed reading material for slow-learning pupils in grades four, five, and six was begun. Numerous drafts were written, and many persons assisted in their preparation, including Dr. John B. King, Deputy Superintendent of Schools; Mrs. Helene M. Lloyd, Assistant Superintendent, Elementary Division; Dr. J. Wayne Wrightstone, Acting Associate Superintendent, Bur. Ed. Research. The finished proposal was submitted to the Fund for the Advancement of Education. On November 1, 1963, the Acting Associate Superintendent in Charge of the Division of Elementary Schools was notified by that organization that a fund of $150,000 had been granted to the Division for a period of three years to assist in the project.

In January, 1964, the first payment of $50,000 was made and a series of eight five-hour training sessions was given for a group of fourteen Corrective Reading Teachers during February, March, and April. The purpose of the course was to establish a groundwork in programed instruction in general, and to impart a capability in the technique

of programing in particular.

III. DESIGN MODIFICATIONS

In relation to the developmental phase of the Programed Reading Project, the original design called for the training and employment of teachers in programing on out-of-school time. The target population for the project programs was to consist of slow-learners in the upper three elementary school grades.

While the design remains fundamentally the same, several modifications came about between the time of its submittal to the Fund for the Advancement of Education and its implementation in February, 1964:

A. At the suggestion of the foundation officials, the scope of the proposal was broadened to include the development of material for all the elementary grades, instead of just grades four, five and six.

B. Selected elementary school Corrective Reading Teachers who received instruction in the programing are to serve as full-time programers with the Division of Elementary Schools. This replaces the original proposal whereby classroom teachers would be selected to program on time outside of school.

C. The term of the project is from February 1, 1964 to January 31, 1967, rather than from April 1, 1963 to March 31, 1966 as originally planned.

D. Personnel costs for teachers' training time were to be absorbed by the Board of Education. Furthermore, four teacher positions were to be allotted to the Programed Reading Project for a one year period, representing the Board of Education's total contribution to the Project.

IV. PERSONNEL

A. Consultants

In accordance with the terms of the grant, several consultants were engaged to serve in a variety of capacities: to assist in the preparation of the group of teachers to do programing work; to help in the evaluation of commercially-prepared programed reading material; to consult with the Assistant Superintendent supervising the project, with the Coordinator in the formulation and field trials of programed reading material. Consultants serving during 1964-65 were:

1. Programing Consultants

Dr. Donald A. Cook, Director of Programing, Basic Systems, Inc.
Dr. Stuart Margulies, Director of Training, Basic Systems, Inc.

2. Research Consultant

Dr. Josephine A. Piekarz, Associate Professor of Educational Psychology, New York University

3. Reading Consultant

Dr. Nila Banton Smith, Distinguished Service Professor, Glassboro (N.J.) State College

4. Measurement and Evaluation Consultant

Mr. Charles R. Langmuir, Director of Research and Special Projects--The Psychological Corporation

B. Programers

Two of the graduates of the professional course for teacher-programers were selected to become full-time programers on the Programed Reading Project:

1. Miss Florence Rose, Corrective Reading Teacher, P.S. 304, Brooklyn
2. Miss Lily Rubin, Corrective Reading Teacher, P.S. 94, Brooklyn

These teacher-programers were assigned to the Programed Reading Project on September 28, 1964. A third teacher-programer was added to the programing staff as of May 3, 1965:

3. Mrs. Jennie Glass, Reading Improvement Teacher, P.S. 255, Brooklyn

V. PROGRESS TO DATE

A. SELECTION OF READING SKILL, POPULATION

The reading area selected for initial attack is the finding of specifically stated details in printed selections. The initial target population is fourth-grade pupils who are reading one year below the norm for the grade.

B. DEVELOPMENT OF PRETESTS, PROGRAMS

Work on developing a pretest on finding specifically stated noun details was begun in October, 1964. The first draft of the pretest was administered to sixty-three pupils at Public Schools 181 and 206, Brooklyn, on November 6, 1964. This draft consisted of twenty original narrative prose paragraphs about seventy-five words in length. Each paragraph was followed by four questions designed to elicit an answer which had been specifically stated in the prose paragraph. The answers were all nouns, were all factual in nature, and called for no inference or interpretation on the part of the pupils. The content of the twenty original paragraphs dealt with experiences of children with whom urban pupils might identify.

With the cooperation of the field assistant superintendents and school principals, the teacher-programers who had developed the material administered the pretest.

The principal findings were, first, the test was too easy for the on-grade-norm fourth-graders upon whom it was tried. Second, the pupils expressed more pleasure at some of the narrative material than at others. Third, pupils needed specific instruction to refer to the narrative material for assistance in answering the questions. Fourth, the pupils needed more practice in the mechanics of responding before they took the test.

All pupils were permitted to work until finished. The time range for test completion was between nineteen and fifty-two minutes. (See Table I.)

TABLE I

SUMMARY OF RESULTS OF PRETEST DRAFT NUMBER ONE
USING PUPILS READING ON GRADE NORM

	P.S. 181, K. N=31	P.S. 206, K. N=32	Both Schools N=63
Time Range (Mins.)	22-52	19-40	19-52
Median Time	32	27	29
Mean Time	34	28	31
Scores (Max.= 80) Range	34-79	60-79	34-79
Median	72	76	74
Mean	69	75	72

After the data from pretest draft number one were analysed, draft number two was started. On the basis of discussions with reading specialists, the content of the stories was modified to suit more closely the interests of the target population. The target population selected was shifted from fourth-grade pupils reading on grade norm to those one year retarded in reading. Careful analysis of errors on the first draft of the pretest revealed some ambiguities in the questions themselves, and these points were clarified. Readability of the material was carefully controlled throughout by means of the Dale-Chall and Spache Readability formulas. In the introductory part of the second draft, the pupils were directed to re-read the narrative paragraph to help in answering the questions, if necessary. A second sample

paragraph and associated questions were added to insure that the pupils knew how to answer the questions. As in the first draft, the later test elicited only noun details.

The cooperation of the field assistant superintendents, reading consultants, principals and teachers was enlisted in selecting fourth-year classes reading one year below the grade norm. On December 15, 1964, the completed pretest draft number two was administered by the teacher-programers to classes in Public Schools 58 and 77, Brooklyn. Two classes in each school were tested: one normal third-year class, and one fourth-year class reading one year below the norm for the grade. Summary of the results of these tests is shown in Table II.

An item analysis of pretest draft number two revealed that neither type of class (retarded fourth year or normal third) had experienced difficulty in finding the noun details in the context that had been chosen. The retarded classes in both schools did evidence fatigue after about thirty minutes of testing. Toward the later parts of the test, some pupils marked answers indiscriminately.

TABLE II

SUMMARY OF RESULTS OF PRETEST DRAFT NUMBER TWO, USING THIRD-YEAR PUPILS ON GRADE NORM AND FOURTH-YEAR PUPILS ONE YEAR RETARDED IN READING

	P.S. 58, Brooklyn		P.S. 77, Brooklyn		Both Schools	
	Class 3-2 N=29	Class 4-4 N=29	Class 3-1 N=26	Class 4-3 N=31	Grade 3 N=55	Grade 4 N=60
Time Range (Mins.)	25-52	18-55	18-54	10-90	18-54	10-90
Scores (Max.=80) Range	17-77	25-79	18-80	17-80	17-80	17-80
Median	52	54	72	44	62	49
Mean	52	54	66	44	59	49

In view of these findings, it was decided to produce a graded test of ability to find specifically stated details. Vocabulary was held constant at the 2.0-2.6 level to suit the needs of a retarded fourth-year class' independent reading ability. The narrative material, however, was graded in terms of paragraph length, sentence length and construction, and the use of quotes and referents. Whereas the former tests required only noun details, the latest test elicited nouns of different parts of speech, frequently involving more than one word. The number

of test selections was reduced from twenty to twelve to avoid skewing test results because of a fatigue variable. In pretest draft number three, the number of response modes was also increased. Pupils' answers were in the form of multiple-choice and constructed responses.

Pretest draft number three was administered to one class in each of three different schools on February 24, 1965. The schools involved were P.S. 58 and 77, both Brooklyn, and P.S. 20, Manhattan. The classes tested were representative of the target population in that they were all fourth-year classes, and each was one year retarded in reading. Criteria used for selection of the classes were, standardized reading tests scores, principals' estimates, and teacher judgments.

All pupils were permitted to work until finished. The score range for the test was ten to sixty-one. Highest possible score was sixty-nine. (See Table III.)

TABLE III

SUMMARY OF RESULTS OF PRETEST DRAFT NUMBER THREE USING FOURTH-YEAR PUPILS ONE YEAR RETARDED IN READING

Highest Possible Score=69	P.S. 20, Manhattan Class 4-3 N=10	P.S. 58, Brooklyn Class 4-4 N=20	P.S. 77, Brooklyn Class 4-3 N=23
Score Range	27-55	31-61	10-59
Median	45	46	31
Mean	43	46	32

Analysis of test results revealed that pretest draft number three was a valid test of the target population's ability to find stated details in response to specific questions. In addition, the test highlighted some specific weaknesses in certain sub-skills involved in finding stated details. Wherever the language of the question deviated even slightly from that used in the paragraph, for example, error rates were over 50%. The teacher-programers, who had administered the tests, gained further insights into sources of error when they interviewed selected pupils who had taken the tests. Five children in each of two schools, P.S. 58, Brooklyn, and P.S. 77, Brooklyn, were interviewed individually and were encouraged to reveal the thought patterns that had led to their errors. This information was very useful in the formulation of objectives and in later programing efforts.

A task analysis for programing was formulated; it included the following behaviors:

Child selects important, or "key" word from question.
Child forms mental image of key word.
Child looks back to paragraph.
Child matches key word(s) from question to those in paragraph.
Child examines sentence in which key word(s) appears to find answer.

Several short programs were drafted and tested on individual pupils in P.S. 94, 304, and 309, Brooklyn. They were designed to teach the ability to discriminate between "key" words and unimportant words, in accordance with the above task analysis. Several promising sequences were produced, although use of the word "key" in this connection was dropped because the symbolic "key" could not be divorced from the concrete "key" in the children's thought processes. One of the more promising sequences involved the use of signs, such as "Stop Here," but the use of the term "key word" led to poor results. Consultation with Programing Consultant Doctor Stuart Margulies confirmed the appropriateness of the "sign" technique and this will be explored further.

Consultation with Doctor Josephine Piekarz confirmed the judgment that, in our approach to the problem of selection of details, the details should not be classified according to part of speech. Doctor Piekarz suggested that the third and fourth entries in the task analysis, i.e., "looking back" and "matching", are of paramount importance, and that the first two behaviors may be developed while the third and fourth are being taught via the program.

During May, 1965, the teacher-programers again tested and interviewed pupils on an individual basis to determine how pupils reading on the grade norm went about finding answers to specific questions dealing with a given selection. The subject matter was within the children's reading level, but not within their experiential level. This was done deliberately so that, in most cases, they were obliged to "look back" for answers. These interviews confirmed the importance of the "matching" and "looking back" sub-skills, and programing for these behaviors was begun.

A pretest on matching given words was developed and administered to normal fourth-year classes for the purpose of establishing time norms. Plans were made to administer the same test to children in the target population (fourth-year children, one year retarded in reading) as a prelude to giving them the "matching" program which has also been developed.

C. EVALUATION OF PROGRAMED READING MATERIAL

1. The Sullivan Associates' program, Programmed Reading, was introduced in nine schools in November 1963. During the course of the year, two of the first-year classes dropped the use of the material. Of the remaining seven classes, six were promoted intact to the second grade in June 1964, with the cooperation of the principals and Assistant Superintendents, for the purpose of giving the pupils an opportunity to finish the series of fourteen booklets. Those classes were in P-6-M, P-161-M, P-138-X, P-209-K, P-236-K, and P-284-K. The seventh class (in Public School 69, Queens) completed the first series of fourteen booklets by June 1964.

   As an evaluative measure, the Gates Primary Reading Tests (Word Meaning and Paragraph Reading) were administered to the programed classes and to the next class on the grade using a basal series. The tests were given to the classes in P.S. 69, Queens, in June 1964, and to the other classes during the Spring, 1965, term. An analysis of test results showed no significant difference in achievement between the programed classes and the basal reader series, as measured by the Gates tests.

2. In cooperation with Deputy Superintendent Joseph O. Loretan, the Division of Elementary Schools distributed copies of the program, Building Reading Power to the elementary schools. They were used in almost all elementary schools, in grades 4,5 or 6, or some combination of these grades. The school Reading Improvement Teachers were instructed in the use of the material, and the pupils began the program in the Spring, 1965, term.

   Data on the program were requested from the teachers and from the Reading Improvement Teachers. These evaluations were arriving at the Elementary Division as this report was being written.

VI. NEXT STEPS

A. Production

1. The first sequence of frames on matching words will be field tested by June 30, 1965.

2. The second sequence-on selecting important words-is in production and will be tested on individual pupils during June, 1965.

3. The complete program on finding specifically stated detail will be completed during the fall term, 1965, and will be field tested early in 1966.

4. Concurrent with Item 3 above, preliminary work will be done on a program to help retarded pupils find details which are stated through synonyms; later, those in which inferences are made.

5. Preliminary steps in programing for grades 1-3 will be taken beginning September, 1965.

B. Personnel

1. The full salary of the four programers who will be working on the project during 1965-66 will be drawn from Foundation Funds (Lily Rubin, Jennie Glass, and 2 additional teacher-programers.)

2. One-half the salary of the Principal Investigator will also be paid from Foundation Funds (Robert J. Fanning).

C. Program Evaluation

1. Commercially-prepared programed material in reading will be evaluated in selected schools as it appears.

2. Experts in programed instruction will assist in this evaluation.

D. Space

1. Adequate, quiet work space must be found for the programers. The space should be contiguous with the quarters of the Principal Investigator to make consultation more efficient.

2. Adequate space must also be found for a full-time secretary as originally planned in order to avoid delays in the mechanics of program production.

3. Storage space for files and reference books is also needed.

VI. SUMMARY COMMENT

A. The project, as evidenced by the accompanying material, has moved ahead effectively.

B. We expect that our production rate will equal or excel that of the other programers who developed reading materials over a four-year period for use in our schools. (Junior High School Project)

C. Field testing has shown that children have a great interest in the material being developed. Teachers and supervisors are very interested in using the materials.

APPENDIX A

A P P E N D I X A

Magazine Articles, Periodicals, Research Reports on Programed Instruction

1. Alter, M., Eigen, L. and King, S. "The Effectiveness of Confirmation Plus Trinket Reinforcers in Young Children." Report to the Fund for the Advancement of Education. New York: The Center for Programed Instruction, 1962. (Mimeographed.)

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8. Board of Education of the City of New York, Bureau of Audio-Visual Instruction, The Machine in Programmed Instruction.

9. Board of Education of the City of New York, Bureau of Curriculum Research. The Development and Evaluation of Programed Spelling. A Progress Report. New York: Board of Education. October 15, 1960.

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18. Crowder, N.A. "The Case for Branching," Administrative Management Magazine.

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21. Eigen, L. "High-School Reactions to Programed Instruction," Phi Delta Kappan, March, 1963.

22. Eigen, L.D. and Komoski, P.K. "Teaching Machines Can Aid the Schools to Make Better Use of Teacher's Time," California Journal of Secondary Education, April, 1960, pp. 252-4.

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APPENDIX B

A P P E N D I X B

PROGRAMS ON HAND

ART

1. Introduction to Color Concept, Graflex, Grades 5-6

INSURANCE

1. Your Life Insurance, Tutortext, Doubleday, College-Adult

LANGUAGE ARTS

Grammar

1. English 2600, Blumenthal, Harcourt, Brace & World, Grades 9-10
2. English 3200, Blumenthal, Harcourt, Brace & World, Grades 11-12
3. Modern English: Punctuation, TMI Grolier, Grades 7-College
4. English Grammar, Univox, Universal Electronics Laboratories
5. Programmed English, Sullivan, M.W.; Macmillan, Secondary-College
6. Progress Pak, Pak Donald Publishers
7. English 900, Macmillan, Grades 4-6
8. Scientific Program in Grammar and Usage, Blumenthal, Harcourt Brace & World

Reading

1. Words, A Programed Course in Vocabulary Development, Markle, Susan; Science Research Associates, Grades 7-9
2. Word Clues, Taylor, et. al.; Educational Developmental Laboratories, (Book G), Grades 7-13
3. Context Clues, J.H.S. Division, N.Y.C. Board of Education, Grades 7-9
4. Phonics for Pupils, Sections I & II, Bondanza, W., Bacci, W., Croft Educational Services, elementary grades
5. The Meaning of Modern Poetry, Tutortext, Doubleday, College-Adult
6. Basic Sight Vocabulary, E-Z Sort Systems, elementary grades
7. The Use of Dictionary Guide Words, Graflex, Grade 4
8. Learning How to Use the Dictionary, McEvoy, P., Macmillan Co.

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9. Persuasive Words, Bolt, Beranek & Newman, (for use in "Honor" teaching machine), Grades 8-13

10. Programed Primer, Sullivan Associates, McGraw-Hill Book Company, Inc. Kindergarten-Grade I

11. Programmed Reading, Books 1-18, Sullivan Associates, McGraw-Hill Book Company, Inc., Kindergarten-Grade 2

12. Reading: A Programed Primer, TMI Grolier

13. How to Improve Your Reading, Coronet, Grades 7-9

14. Steps to Better Reading, Harcourt Brace and World, Grades 7-8

15. Programed Pre-reading, McGraw-Hill, Pre-reading

16. Reading Literature, Spacks, et al., Harcourt, Brace & World

17. Your Study Skills, Coronet, Grades 7-12

18. Michigan Successive Discrimination Language Program, Smith, D. and Kelingos, J.M. Primary Grades

19. Building Reading Power, Charles . Merrill Books, Inc., 15 volumes Grades 7-9

20. The Letters and Sounds in Words, Parts I and II, Ginn and Company, Middle Grades

21. David Discovers the Dictionary, Coronet, Grades 4-6

LAW

1. Practical Law, Tutortext, Doubleday, College-Adults

LOGIC

1. Basic Symbolic Logic, Radio Corporation of America, College-Adults

2. Programed Modern Arithmetic: Logic, D.C. Heath and Co.

MATHEMATICS

1. Practical Mathematics, Tutortext, Doublday, College-Adults

2. Adventures in Algebra, Tutortext, Doubleday, Secondary-Adults

3. Arithmetic of Computers, Tutortext, Doubleday, College-Adults

4. Mathematics Enrichment, Programs A, B, C, Sets, Geometry & Numeration, Spooner, G., Harcourt, Brace & World, Grades 4, 5, 6

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5. Business Mathematics (Part II), Huffman, McGraw-Hill Book Company, Inc., Secondary-Adults

6. Number Systems, Rudd, Ridlon & Smith, Harcourt, Brace & World, (pre-publication draft),

7. Squaring Numbers Ending in 5's, Devereux Foundation (machine use)

8. Subtraction, Astra Corporation, (use in Autoscore machine)

9. Fractions, Astra Corporation, (use in Autoscore machine)

10. Decimals, Astra Corporation, (use in autoscore machine)

11. Basic Computer Programming, Tutortext, Doubleday

12. An Introduction to Sets, Rudd, Ridlon & Smith; Harcourt, Brace & World, (pre-publication draft), grades 4, 5, 6

13. Prime Numbers and Factoring, Rudd Ridlon & Smith; Harcourt, Brace & World, (pre-publication draft), Grades 4 and 5.

14. Independent Growth in Mathematics, J.H.S. Division, N.Y.C. Board of Education, Grades 7-9

15. An Introduction to Proper Fractions, Rudd, Ridlon & Smith; Harcourt Brace & World, Grades 4-6

16. Fractions With Meaning, Ficks, I., Croft Educational Services, Grades 4-6

17. Multiplication and Division Facts, Volume I, TMI Grolier

18. Multiplication and Division Facts, Volume II, TMI Grolier

19. Elementary Arithmetic: Introduction to Numbers, TMI Grolier (for machine use)

20. Time Telling, TMI Grolier, (for machine use)

21. Elementary Arithmetic: Decimal Numbers, TMI Grolier

22. The Slide Rule, Tutortext, Doubleday

23. Arithmetic, Univox, Universal Electronics Laboratories

24. Number Bases and Binary Arithmetic, Learning Incorporated, Coronet Instructional Films, Grades 8-10

25. Addition of Like Fractions, Graflex, Grade 5

26. What Are the Chances? An Introduction to Probability, Moskowitz, Macmillan, Grades 9-12

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27. Points, Lines and Planes, An Introduction to Geometry, Ranucci, Macmillan, Grades 9-12

28. Self-Teaching Arithmetic, Books 1 and 2, Studebaker & Studebaker, Scholastic Book Services

29. Time Telling, Kuehne, Graflex, Grade 2

30. Estimation, Liberman, McGraw-Hill, Grades 7-9

31. Measurements, Liberman, McGraw-Hill, Grades 7-9

32. Arithmetic Facts, Graflex

33. Computing the Square Root, Graflex

34. Learning about Fractions, Graflex

35. Multiplication, Graflex

36. Perimeter, Graflex, Grade 5

37. Introduction to Probability, Gratin, Graflex

38. Number Bases and Binary Arithmetic, Coronet, Grades 8-10

39. Equations and Inequalities, Nichols, et al., Holt, Rinehart & Winston, High School and College

40. Progressive Elementary Mathematics, Banghart, Noble and Noble

41. Programed Problem Solving, King, Ginn and Co., Grades 2 and above

42. Developing Mathematical Understanding, Bruckner, et. al., Holt, Rinehart and Winston, Grades 4-5

43. Elementary Mathematics, TMI Grolier

44. Fractions, Basic Concepts, TMI Grolier

45. Introduction to Modern Mathematics, TMI Grolier

46. Programed Modern Arithmetic, Vols. 1-3, D.C. Heath

47. Introduction to Multiplication, Armstrong, McGraw-Hill

48. ASMD Addition, Hancock and Holden, Behavioral Research, Addison-Wesley

49. ASMD Subtraction, Hancock and Lucas, Behavioral Research, Addison-Wesley

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50. ASMD Multiplication, Hancock and O'Brien, Behavioral Research, Addison-Wesley.

51. ASMD Division, Hancock and Schneider, Behavioral Research, Addison-Wesley

MUSIC

1. Fundamentals of Music, TMI Grolier, (for machine use)

PROGRAMED INSTRUCTION

1. P.I., Programed Instruction, What It Is and How It Works, Milton and West, Harcourt, Brace & World

2. Explaining "Teaching Machines" and Programing, Cram, D., Fearon Publishers

3. Preparing Objectives for Programed Instruction, Mager,R. Fearon Publishers

4. A Programed Primer on Programing, Markle, Eigen & Komoski

5. Introduction to Your Push Button Teaching Machine--The How, What, and Why of Programed Instruction, Bolt, Beranek & Newman (for machine use)

PSYCHOLOGY

1. The Analysis of Behavior, Holland, R. & Skinner, B.F., McGraw-Hill Book Company, Inc., College-Adult

2. Biological Basis of Behavior, McGuigan, Prentice-Hall

SCIENCE

1. A Program on Earth-Sun Relations, Saveland, R., Ginn & Co., Grade 6

2. Linear Motion, Trout, J., Croft Educational Services, Secondary

3. Our Solar System, Learning Incorporated, Corenet Instructional Films Grades 7-9

4. What is a Mammal? Learning Incorporated, Coronet Instructional Films, Grades 5-6

5. Classification of Plants, The Phylum, Graflex, Grades 7-8

6. Life Cycles of Insects, Graflex, Grades 7-8

7. Introduction to Entomology, Graflex, Grade 6

8. Trees, Graflex, Grades 5-6

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9. Amphibians and Reptiles, Bolt, Beranek & Newman; Grades 6-11, (for machine use)

10. Matter in Motion, Accelerated Instruction Methods Corp., Grades 7-9

11. Chemistry Concepts: The Molar Method, Learning Incorporated, Coronet Instructional films

12. What is a Mammal? Coronet, Grades 7-8

13. Cells-their Structure and Function, Zoboskam and Meade, Coronet, Grades 9-10

14. Predicting Weather, Kuehne, Graflex, Grade 5

15. Chemistry--Atomic Structure and Bonding, Dawson, Basic Systems, High School

16. The Night Sky, Sullivan, McGraw-Hill

17. Programed Astronomy, Sullivan, McGraw-Hill, Grades 7-9

18. The Solar System, Sullivan; McGraw-Hill

19. General Science, Motion, Macmillan, Grade 2

20. Sharing the Earth's Surface, Krause, Graflex, Grades 4-6

21. How We Forecast the Weather, Donald Erger, Coronet, Grades 4-6

22. How Scientists Think and Work, Munch and Zaborska, Coronet, Grades 5-7

23. Force, Programed Learning Laboratories, Macmillan

24. Energy and Work, Programed Learning Laboratories, Macmillan

25. Simple Machines, Programed Learning Laboratories, Macmillan

26. Levers, Graflex

SOCIAL STUDIES

1. Latitude and Longitude, Learning Incorporated, Coronet Instructional Films, Grade 6

2. Programmed Geography, The Earth in Space, Buchanan, C.D., Macmillan Co., Grades 4-6

3. Programmed Geography, Continents and Oceans, Buchanan, C.D., Macmillan Co., Grades 4-6

4. Programmed Geography, Latitudes and Climates, Buchanan, C.D., Macmillan Co., Grades 4-6

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5. Maps:- How We Read Them, Haring, Coronet, Grade 6

6. This is America's Story, Anderson, Houghton-Mifflin, Grades 7-8

7. Bill of Rights, Learning, Inc., Coronet, Grades 6

8. The Constitution, Ginn and Co., Grades 8 and above

9. China, Soens, et. al., Holt, Rinehart Co.

10. American Government, Rosenhack, Behavioral Research Labs.

11. The United States Constitution, McCloskey, Behavioral Research Labs.

12. Geography of the United States, MacGraw and Williams, Behavioral Research Labs., Grades 7-9

13. The Big City, General Programmed Teaching Corporation, Ginn & Co.

14. The Changing City, General Programmed Teaching Corporation, Ginn & Co.

15. Our Earth and the Universe, Pierlon, Ghedi, Graflex, Grade 9

16. Reading Latitude from Maps, Koehrer, McGraw-Hill

17. Reading Longitude from Maps, Koehrer, McGraw-Hill

SPELLING

1. Spelling, TMI Grolier, Volumes 1-3

2. Spelling, Univox, Universal Electronics Laboratories

3. Spelling Demons, Alexander, Cenco

4. Basic Plan of Presentation to Teachers, Programed Spelling, Noble and Noble

APPENDIX C

P.I. 4 (Revised 9/65)

BOARD OF EDUCATION OF THE CITY OF NEW YORK
OFFICE OF INSTRUCTION AND CURRICULUM
110 Livingston Street . Brooklyn, New York 11201

PROJECT: PILOT STUDY OF PROGRAMED INSTRUCTION

Participating School_____ Borough_____ Principal_____

Teacher_____ Class_____

Name of Program_____ Date of Report_____

TEST RECORD

Pupil's Name List Boys 1st, Girls 2nd Last Name, 1st Initial	Birth Date Month Year	Reading Level (Stand. Test or T. Judgement: Readiness, Pre-Primer, 1^1, 1^2, etc.)	Pre-test Score	Pre-test Date	Hrs.Mins. on Program	Post-test Score	Post-test Date	Comments

P.I. 4 Test Record

Pupil's Name List Boys 1st, Girls 2nd Last Name, 1st Initial	Birth Date Month Year	Reading Level (Stand. Test or T. Judgement: Readiness, Pre-Primer, 1^1, 1^2, etc.)	Pre-test Score	Pre-test Date	Hrs.Mins. on Program	Post-test Score	Post-test Date	Comments

PI 9

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street . Brooklyn 1, New York

QUESTIONNAIRE FOR TEACHERS*
PROGRAMED INSTRUCTION

(To be completed after teacher has administered programed material.)

Teacher's Name_____ School_____ Borough_____

Class_____ Date of Report_____ Which program(s) of instruction

- -

A. Use of Programed Material

I. What use did you make of the program in your class? Please check one or more: (a) Basic Text___; (b) Supplementary____; (c) Enrichment_____; (d) Remediation ___; (e) Homework____, (f) Other (specify)_____

_____

Comments:_____

_____

_____

II. With which pupils did you use the program? Please check one or more:

(a) Entire class___; (b) Small group _____ (Whom?)_____

(c) Individuals_____ (Whom?)_____

Other (specify)_____

Comments_____

_____

III. How did you allow the program to be used? Please check one or more:

(a) In class, under my direct supervision_____; (b) In standard amounts of class time (If so, how long were the periods? About how many days per week?)_____;

*For any assistance in answering this questionnaire, call Mr. Robert Fanning, ULster 8-1000, Ext. 247.

III. (Continued)
(c) In class, as a spare-time activity following completion of other work of the day____; (d) For homework, with prescribed amounts to be done by pupils____; (e) For homework, with no limitations on amount to be done____.
(f) Other (specify)_____

_____

Comments:_____

_____

IV. If you were to administer this program to another class of about the same characteristics as this one, what changes would you make in the uses the pupils made of it? (Why?)_____

_____

_____

B. Content of the Program

I. Do you consider the learning material in this program as appropriate to the grade? (a) Yes____; (b) No____ (Why not?)_____

_____

II. Would you recommend the use of this program to pupils on the same grade, but of a different ability level? (a) Yes____(Which level?) (Characterize as high, medium, low)_____; No_____

III. Would you recommend the use of this program in another grade, or with a certain group in another grade? (a) No___;(b) Yes____ (Which?)_____

_____

Comments:_____

_____

IV. Please give your judgment about the reading level of this program:

(a) Too low for this class____; (b) Just about right_____; (c) Presented some difficulty for some pupils _____; (d) Presented some difficulty for all Pupils____; (e) Altogether too challenging for independent work by these pupils____ Comments:_____

_____

V. Step Size: please give your opinion about the gradation of difficulty between the frames of this program: (a) In general, the step size was so small it constituted a waste of time for the pupils____; (b) In general, the step size was just about right____; (c) There were places in the program where many pupils experienced difficulty_____ (Where?)_____

_____

(d) In general, the step size was too great for this class_____ (e) Other _____ (Specify)_____

_____

(f) Comments:_____

_____

- -

C. Pupil Reactions

I. What difficulties, if any, did the pupils have in handling the program (e.g., manipulating slider, turning pages, using answer sheet, using Pupil Time Record Sheet)?_____

_____

Were these difficulties overcome? How did you effectuate this?_____

_____

II. Did "cheating" (peeking ahead at the answers) present a problem? No_____ Yes_____ Comments_____

III. Please characterize the pupils' application to their program (in terms of "attention"): (a) Complete boredom_____ (if so, why do you think they were bored?)_____

(b) Frequent daydreaming_____ (if so, why?)__ _____

_____; (c) About the ame application I have observed to regular textbooks or workbooks__ __; (d) Intense application at first, with a later drop-off_____(To what o you attribute this?)_____

_____ _____

(e) A general, intense application to the programed work_____ (If so, how would you explain it?)_____ _____

_____ _____

Comments: (It would be helpful if you could cite specific comments by pupils in this regard.)_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

D. General

I. Have you formed an opinion at ut programed instruction as an educational technique? Please check one one: (a) No_____; (b) Too early to tell; would need more experience_____; (c) Yes_____(If so, what is your opinion?)

_____

_____

_____

_____

_____

PI 9, Questionnaire for Teachers (Continued)

II. Prior to the start of this project, what has been your experience with programed instruction? Please check one or more: (a) No prior knowledge____; (b) Have read articles in popular press_____; (c) Have read articles in professional magazines, journals, reports, publications____; (d) Have attended lectures, panels, demonstrations on P.I.____; (e) Have participated in a course on P.I.____; (f) Have used programed material in class_____; (g) Have formulated, or participated in the formulation of a program_____; (h) Other (specify)_____

III. What would you say is the single greatest disadvantage or limitation of programed instruction?_____

What would you say is the single greatest advantage of programed instruction?_____

IV. What has been the nature of parents' reactions, if any, to the programed material?_____

THANK YOU FOR ANSWERING THIS QUESTIONNAIRE. IT WILL BE OF GREAT ASSISTANCE IN REACHING DECISIONS ABOUT THE FUTURE ROLE OF PROGRAMED INSTRUCTION IN OUR ELEMENTARY SCHOOLS.

P.I. 10

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street . Brooklyn 1, New York

PUPIL QUESTIONNAIRE

This is not a test — it is only a list of questions about your feelings about the new kind of book you have been using.

Please answer the following questions as well as you can. We need your help. If a question is hard to understand, please ask your teacher for help.

Boy__________ Girl__________ Class______ School________ Borough________

- -

1. In general, did you understand the programed lessons? Circle one of these answers.
   - always
   - most of the time
   - sometimes

2. Do you think the programed books helped you to understand your work better? Circle one answer.
   - very much
   - much
   - a little
   - not at all

3. Check any of the following things you liked about the book:

   _____ I learned things by myself.

   _____ I got so many right answers.

   _____ I knew right away when I got the right answer.

   _____ There were some funny parts in the book.

   _____ I could go along as fast or as slowly as I wanted.

4. Check any of the following things you did not like about the book:

   _____ It was boring.

   _____ I didn't learn anything.

   _____ It was too hard.

   _____ It was too easy.

   _____ It was hard to keep track of my place in the book.

   _____ I like our regular lessons better.

5. Would you like to use more books of this kind? Circle: Yes No

   Why?____

PI 62 (Rev.)

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY DIVISION
110 Livingston Street Brooklyn, New York 11201

November, 1964

To: Principals and Teachers in the Programed Instruction Project

From: Robert J. Fanning, Project Coordinator

Re: Teacher's Guide, Learning How to Use the Dictionary

I. HIGHLIGHTS OF THE PROGRAM

A. Learning How to Use the Dictionary was programed for the Macmilliam Company by Behavioral Research Laboratories, a group of content experts, educators and psychologists who work with various college and university consultants to develop programed material. Paul Mc Evoy of Indiana University is principal author of the program.

B. The program is designed specifically to accompany Webster's New World Dictionary, Elementary Edition. The program cannot be used effectively without the dictionary. Pupils are required by the program to consult their dictionaries more than 360 times.

C. The programed book is consumable. Pupils may write their answers in the spaces indicated in the books.

D. A slider for use in concealing and revealing answers is attached to the back cover. In the event of loss any similar piece of cardboard or oaktag will suffice.

E. Learning How to Use the Dictionary contains 245 frames, exclusive of review frames. Pupils can do up to 100 frames per hour; although this would be unusual, pupils performing at that rate could be finished in under three hours' time. If the program is used daily for twenty minutes, most of the class will be through it in about two weeks.
(See "Suggestions for Use" for details.)

F. This program is designed to teach two things in general:
   a. The basic skills necessary to find words in the dictionary.
   b. The use of the dictionary for help in definitions, spelling, and writing.

Detailed objectives are listed in the Table of Contents of the pupils' books.

II. SUGGESTIONS FOR USE IN NEW YORK CITY

A. Grade Level-Suggested use level for this program is Grade 4. Most of the children will have had some Grade 3 experiences with the first few topics in the program, i.e., alphabetizing by one or two letters. Many of the objectives of the program are also expected outcomes of the language arts program for grades 3-4. (See Curriculum Bulletin Number 4, 1954-55 Series, Course of Study,

Language Arts, Grades 1-6, pp. 12, 51.) Successful use of the program will take the pupils into some of the expected learnings for grades 5-6.

B. Kinds of Use- To provide for consistency in use, teachers are advised to use the program for twenty minutes per day for three days each week until all pupils finish the program. For purposes of this study, restrict the use of this program to the classroom, under timed conditions. Each child is to proceed at his own rate. Do not attempt to keep all the pupils at the same place in the program.

Each child under these conditions will complete the program at a different time. We are interested in knowing how long each child requires to complete the program. To facilitate this, instruct each pupil to bring the program to you as soon as he finishes it. Mark the date in the inside cover as the child brings it to you. Compute the number of days (three days per week) since the class started in the program, multiply by twenty (twenty minutes a day) and enter the total on the Test Record Sheet.

C. Role of the Teacher--There are five principal aspects to the teacher's role in this program (some others may emerge as a result of this study):

1. Initial Preparation of Records--Prepare the "Test Record" sheet. Enter:
    a. Pupil's Name
    b. Birth date
    c. I.Q. (if available)
    d. Reading level

2. Teacher Preparation
    a. Read carefully pages one and two of the Teacher's Manual.
    b. Read the pupil's booklet.

3. Pretest- Find out prior knowledge the pupils are bringing to the program by giving them a pretest before they begin work on the program.
    a. Distribute Test Booklet for Learning How to Use the Dictionary.
    b. Have pupils remove pages one through seven by tearing along dotted lines.
    c. Have pupils remove pages fifteen through twenty-one by tearing along dotted lines.
    d. These two tests together (pages1-7 and 15-21) form the pretest. Staple or otherwise fasten these sheets together and instruct pupils to enter name, class and date in upper left-hand corner of the page one.
    e. Reduce pretest anxiety by assuring the pupils that you do not expect them to know all, or even half of the answers. Tell them that the pretest score will not affect their class marks or report card marks.

Dictionaries (Webster's New World Dictionary,

Elementary Edition) should be on the desks as pupils take the test.

f. Collect the Test Booklets, which still contain "Progress Tests, Form B." These will be used later as the Posttest.
g. Administer the Pretest. Allow all the time needed for all pupils to finish.
h. Score the pretest. Each correct part of each answer receives one point. Where pupils are required to place words in alphabetical order, score one point for each word which is placed in alphabetical order. Top score possible is 98. Enter pretest scores on Test Record Sheet.

4. Pupil Preparation

a. The Mechanics of Program Use-After the pretest is completed, instruct the pupils in the use of the program. They should be familiar with the use of the slider to conceal and reveal answers.

They should know that they are to check the accuracy of each response immediately after writing it. They should practice slipping the slider into the next page before turning the page, in order not to reveal the answers inadvertently.

b. Psychological Preparation-Pupils should be reminded that the program is not a test, and that no one will mark the program. They should understand that there is no advantage to be gained in peeking ahead at an answer before they have written their own response. If they make a mistake, they should draw a line through the incorrect answer and next to it write the correct one. Some pupils do not understand that they are learning when they get so many correct answers; they should be reassured on this point. Finally, they should understand that, while the teacher is timing each of the twenty-minute periods, we are not conducting a race, that there is no reward for finishing first.

The section entitled "To the Student" (pp. i, ii, pupils' book) may also be used in this important phase of pupil preparation.

5. Administration of the Program-Especially in the initial parts the teacher should assist the pupils in the mechanics of answering. Once they have started, allow them to become as self-sufficient with the program as possible. Let the program carry the burden of the teaching. It is very important that the pupil remain confident of his ability to solve the problems himself, and hints which are too frequent or too broad can make him lose sight of the fact that he is advancing by exercising his own intellectual capacity.

6. Posttesting-Each pupil should be tested as soon as he finishes the program. (Do not wait for the whole class, or a group of pupils, to finish before testing.) As each pupil finishes give him a copy of the Test Booklet for Learning How to Use the Dictionary. Have him take Progress Tests, Sections I

and II, Form B, pp. 8-14, 22-27. Again there is no time limit.

Score the posttest. Each correct part of each answer receives one credit. Top possible score is 93. Enter posttest marks on Test Record Sheets.

7. Completion of Records

a. Pupil Questionnaire- As he finishes, each child should complete a copy of the Pupil Questionnaire. Complete frankness is solicited. Pupil returns questionnaire to teacher as soon as he finishes it. Please note: pupils' names are not to be shown on questionnaire. It is hoped that anonymity will elicit further candor.

b. Questionnaire for Teachers- When all tests have been completed, teacher is to fill out "Questionnaire for Teachers." This questionnaire may prove to be the most valuable part of the Programed Instruction Project. Therefore, candor and full answers are requested.

c. Submittal of Records- Upon completion of the above, send to the Principal:

1. Test Record Sheet
2. Pupil Questionnaires
3. Questionnaire for Teachers

The programs may be retained in the classroom for purposes of review.

P.I. 78

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street Brooklyn, New York 11201

January, 1965

To: Selected Principals and Teachers in the Programed Instruction Project

From: Robert J. Fanning, Project Coordinator

Re: Teacher's Guide, Time Telling

I. HIGHLIGHTS OF THE PROGRAM

A. Published material for use with this program are:
1. Programed booklet (Time Telling).
2. Pretest (pp. 30, 31, 32) of the programed booklet.
3. Cardboard masks for concealing answers and to help pupils keep their place (large blue perforated sheets).
4. Cardboard clocks for individual pupil use while doing the program.
5. Teacher's Manual

B. Materials furnished by the Elementary Division for use with the program are:
1. (35) Test for Time Telling (P.I. 63).
2. (1) Test Record (P.I. 4).
3. (35) Pupil Questionnaire (P.I. 10).
4. (1) Questionnaire for Teacher (P.I. 9).
5. (1) Teacher's Guide, Time Telling (P.I. 76).

C. The programs are consumable. Pupils may write answers directly in the spaces provided in the programed book.

D. Prerequisites (adapted from Teacher's Manual, Time Telling). Before doing the program, the pupils should:
1. Be able to read at or above the 2.0 reading level.
2. Know that a clock is a device for telling time.
3. Be able to count to twelve.
4. Understand what "half a circle" is.
5. Understand certain other vocabulary items (see p.11, Teacher's Manual).
6. Be motivated to learn how to tell time.

E. Objectives - The pupil is taught by means of this program to tell time on the hour and half hour.

F. Duration - Time Telling is a very short-term program which will be completed in between 60 minutes to 120 minutes, depending on teacher use and pupil ability. Pupils should not, of course, attempt to finish the program in one sitting.

II. SUGGESTIONS FOR USE IN NEW YORK CITY

A. Grade Level - Suggested use level is Grade 2. Concepts of time by the hour and half hour are indicated for development in Grade 2 in the Mathematics 1-2 bulletin (p.44).

B. Kinds of Use - This program may be used for whole-class instruction, for small groups or individual instruction. Some bright, highly-motivated pupils, if given free rein, could complete the program in an hour. It is suggested that the program be used for periods not in excess of 10-15 minutes at a time, two or three times a week. Teacher's experience with her pupils will dictate the duration of subsequent exposures. At any rate, it will be of interest to determine the time spent by each pupil on his program. This can be done by making note in the teacher's plan book of the time spent on the program at each session. As each child finishes the program, mark the elapsed time in the front cover. Total working time for each pupil can then be entered on mimeographed "Test Record" sheet as each child finishes the program.

C. Teacher's Role - There are five principal aspects to the teacher's role in this program (some others may emerge as a result of this study):

1. Initial Preparation of Records - Prepare the "Test Record" sheet. Enter:
   a. Pupil's name
   b. Birth date
   c. I.Q. (if available)
   d. Reading level
2. Teacher Preparation
   a. Read Teacher's Manual.
   b. Examine the program (Pupil's booklet).
   c. Arrange to have clock face and hands cut out and assembled. (Class may do this if teacher wishes.)
   d. Separate sliders from blue, perforated sheets. Place one in each program.
3. Pretest - Find out prior knowledge the pupils are bringing to the program by giving them a pretest before they begin work on the program. If a pupil scores very well on the pretest, it means he will gain little or nothing through use of the Time Telling program.
   a. Distribute mimeographed tests, Test for Time Telling. Have pupils print their name and the date on the first page. Each child should have a strip of cardboard or paper to use as a marker.
   b. Turn to page nine of the Teacher's Manual. Administer pretest by reading instructions on page nine to the pupils. There is no time limit. Allow plenty of time for each child to answer.
   c. Reduce pretest anxiety by assuring the pupils that you do not expect them to know all, or even half the answers. Tell them that the pretest score will not affect their class marks or report card marks.
   d. Collect pretests and score them. Score one point for each correct answer. No partial credit is to be given. If any part of any answer is wrong, give no credit. Highest possible score is twenty. Enter pretest scores on "Test Record" sheet.
4. Pupil Preparation
   a. The Mechanics of Program Use - The pupils should be familiar with the use of their programs, especially methods of answering and use of the slider.
   b. Psychological preparation - Pupils should be reminded that the program is not a test, and that they will not be marked on it. They should understand that there is no advantage to be gained in peeking ahead at answers before they have written their own response. If they make a mistake, they should draw a line through the incorrect answer and write down the correct one.

Some pupils do not understand that they are learning when they get so many correct answers; they should be reassured on this point. Finally, they should learn that the programs were designed for individual use; each pupil should proceed at his own pace. No premium is placed on being first to finish.

5. Administration of the Program - Especially in the initial parts, the teacher should assist the pupils in the mechanics of answering. Questions about the content may be answered by giving hints. It is very important that the pupil remain confident of his ability to solve the problems himself, and hints which are too frequent or too broad can make him lose sight of the fact that he is advancing by exercising his own intellectual capacity. Let the program carry the burden of the teaching. During the period of program use, let the program be the sole teacher of the topic of time-telling.
NOTE: Disregard instructions on this point on p. 7 of the publisher's teacher's manual.
6. Posttesting; Completion of Records
   a. Posttesting - As soon as each pupil finishes the program, make note of the elapsed time on the "Test Record". As each group of pupils finishes the program administer the posttest. The posttest is the same as the pretest, and it is administered and scored in the same way. No partial credit is to be given. If any part of a response is incorrect, no credit is to be given. Enter scores on Test Record.
   b. Pupil Questionnaire - If, in the teacher's judgment the pupils can respond meaningfully to the pupil questionnaire (P.I. 10), have them fill them out. Complete frankness is solicited. Pupil returns questionnaire to teacher as soon as he finishes it. Please note: pupils' names are not to be shown on questionnaire. It is hoped that anonymity will elicit further candor.
   c. Questionnaire for Teachers - When all tests have been completed, teacher is to fill out "Questionnaire for Teachers." This questionnaire may prove to be the most valuable part of the Programed Instruction Project. Therefore, candor and full answers are requested.
   d. Submittal of Records - Upon completion of the above, send to the Principal:
      1. Test Record Sheet
      2. Pupil Questionnaires
      3. Questionnaire for Teachers

The programs may be retained in the classroom for purposes of review.

P.I.101

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street, Brooklyn, N. Y. 11201

April, 1965.

To: Principals and Teachers in the
Programed Instruction Project

From: Robert J. Fanning, Project Coordinator

Re: Teacher's Guide, Coronet Learning Program,
Maps: How We Read Them

I. HIGHLIGHTS OF THE PROGRAM

A. Maps: How We Read Them was programed for Coronet Instructional Films by Learning Incorporated. This program was prepared under the supervision of L. Lloyd Haring, Ph.D., Chairman of the Department of Geography, Arizona State University.

B. The basic objectives of the program are:
1. To give pupils the ability to specify the kinds of information shown on any of the twelve basic types of maps in the program (landform, products, elevation, precipitation, temperature, climate, vegetation, water features, land use, population, political, roads).
2. To provide the ability to describe an area shown on a map, using the map's legend, scale and direction.
3. To develop the ability to search out specific information by finding the appropriate map and using it properly.

C. The programs are not consumable. Answers are to be written on a separate piece of paper or in a notebook. (See "Suggestions for Use" for details).

D. Twelve types of maps are presented in this program. Some are in color.

E. The Answer Panel with its self-contained slider is permanently attached to the program. It serves to conceal the answer to each frame until the pupil has written his own response.

F. Maps: How We Use Them is divided into ten sets of which the last is a review. Each set takes the pupil about fifteen minutes to complete. The program introduces students to many types of physical and cultural maps. The program emphasizes the fun of map reading as well as the skills, by relating the map to plans for a Western Vacation. The review set requires the student to apply what he has learned to a new set of maps different from those used in the rest of the program.

II. SUGGESTIONS FOR USE IN NEW YORK CITY

A. Grade Level - This program was tested following development on groups of 5th and 6th grade pupils. Average readability is 5.2. If, in the opinion of teachers and principals, a school's fifth grade class can handle the program from the reading viewpoint, the program may be used in the fifth grade. Otherwise, the program is to be used in the sixth grade.

B. Kinds of Use - This program may be used for whole-group instruction, for small groups, or for individual instruction. It may be used in school or at home. Bright, highly-motivated pupils, if given free rein, could complete the program in about two hours. At any rate, it will be of interest to determine the time spent by each pupil on his program. Each child can be held responsible for keeping a record of the hours and

minutes on a locally-produced form which can be kept with his answer sheets, or inside the program cover:

Pupil's Name _____ Class _____

Date _____ Pages _____ Hours _____ Minutes _____

Total working time for each pupil can then be entered on completion of the program on mimeographed "Test Record" sheet.

C. Teacher's Role - There are five principal aspects to the teacher's role in this program (some others may emerge as a result of this study):

1. Initial Preparation of Records
   a. Preparation of "Pupil Time Record" sheet for pupil use.
   b. Initial entries in "Test Record" sheet:
      Pupil's name
      Age
      I.Q. (if available)
      Reading level
2. Teacher Preparation
   a. Careful reading of "Foreword" (p.i.) and "To the Teacher" (pp.ii and iii) in the program itself.
   b. Reading of the text itself.
   c. Decision-making, with supervisor's assistance, regarding kinds of use, subject to modification in the light of experience.
3. Pretesting - The "Review and Self-Test (Set 10)" in the program is to be used as a pretest to indicate the prior knowledge which the pupils bring to the program before they begin work on the program. The "Review and Self-Test (Set 10)" has been adapted for this use. Forty copies of the pretest accompany the material distributed at the orientation meeting. (Forty additional copies of the test will be mailed later to the teacher. These mailed tests are to be used as a posttest, and are to be given to each child as he finishes the program.)

   Score one point for each correct answer. If there are several answers for one question, score a point for each answer (e.g., questions 4, 18, 19, 20, 22 and 23 each have two blanks; if the pupil fills in one blank correctly, score one point; if he fills in two blanks correctly, score two points). Top score is 38. Enter scores on "Test Record" sheet.

   Reduce pretest anxiety by assuring the pupils that you do not expect them to know all, or even half of the answers. Tell them that the pretest mark will not affect their class marks or report card marks.
4. Pupil Preparation
   a. The Mechanics of Program Use - The pupils should be familiar with the use of the slides for concealing and revealing answers. They should practice writing each answer before moving down the slides to uncover the correct answer. They should practice moving the slider all the way up before turning the page, to avoid glimpsing

the answer column inadvertently. They should become familiar with the use of their time record sheets, and with the method of responding to the program's questions.

This program is not consumable. Pupils should be instructed to make no marks in the programed booklet. Answers may be written on numbered sheets of lined paper or in a notebook.

b. Psychological Preparation - Pupils should be reminded that the program is not a test, and that they will not be marked on it. They should understand that there is no advantage to be gained in peeking ahead at answers before they have written their own response. If they make a mistake, they should draw a line through the incorrect answer and write down the correct one. Some pupils do not understand that they are learning when they get so many correct answers; they should be reassured on this point. Finally, they should learn that the programs were designed for individual use; the Pupil's Time Record sheet is to help us find out how children learn, and that we have no thoughts of conducting a race.

The Maps: How We Read Them Foreword (p.i) may be used as an aid in this very important phase of pupil preparation.

5. Administration of the Program - Especially in the initial parts, the teacher should assist the pupils in the mechanics of answering and time-keeping. Questions about the content may be answered by giving hints. It is very important that the pupil remain confident of his ability to solve the questions himself, and hints which are too frequent or too broad can make him lose sight of the fact that he is advancing by exercising his own intellectual powers. Pupils may complete the program through Set 9. They are not to complete Set 10 - the Test Set.

6. Posttesting - As soon as each pupil has completed Set 9, he should be given the posttest as a measure of his achievement. The posttest is the same as the pretest, and is to be scored in the same way (see II, C,3, "Pretesting"). Do not wait for the whole class, or a group to finish before giving the test. Give the test to each pupil as soon as he finishes, to avoid holding the "early finisher" at a disadvantage.

7. Completion of Records
   a. Pupil Questionnaire - Upon finishing the program, each child is to fill in the "Pupil Questionnaire." Instruct him not to place his name on the questionnaire. Encourage full, frank answers.
   b. Questionnaire for Teachers - After having administered the program to your class, fill out the "Questionnaire for Teachers." This may well be the most important part of this study. Therefore, full and candid replies are solicited.
   c. Test Record - Check Test Record sheet for complete entries. Assemble pupil questionnaires, questionnaire for teachers and test record, place in envelope, label and send to principal. Collect programs for storage or re-use at direction of principal.

P.I. 104

BOARD OF EDUCATION OF THE CITY OF NEW YORK
DIVISION OF ELEMENTARY SCHOOLS
110 Livingston Street, Brooklyn, N. Y. 11201

April, 1965

To: Selected Principals and Teachers in the Programmed Instruction Project

From: Robert J. Fanning, Project Coordinator

Re: Teacher's Guide, Predicting Weather

I. HIGHLIGHTS OF THE PROGRAM

A. Predicting Weather was programed by Elizabeth Kuehne for Graflex. The program is designed to:
1. Make pupils aware of the weather signs about thdm in order that they may predict the weather without instruments.
2. Enable pupils to predict weather based on an increased awareness of the relationship of cloud formation to weather front formation.
3. Develop an understanding of the manner in which farmers, sailors and others whose work is dependent on weather are able to predict weather.
4. Enable pupils to demonstrate awareness of variations in cloud appearance and vary their own behavior as a result of this knowledge.
5. Enable pupils to use specific terminology when referring to cloud formations and their effect on coming weather.

B. Materials furnished by the Elementary Division for use with the program are:
1. (80) Tests for Predicting Weather (P.I.105).
2. (1) Test Record (P.I.4).
3. (40) Pupil Questionnaires (P.I.10).
4. (1) Questionnaire for teacher (P.I.9).
5. (1) Teacher's guide, Predicting Weather.

C. The programs are consumable. Pupils may write answers directly in the space provided in the programed book.

D. Prerequisites (adapted from Teacher's Manual, Predicting Weather). Before doing the program, the pupil should:
1. Be able to read at or above 4.5 reading level.
2. Be able to use the following words functionally: crystals, endanger, formations, horizon, thunder.
3. Be motivated to learn how to use cloud appearance to predict weather.

E. Duration - Predicting Weather is a very short term program which will be completed in between 60 minutes to 120 minutes. Pupils should not, of course, attempt to finish the program in one sitting. If, in the judgment of the teacher and principal, a fifth-grade class can handle the program from the viewpoint of readability, this program may be used in the fifth grade. Otherwise, it is to be used in grade six.

II. SUGGESTIONS FOR USE IN NEW YORK CITY

A. Grade Level - The program is designed for 5th and 6th grade pupils who read at 4.5 grade level as tested on standardized achievement tests.

B. Kinds of Use - This program may be used for whole-class instruction, for small group or individual instruction. It is suggested that the program be used for periods not in excess of fifteen totwenty minutes at a time, two or three times a week. Teacher's experience with her pupils will dictate the duration of subsequent exposures. Some bright, highly-motivated pupils, if given free rein, could complete the program in a few days. At any rate, it will be of interest to determine the time spent by each pupil on his program. Each child can be held responsible each day for keeping a record of the hours and minutes on a locally-produced form which can be kept with his own answer sheet, answer booklet or inside the program's front cover. A suggested form is given below:

Pupil's Name _____ Class _____

Date	Frames	Time From	Time To

Total working time for each pupil may then be entered on completion of the program on mimeographed "Test Record" sheet.

C. Teacher's Role - There are six principal aspects to the teacher's role in this program (some others may emerge as a result of this study):

1. Initial Preparation of Records
   a. Initial preparation of "Test Record" sheet. Enter pupils' names, birthdate, I.Q. (if available), reading level.
   b. Preparation of "Pupil Time Record" sheet for pupil use.
2. Teacher Preparation
   a. Reading of A Programed Primer on Programing.
   b. Reading of Teacher's Manual, Predicting Weather.
   c. Reading of the program itself.
   d. Decision-making, with supervisor's assistance, regarding kinds of use, subject to modification in the light of experience.
   e. Separate sliders from blue, perforated sheets. Place one in each program.
3. Pretest - The pretest (P.I.105) is to be given to measure the knowledge which pupils bring to the program before they begin work on the program.
   a. Distribute test papers and instruct pupils to place their name and date across the top of the page. Reduce anxiety by assuring the pupils that you do not expect them to know all or even half of the answers on the test. Tell them that the pretest score will not affect their class marks or report card marks.

b. Administer and score pretest (P.I.105). Allow plenty of time for each child to finish. There is no time limit. Score one point for each correct answer. Highest possible score is 20. Enter pretest scores on "Test Record" sheet (P.I.4).

4. Pupil Preparation
   a. The Mechanics of Program Use - The pupils should be familiar with the use of the slider for concealing answers until after they have written their response. They should be familiar with the use of the time record sheet, the method of responding to the program's questions and with the method of immediate checking of answers. Use "Directions for Using This Program" on inside front cover to help pupils learn the mechanics of program use.
   b. Psychological preparation - Pupils should understand that the program is designed to teach them. They should be reminded that the program is not a test, and that they will not be marked on it. They should be aware that there will be a test later -- after completion of the program -- but that teacher will not mark the program itself. This will help them to understand that there is no advantage to be gained in peeking ahead at answers before they have written their own response. If they make a mistake, they should draw a line through the incorrect answer and write down the correct one next to it. Some pupils do not understand that they are learning when they get so many correct answers; they should learn that the programs were designed for individual use; the Pupil's Time Record Sheet is to help us find out how children learn, and that we have no thoughts of conducting a race. Avoid mentioning thd experimental nature of this project; it can have an undue effect on the outcomes.
5. Administration of the Program - Especially in the initial parts, the
6. teacher should assist the pupils in the mechanics of answering and time-keeping. Questions about the content may be answered by giving hints. It is very important that the pupil remain confident of his ability to solve problems himself, and hints which are too frequent or too broad can make him lose sight of the fact that he is advancing by exercising his own intellectual capacity. As noted above, the program may be used for fifteen to twenty minutes per day two or three times a week. The schedule may be modified by the teacher in the light of the pupils' reactions. Avoid boredom through overexposure.

   Programed material will, in the future, be part of, or will be supplemented by, discussions, "laboratory" experiences, audio-visual aids, etc. For purposes of this study only, teachers will let the program assume the entire burden of instruction in this area, and refrain from developing points made in the program, giving additional practice, etc.

6. Post-testing; Completion of Records - Because pupils advance at their own rate, they will finish the program at different times. As soon as each pupil has completed the program, he should be given the mimeographed posttest (P.I.105). The posttest is the same as the pre-test, and it is to be scored in the same way. Enter posttest scores on the Test Record sheet. Distribute Pupil Questionnaires to pupils and encourage their candid, whole-hearted cooperation in responding. Fill out the Teacher's Judgment Sheets. Your frank answers and comments may well be the most valuable part of the entire study. Place these papers in an envelope and send to the principal for forwarding to Elementary Division -
   1. Test Record Sheet (P.I.4)
   2. Teacher's Judgment Sheets (P.I.9)
   3. Pupil Questionnaire (P.I.10)

   The programs may be retained in the classroom for purposes of review.