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ABSTRACT

A pretest in mathematics determined the starting point for low-income elementary school students in a three year Individually Prescribed Instruction (IPI) project, in which each student progressed through the IPI continuum of skills at his own rate as he proved his mastery of successive skills. The results of the first two years of this project indicate that the children gained mathematics skills as rapidly as average students throughout the county and much more rapidly than students in three comparable low-income schools. Students rated mathematics as one of their favorite subjects, while teachers preferred IPI over more traditional math programs. (Author/RH)

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Minneapolis Public Schools

Second Year Evaluation
IPI Mathematics Project
Hall School
1970-71

A Title I, ESEA Project

Lary Johnson, Research Associate
and
Donald R. Ostrum, Project Coordinator

Ideas expressed in this report do not necessarily reflect the official position of the Minneapolis Public School Administration nor the Minneapolis School Board.

Research Division
Office of Research, Development
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October 1971

Minneapolis Public Schools

Second Year Evaluation
IPI Mathematics Project
1970-1971

Summary

This report covers the second year of a planned three-year trial of the Individually Prescribed Instruction (IPI) project at Hall School. Hall is located in one of the lower income sections of Minneapolis, and the average mathematics and reading scores of its students have been considerably below the average for all Minneapolis schools. Funded by Title I, ESEA, the IPI project served the 300 students in grades 1-6 during the 1970-71 school year.

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The main goal of the IPI project was to improve the students' mathematics achievement. Beginning at a level determined by a pretest, each student progressed through the IPI continuum of skills at his own rate as he proved mastery of successive skills. First year (1969-70) results indicated that the achievement gains of Hall students were equal to gains expected by average students throughout the country and were greater than gains by students in three comparable low income Minneapolis schools.

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The results for the second year (1970-71) showed that Hall students were continuing to make progress. On a standardized mathematics achievement test, students in grades 4, 5, and 6 gained 9, 10, and 7 grade equivalent months, respectively, during an eight-month period from early October to late May. Compared with the publisher's norms, the fourth and fifth graders scored eleven percentile points higher on the posttest than the pretest. If they maintain their current rate of growth, it appears that when the 1970-71 third and fourth graders are in sixth grade, they will have higher mathematics achievement scores than the 1969-70 and 1970-71 sixth graders.

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Reactions to the IPI project by both staff and students continued to be favorable. Students rated mathematics as one of their favorite subjects, while teachers preferred IPI over more traditional math programs.

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* * *

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This evaluation was conducted by the Research Division of the Minneapolis Public Schools with the cooperation of the Hall School staff. The report generally follows the procedures and format described in Preparing Evaluation Reports: A Guide for Authors, U. S. Department of Health, Education and Welfare, OE-10065. Readers who are familiar with the Research Division evaluation reports may wish to skip the first two sections describing the City of Minneapolis and the Minneapolis Public Schools since this description is standard for all evaluation reports.

Lary Johnson conducted the evaluation under the general supervision of Dr. R. W. Faunce, Assistant Director for Research. Donald Ostrum, IPI project coordinator for the second half of the school year, prepared the program description sections of this report. Lary Johnson was responsbile for the evaluation, results, and discussion sections. William Scott, IPI project coordinator for the first semester, and Donald Ostrum were responsible for the field testing. John D. Manville, Principal of Hall School, and other staff members at the school were very cooperative.

The City of Minneapolis

The program described in this report was conducted in the Minneapolis Public Schools. Minneapolis is a city of 434,400 people located on the Mississippi River in the southeastern part of Minnesota. With its somewhat smaller twin city, St. Paul, it is the center of a seven county metropolitan area of over 1,874,000, the largest population center between Chicago and the Pacific Coast. As such it serves as the hub for the entire Upper Midwest region of the country.

The city, and its surrounding area, long has been noted for the high quality of its labor force. The unemployment rate in Minneapolis is lower than in other major cities, possibly due to the variety and density of industry in the city as well as to the high level capability of its work force. The unemployment rate in May of 1971 was 4.7%, compared with a 6.2% national rate for the same month. As the economic center of a prosperous region rich in such natural resources as forests, minerals, water power and productive agricultural land, Minneapolis attracts commerce and workers from throughout the Upper Midwest region. Many residents are drawn from the neighboring states of Iowa, Wisconsin, Nebraska and the Dakotas as well as from the farming areas and the Iron Range region of outstate Minnesota.

More Minneapolitans--three out of 10--work in clerical and sales jobs than in any other occupation, reflecting the city's position as a major wholesale-retail center and a center for banking, finance and insurance. Almost as many (27%) are employed as craftsmen, foremen and operatives, and one out of five members of the work force are professionals, technicians, managers, and officials. Fewer than one out of five (17%) workers are employed in laboring and service occupations.

Minneapolis city government is the council-dominated type. Its mayor, elected for a two year term has limited powers. Its elected city council operates by committee and engages in administrative as well as legislative action.

Minneapolis is not a crowded city. While increasing industrial development has occupied more and more land, the city's population has declined steadily from a peak of 522,000 in 1950. The city limits have not been changed since 1927. Most homes are sturdy, single family dwellings built to withstand severe winters. Row homes are practically non-existant even in low income areas. In 1970, 48% of the housing units in Minneapolis were owner-occupied.

Most Minneapolitans are native born Americans, but about 35,000 (7%) are foreign born. Swedes, Norwegians, Germans, and Canadians comprise most of the foreign born population.

Relatively few non-white citizens live in Minneapolis although their numbers are increasing. In 1960 only three percent of the population was non-white. The 1970 census figures indicate that the non-white population has more than doubled (6.4%) in the intervening 10 years. About 70% of the non-whites are Black. Most of the remaining non-white population are Indian American, mainly Chippewa and Sioux. Only a small number of residents from Spanish-speaking or Oriental origins live in the city. In 1970 non-white residents made up 6.4% of the city's population but accounted for 15% of the children in the city's elementary schools.

Minneapolis has not yet reached the stage of many other large cities in terms of the level of social problems. It has been relatively untouched by racial disorders or by student unrest. Crime rates are below national averages. Continuing concern over law and order, however, is still evidenced

by the election two years ago and the recent re-election of Mayor Charles Stenvig, a former police detective.

One's first impression is that Minneapolis doesn't really have serious problems of blight and decay. But the signs of trouble are evident to one who looks beyond the parks and lakes and tree-lined streets. As with many other large cities, the problems are focused in the core city and are related to increasing concentrations there of the poor, many of them non-whites, and of the elderly. For example, nine out of 10 Black Americans in Minneapolis live in just one-tenth of the city's area. While Minneapolis contains 11.4% of the state's population, it supports 27% of the state's AFDC families. In addition, more than one out of every four school children in Minneapolis now is living in a low income (Title I criteria) home.

There has been a steady migration to the city by Indian Americans from the reservations and by poor whites from the small towns and rural areas of Minnesota. They come to the "promised land" of Minneapolis looking for a job and a better way of life. Some make it; many do not. In 1967 the city supported one out of 10 of the state's Indian Americans who were on relief; in 1969 the city supported three out of 10. The Indian American population is generally confined to the same small geographic areas where the Black Americans live. Estimates of the Indian unemployment rate vary, but range as high as 60%. These same areas of the city have the lowest median incomes in the city and the highest concentrations of dilapidated housing, welfare cases, and juvenile delinquency.

The elderly also are concentrated in the central city. In 1970, 15% of its population was over age 65. The elderly, like the 18 to 24 year old young adults, live near the central city because of the availability of less expensive housing in multiple-unit dwellings. Younger families

have continued to migrate toward the outer edges of the city and surrounding suburban areas.

The Minneapolis Schools

About 78,700 children go to school in Minneapolis. Most of them, about 64,200, attend one of the city's 99 public schools; 14,500 attend parochial or private schools.

The Minneapolis Public Schools, headed by Dr. John B. Davis, Jr., who became Superintendent in 1967, consists of 68 elementary schools (kindergarten-6th grade), 15 junior high schools (grades 7-9), nine high schools (grades 10-12), two junior-senior high schools, and five special schools. Over 3,700 certificated personnel are employed.

Control of the public school system ultimately rests with the seven member School Board. These non-salaried officials are elected by popular vote for staggered six year terms. The Superintendent serves as the Board's executive officer and professional adviser, and is selected by the Board.

The system's annual operating general fund budget in 1971 was $72,784,887 up from $62,385,985 in 1970 and 56,081,514 in 1969. Per pupil costs were $715 in 1970. The range of per pupil costs in the state for 1970 was from $387.00 to $908.00. The range of per pupil expenditure for school districts in the seven-county metropolitan area was $536 to $820 with a mean expenditure of $645.[1] Almost 40 cents of each local property tax dollar goes for school district levies. The School Board is a separate governmental agency which levies its own

[1] Per pupil cost is the adjusted maintenance cost from state and local funds and old federal programs, exclusive of transportation, per pupil unit in average daily attendance for the 1968-69 school year. Source of these figures is Minnesota Education Association Circular 7071-C2 Basic Financial Data of Minnesota Public School Districts, February, 1971.

taxes and sells its own bonds. Minneapolis also received federal funds totaling 4.2 million dollars in 1970-71 from many different federal aid programs. The Elementary and Secondary Education Act provided about 2.9 million dollars of which 2.5 million dollars was from Title I funds.

One of the Superintendent's goals has been to achieve greater communication among the system's schools through decentralization. Consequently two "pyramids" or groups of geographically related schools have been formed. First to be formed, in 1967, was the North Pyramid, consisting of North High School and the elementary and junior high schools which feed into it. In 1969 the South-Central Pyramid was formed around South and Central High Schools. Each pyramid has an area assistant superintendent as well as advisory groups of principals, teachers, and parents. The goals of the pyramid structure are to effect greater communication among schools and between schools and the community, to develop collaborative and cooperative programs, and to share particular facilities and competencies of teachers.

In 1970-71 there were 22 elementary schools, four junior highs, three senior highs, and five parochial schools serving children in areas eligible for programs funded under Title I of the Elementary and Secondary Education Act (ESEA). The federal criteria for selecting these schools are based on economic factors, in particular the number of families receiving AFDC or having incomes under $2,000. About 20,000 children attend these public and parochial schools. Of that number, about one-third of the children have non-white backgrounds, and one-third are defined by the State Department of Education as educationally disadvantaged, i. e. one or more grade levels behind in basic skills such as reading and arithmetic. Federal programs are concentrated on the educationally disadvantaged group.

Based on sight counts on October 20, 1970 the percentage of Black American pupils for the school district was 9.9%. Six years before the proportion was 5.4%. Indian American children currently comprise 3.7% of the school population, more than double the proportion of 6 years ago. The proportion of minority children in the various elementary schools generally reflects the prevailing housing pattern found in each school area. Although some non-white pupils are enrolled in every elementary school, non-white pupils are concentrated in two relatively small areas of the city. Of the 68 elementary schools, 11 have more than 30% non-white enrollment and five of these have over 50%. There are no all-black schools nor all-white schools. Thirty-three elementary schools have non-white enrollments of less than 5%.

The proportion of school age children in AFDC homes has almost doubled from approximately 12% in 1962 to 23% in 1971.

Turnover rate is the percent of students that come in new to the school or leave the school at some time during the school year (using the September enrollment as a base figure). While the median turnover rate for all the city schools in 1969-70 was about 22%, this figure varied widely according to location. Target area schools generally experienced a much higher turnover rate; in fact only two of the target area schools had turnover rates less than the city median. Compared with the city, the median for the target area schools was almost twice as large (41%).

The Project School and Its Neighborhood

The IPI project described in this report took place at Hall Elementary School, one of eight elementary schools in the North Pyramid, and one

of 22 Title I elementary schools. Schools are designated as Title I schools if their district falls above the city median on a combination of poverty and AFDC criteria. Unemployment, delinquency, and amount of unsound housing in the Hall district are well above the city average.

Hall School, built in 1960 at 1601 Aldrich Avenue North, includes kindergarten and grades 1 - 6. The principal is John D. Manville. It is a relatively small school, with 374 students on roll in October 1970 and 355 on roll in June 1971. Between the opening and closing of the 1970-71 school year, 55 students enrolled and 79 students withdrew. Thirty-seven percent of the students have minority backgrounds; 23% Indian American, 12% Black American, and 2% Spanish-surnamed.

Historical Background

The Individually Prescribed Instruction (IPI) math project was introduced at Hall School in the fall of 1969. This report covers the second year of a planned three-year trial at Hall School. IPI is an instructional system based on the premise that each child progresses at his own rate. Development of the IPI system was begun in 1963 by the Learning Research and Development Center at the University of Pittsburgh. Since 1966, Research for Better Schools (RBS), a Regional Educational Laboratory supported by federal funds and located in Philadelphia, has been responsible for the dissemination of the IPI program to interested schools throughout the country.

Staff members of the Research, Development, and Federal Programs Office of the Minneapolis Public Schools visited one of the experimental schools after hearing encouraging reports regarding IPI materials. Subsequently, Title I funds were made available for a trial project in

Minneapolis. Hall Elementary School, a small, target area school with math achievement scores on standardized tests well below the city average was selected as the trial school in Minneapolis.

An evaluation of the first year of the project in 1969-70 indicated that Hall students made gains in mathematics equal to gains made by average students on the publisher's norms. Hall students also made greater gains in mathematics than did students in three comparable Title I schools which did not use the IPI math program. Staff reactions were positive and students gave high rankings to mathematics compared with other subjects.

Project Objectives

The purpose of the IPI math project at Hall School was to increase the basic mathematics skills of educationally disadvantaged children by providing a structured and carefully sequenced system of individualized instruction. As stated in the application for Title I funds, this objective was to be measured by standardized mathematics achievement tests.

The overall goals of the IPI program, as stated by Research for Better Schools, are:

1. To enable each pupil to work at his own rate through the units of study which constitute the learning sequence.
2. To develop in each pupil a demonstrable degree of mastery of the specified math skills.
3. To develop self-initiation and self-direction of learning.
4. To foster the development of problem-solving thought processes.
5. To encourage self-evaluation and foster self-motivation in the learning process.

Participants

All children enrolled in grades 1-6 at Elizabeth Hall Elementary School in Minneapolis during the 1970-71 school year participated in the IPI math project. About 300 students were enrolled in these grades. The 60 first graders were involved in the program only from January until the end of the school year. Participants ranged in age from 5 to 13 years, and there were about equal numbers of boys and girls.

Personnel

For the first year of the IPI project (1969-70), one project coordinator, two floating teachers and six teacher aides were added to the existing school staff. The same additions to the staff were continued for the second year of the project (1970-71). However, at the end of the first semester, the project coordinator, William Scott, was appointed to an administrative position in another school. The intermediate grade floating teacher, Donald Ostrum, assumed the project coordinator's duties in addition to his responsibilities as a floater. Of the six teacher aides, four had previous experience as aides. One aide had a college degree, two were high school graduates, one had completed high school equivalency exams, and two did not complete high school. Twelve regular classroom teachers, two at each grade level, completed the staff for the program. All staff members participated in special training before using IPI materials.

The classroom teacher had a key role in Individually Prescribed Instruction. Each classroom teacher was responsible for evaluating the record for each pupil, diagnosing his needs, and preparing an individual learning prescription. These activities occurred daily. Teachers also

tutored individuals or small groups of children. The most significant change in the teacher's role from that in a regular classrom was that little time was spent in lecturing to the entire class, while the majority of time was spent helping individual students, evaluating their progress, and diagnosing learning needs.

Two floating teachers, one assigned to the primary grades and the other to the intermediate grades, assisted the teachers in reviewing records and writing individual prescriptions. They also devised and supplied supplementary worksheets and materials and directed the use of manipulative devices. Floating teachers also presented seminar sessions on various topics to groups of children in the class and acted as tutors for individual students.

One teacher aide was assigned to each grade level. For the two classes at that level, she corrected all pupil work booklets, skill sheets, and tests, maintained student folders, and assisted in duplicating supplementary instructional materials and keeping manipulative devices in good repair. The project coordinator assumed responsibility for coordinating all phases of the program, as well as making public presentations on the program, planning tours for visitors, and assisting in the evaluation efforts.

Inservice Training

Three new teachers and one aide met one week prior to the beginning of the 1970-71 school year for a five-day training session. Each teacher received a set of six manuals entitled "Teaching in IPI Mathematics" that explained the IPI system in great detail. The aide received a manual entilted "Teacher Aide in IPI Mathematics" which described her role in the IPI system.

The first three days of training were spent reading and discussing the contents of the manuals. During the last two days the group tested students and filled out student placement profile sheets. All new staff members were involved in both theory and practice.

Physical Arrangements

An unused classroom at Hall School was designated as a materials center and office for the IPI program. Special shelving had been purchased previously to accommodate the printed instructional materials, tests, and supplementary worksheets. The project coordinator, the floating teachers, and the teacher aides used this room as an office when they were not in the classroom. The students remained in their same rooms throughout the day, while the two floating teachers and the teacher aides moved from room to room, taking all math materials and equipment with them on rolling carts. Two math classes were in progress each hour of the day.

Planning and Training

Six inservice meetings were held during the school year to answer questions and discuss problems that had arisen. These meetings were scheduled when the project coordinator felt there was a need for a meeting and were held on Tuesday afternoons starting at 2:15 p.m. This time was designated as release time for teacher meetings throughout the city.

An area consultant from Research for Better Schools, Inc., visited Hall several times during the year and gave recommendations for improvement.

Activities and Materials

The IPI math program is organized on a continuum of 416 specific

math skills. These skills are grouped into eight levels, from A-H, according to increasing difficulty (A is easiest; H is hardest). There are thirteen topic areas,which cut across all levels: Numeration, Place Value, Addition, Subtraction, Multiplication, Division, Combination of Processes, Fractions, Money, Time, Systems of Measurement, Geometry, and Special Topics. Each topic area consists of groups of skills in each of the eight levels. The skills in one topic area at one difficulty level comprise a unit. Thus the precise point at which a child is working in the continuum can be identified by naming the level, the topic area, and the specific skill number within that topic area. For example, D-Time-2 identifies the 2nd skill in the Time unit at the D level.

Levels A and B were revised for the 1970-71 school year. The revision increased the number of learning experiences at these levels and, consequently, increased the number of skills to be learned before the child could move on to the next level. Revisions for levels C-G will be available for the 1972-73 school year.

The next few paragraphs describe the IPI system in detail. A sample is given of how one child progressed through the diagnostic system and through one of the units of study. Persons who are already familiar with IPI may wish to turn directly to the next section, Parent Involvement, on page 21.

The first step in administering the program is to assess the child's level of skill acquisition so that he can be placed at the proper point in the continuum. The placement instrument measures mastery for each unit of work (for example, the skills in D-Addition constitute one unit), and provides a gross profile of the student's strengths and weaknesses.

The criterion level for mastery of each unit on the placement test is 80%. Shaded areas on the placement profile indicate areas in which no objectives are specified in the IPI continuum.

In the example shown on page 14, Peggy was first given the placement test covering all units in Level D. She was given the placement test at Level D on the basis of her performance last year. The profile indicates that Peggy scored 80% or better on all but two units: Numeration and Time. This means Peggy should begin her instruction on D-Numeration and then complete D-Time before she goes on to any Level E units. Next, Peggy took the Level E placement tests on the ten units she passed at Level D. She scored 80% or better on two of these units and was advanced to Level F. If Peggy reached Level F of these two units later in the year, she could "pass out" of them by scoring 80% or better on the placement test.

A plan for Peggy's course of study resulted. She would first remove the deficiencies in Level D, starting with the skills in Numeration, followed by Time. Then she would move into Level E and cover, in order, the skills in Numeration, Place Value, Subtraction, Multiplication, Division, Combination of Processes, Fractions, Time, Systems of Measurement, and Geometry.

The Student Profile, shown on page 16, indicates Peggy's progress through the units. An X indicates that she passed that unit on the placement test. A single diagonal line indicates she went through the instructional materials and passed the posttest on the date shown.

While the placement test indicated areas of weaknesses, it did not identify specific skills which Peggy lacked. To do this on the initial placement test would make it much too long and cumbersome. Therefore, a pretest for each unit at each level was given to measure acquisition of the specific skills within that unit, and was assigned prior to any teaching within the unit. For example, before Peggy started in D-Numera-

ipi MATHEMATICS PLACEMENT PROFILE

STUDENT NAME Peggy STUDENT NUMBER

SCHOOL STAMP Hall GRADE 5 ROOM 207

MATHEMATICS AREA	DATE OF TEST		PLACEMENT LEVELS B G							PLACED AT LEVEL
			A	B	C	D	E	F	G	
NUMERATION		MAX PTS				5				D
		SCORE				3				
		%				60				
PLACE VALUE		MAX. PTS.				5	7			E
		SCORE				5	5			
		%				100	71			
NUMERATION / PLACE VALUE		MAX. PTS.								
		SCORE								
		%								
ADDITION		MAX. PTS.				5	5			F
		SCORE				5	5			
		%				100	100			
SUBTRACTION		MAX. PTS.				5	5			E
		SCORE				5	3			
		%				100	60			
ADDITION / SUBTRACTION		MAX. PTS.								
		SCORE								
		%								
MULTIPLICATION		MAX. PTS.				10	5			E
		SCORE				10	1			
		%				100	20			
DIVISION		MAX. PTS.				10	5			E
		SCORE				9	0			
		%				90	0			
COMBINATION OF PROCESSES		MAX. PTS.				5	5			E
		SCORE				5	3			
		%				100	60			
FRACTIONS		MAX. PTS.				5	10			E
		SCORE				4	3			
		%				80	30			
MONEY		MAX. PTS.				5	2			G
		SCORE				5	2			
		%				100	100			
TIME		MAX. PTS.				4	5			D
		SCORE				3	3			
		%				75	60			
SYSTEMS OF MEASUREMENT		MAX. PTS.				4	5			E
		SCORE				4	0			
		%				100	0			
GEOMETRY		MAX. PTS.				4	5			E
		SCORE				4	3			
		%				100	60			
APPLICATIONS, or SPECIAL TOPICS		MAX. PTS.								
		SCORE								
		%								

Based upon prototype originated by the Learning Research and Development Center. As Field tested by Research for Better Schools, Inc.

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tion, she took a pretest covering only the five skills in that unit. The criterion level for mastery of a skill on the pretest is 85%.

An individual prescription or plan of study was written for Peggy by her teacher, assigning her to the Standard Teaching Sequence (STS) booklets covering the skills she had not mastered at the 85% criterion. Each STS booklet covers one skill and contains a number of pages which the child works himself. Each prescription is corrected by an aide as the child completes it, and a record of the number of correct problems is made. Sample pages from an STS Booklet for Time, Level D, Skill 1 are shown in Appendix A (page 36).

Within each booklet there are two curriculum embedded tests (CET). A sample is shown in Appendix A. The CET serves as a short test of a child's progress toward acquistion of the skill. If the child fails a CET (less than 85% correct) he is assigned to supplementary materials, which are described in further detail below.

When the child has completed the instructional materials on all the skills in a particular unit, he takes a posttest to measure his level of mastery of the entire unit. The posttest is an alternate form of the pretest for that unit and the criterion level is 85% correct. He does not move on to a new unit until this level of mastery is achieved.

The child's progress through a unit is recorded on a Mathematics Prescription Sheet, like the one shown on page 17. This sample shows Peggy's route through the Time unit in Level D. In the lower right corner is a record of her scores on each of the ten skills in this unit on the pretest and posttest. On the pretest, Peggy scored 85% or more on all but skills 2 and 4. From this information, her teacher wrote a prescription

ipi MATHEMATICS STUDENT PROFILE

Name Peggy Grade 5 Room 207

MATHEMATICS AREA	A	B	C	D	E	F	G	
NUMERATION	■	■	X	m 9-23	m 11-25			
PLACE VALUE	■	■	X	X	m 12-16			
NUMERATION / PLACE VALUE	X	X	■	■	■	■	■	
ADDITION	■	■	X	X	X			
SUBTRACTION	■	■	X	X	m 1-25			
ADDITION / SUBTRACTION	X	X	■	■	■	■	■	
MULTIPLICATION	■	X	■	X	m 4-27			
DIVISION	■	X	■	X				
COMBINATION OF PROCESSES	■	■	X	X				
FRACTIONS	X	X	X	X				
MONEY	X	X	X	X	X		■	■
TIME	■	X	X	m 10-12				
SYSTEMS OF MEASUREMENT	■	X	X	X				■
GEOMETRY	■	X	X	X				
APPLICATIONS, or SPECIAL TOPICS	■							

Check (X) the box to indicate mastery of unit.

Based upon prototype originated by the Learning Research and Development Center. As Field tested by Research for Better Schools, Inc.

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P2 — 1970

ipi MATHEMATICS PRESCRIPTION SHEET

17

Mastered

Peggy
STUDENT NAME

STUDENT NUMBER

SCHOOL NUMBER

5
GRADE

207
ROOM

D Time
UNIT

UNIT DATES	
UNIT BEGAN	9-24
UNIT ENDED	10-12
DAYS WORKED	7

TASKS								CURRICULUM TEST				
								PART 1		PART 2		DAYS WORKED
DATE PRES.	PRES. INIT.	SKILL NO.	PAGE NO.	TOTAL POINTS	NUMBER CORRECT	INST. TECH CODES	INSTRUCTIONAL NOTES	NO. OF POINTS	%	NO. OF POINTS	%	
9/24	L.W.	Pretest										
9/25	L.W.	2	Read	student page								
			1	3	3	06						
			2	3	3	12						
			3	3	3	05						
			4	2	2							
			5	2	2							
			6	2	2							
			7	CET	I			2	100	2	100	
			8	3	3							
			9	2	2							
			10	2	2							
			11	CET	II			2	100	2	100	
9/28	L.W.	4	Read	student page								
			1	4	4	07						
			2	6	6							
			3	4	4		Finish this page.					
			4	2	2							
			5	2	2							

INSTRUCTIONAL TECHNIQUES	
CODE	SETTING
01	Teacher Tutor
02	Peer Tutor
03	Small Group
04	Large Group
05	Seminar
MATERIALS	
06	Curr. Texts
07	Teacher Made Skillsheets
08	Film Strips
09	Records/Tapes
10	Research
12	Manipulative Devices

PRE AND POST TEST SCORES									
SKILL NUMBER	MAX POINTS PER SKILL	PRE SCORE	%	POST SCORE	%	POST SCORE	%	POST SCORE	%
1	1	1	100	1	100				
2	1	0	0	1	100				
3	2	2	100	2	100				
4	3	2	67	2	100				
5	2	2	100	2	100				
6	3	3	100	3	100				
7	2	2	100	2	100				
8	2	2	100	2	100				
9	2	2	100	2	100				
10	2	2	100	2	100				
DATES		9-24		10-12					

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which indicated that Peggy should work on the STS booklet for skill 2 in D-Time. The prescription sheet is kept in a folder with the child's name on it, and is reviewed daily by the classroom teacher. The sheet records Peggy's score on each page of the booklet, and her scores on the two curriculum embedded tests.

The prepared STS booklets are not sufficient, in themselves, for individualizing instruction. A variety of settings and materials are utilized. These are entered on the prescription sheet according to the code designations listed in the lower left corner. A description of the various settings follows:

Alone:	If a pupil works in materials but does not have any of the following settings, he is said to work by himself.
Teacher Tutor:	The teacher aids the child by explaining, questioning, etc. This does not include reading of directions.
Peer Tutor:	Two students work together, or one pupil helps another with a specific skill.
Small Group Instruction:	A group of two to ten students is brought together for instruction on a particular skill.
Large Group Instruction:	Eleven or more students are brought together for instruction on a particular skill.
Seminar:	A large group receives instruction on a group of related skills from the floating teacher. An example might be a discussion of the use of Time, applying all the skills from a particular level in this area.

The various types of materials which may be included in a prescription are:

Curriculum Tests:	Material from various textbooks and workbooks is correlated with the various topics and levels. This material is reproduced and distributed to children for work.

Teacher Made Skillsheets:	The child completes a skillsheet prepared by the teacher or a staff member. This usually provides drill exercises in a particular skill.
Film Strips:	This includes the use of any film or filmstrip.
Record/Tapes:	This includes the use of any records, tapes or other audio devices that provide instruction in a particular skill.
Research:	The pupil uses books and/or other materials to learn a skill or group of skills. This work may go beyond simple mastery to include the use of the skill in problem solving.
Manipulative Devices:	A child works with a manipulative device that aides the teaching of a particular skill. Some of the devices used were flash cards, clocks, play money, place value charts, fraction boards, dominoes, geoboards, abacus, number lines, rulers, protractors, peg boards, and liquid measure containers.

Pupils receive immediate feedback on their daily work. Their work is corrected immediately and either help is given or a new prescription is written. For Peggy's prescriptions for Skill 2 in D-Time, one sees that in addition to working the STS booklet, she also used manipulative devices, participated in a seminar, and used material from a curriculum text. A level of 100% mastery on the two CET's in the booklet indicated that she was successfully progressing through the material.

After completing the work on skill 2, Peggy started on skill 4, the only other skill she had not acquired in this division unit. Her prescriptions, which continue on page 20, included the STS booklet on this skill, use of a curricular texts, and a teacher made skillsheet. Again, success on the two CET's indicated adequate progress. A poor showing on one of the CET's would have called for a change in her prescription; perhaps a skillsheet with drill exercises or teacher or peer tutoring. The floating teacher assists in reviewing records and writing prescriptions and is available for special help in cases where children are experiencing difficulty.

ipi MATHEMATICS

MATHEMATICS PRESCRIPTION SHEET

Peggy
STUDENT NAME

D Time
UNIT

PAGE 6 OF 4

TASKS								CURRICULUM TEST				DAYS WORKED
								PART 1		PART 2		
DATE PRES.	PRES. INIT.	SKILL NO.	PAGE NO.	TOTAL POINTS	NO. CORRECT	INST. TECH. CODES	INSTRUCTIONAL NOTES	NO. OF POINTS	%	NO. OF POINTS	%	
			6	2	2							
			7	3	3							
			8	3	3							
10/1	LW		9	4	4	06	Good Work					
			10	6	6							
10/5	LW		11	6	6							
			12	2	2							
			13	6	6							
10/8	LW		CET	I		06	after checking do	4	100	4	100	
			15	3	3							
			16	2	2							
			17	3	3							
			18	4	4							
			19	4	4		Good					
			20	6	6							
			CET	II				4/4	100	4/4	100	
10/12		Posttest										

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At the completion of the material on skill 4, Peggy was ready to take the posttest covering all skills in D-Time. Her scores, shown in the lower right hand corner, indicate that she now had reached criterion level (85%) on all the skills in this unit. She had mastered the unit and was ready to move on to the next unit, E-Numeration.

Supplementary materials, particularly the manipulative devices, are a vital addition to the STS booklets. Concrete representations of concepts are very important, especially for primary children. The project coordinator estimates that the children at Hall spent 30-40% of class time on materials and equipment other than the prepared STS booklets. The IPI system encourages the use of such materials to provide relief from paper and pencil work. However, the selection and implementation of supplementary materials is left almost entirely to the individual school. At the beginning of the program, Hall had a very limited number of manipulative devices available. The inventory for the second year was much greater. For the 1971-72 school year, the staff plans to make math kits to correlate with the various areas. These will be used both for building background and improving skills.

Parent Involvement

The IPI system was explained to the parents of Hall School children during an open house in the fall, and again at each parent-teacher conference. Parents also received information on their child's progress in IPI from completed work taken home by the child, and from report cards. The report card indicated progress by an S-N letter designation: S for "satisfactory progress" and N for "needs improvement." A list of IPI skills which the child had mastered during the marking period was used

to supplement the report card.

Budget

The total cost of the IPI program at Hall School for the 1970-71 school year was $70,300. This amount was made available from Title I of the 1965 Elementary and Secondary Education Act. Of the total expenditures, $64,300 was for salaries and training ($45,000 for the salaries of the project coordinator and two floating teachers, and $19,300 for the salaries of six teacher aides). The remaining $6,000 was used for equipment, supplies, and training. The per pupil cost for the IPI program in 1970-71 was $234. The per pupil cost in 1969-70 was estimated to be $265.

For 1969-70 the per pupil cost for printed materials was $12.00, for 1970-71 it was reduced to $9.50, and for 1971-72 it will go up to $10.00. The eventual per pupil cost for printed materials is hard to predict, but efforts are being made to bring it down to $4.00 or less per year.

Evaluation Design

Standardized achievement tests, subject preference ratings, questionnaires for project personnel, and records of student progress in the IPI continuum were used to evaluate the second year of the IPI project at Hall School. The appropriate level of the Modern Mathematics Supplement to the Iowa Tests of Basic Skills was administered to students in grade 4-6 in early October 1970 and again in May 1971. The third grade test was given to Hall third graders in May only.

Subject preference ratings were obtained for students in grades 2-6 in September 1970 and May 1971 by having the students choose and rank their three favorite subjects from a list provided by the evaluator (list of

subjects and instructions in Appendix B). Each teacher and teacher aide was asked to complete a brief questionnaire at the end of the school year regarding the value of the IPI program and recommendations for changes (a copy of each questionnaire is in Appendix C).

Results

This section of the report has five subsections: Student Progress in the IPI Continuum, Achievement Test Data, Subject Preference Ratings, Teacher Reactions and Teacher Aide Reactions.

Student Progress in the IPI Continuum

The objectives or skills of the IPI mathematics program are sequenced according to difficulty into eight levels, A through H. Although it is not cricket to give grade level distinctions to the IPI continuum of individualized skills, as a rough frame of reference, Level A corresponds to first grade material, Level B corresponds to second grade materials, etc.

Table 1 on the next page indicates the percentage of students at each grade level who were working at each level on September 3, 1970 and on May 28, 1971. The placement level represents the lowest level at which each student was working. It appears that the students made progress through the IPI continuum, considering that a criterion level of 85% correct on the unit posttest was required before a student could advance to the next unit within each level. As an example, in September, 7% and 93% of the third graders were working in levels A and B, respectively. In May, 16%, 50%, and 34% of these same third graders were working in levels B, C, and D, respectively.

Table 1

Percentage of Students in Each Grade Working at Various IPI Levels on September 3, 1970 and May 28, 1971

Grade	Date	Level A	Level B	Level C	Level D	Level E	Level F
Grade 2	Sept 1970	35%	65%				
N=40	May 1971	3%	43%	55%			
Grade 3	Sept 1970	7%	93%				
N=44	May 1971		16%	50%	34%		
Grade 4	Sept 1970		53%	41%	6%		
N=34	May 1971			24%	56%	21%	
Grade 5	Sept 1970		14%	66%	20%		
N=50	May 1971				46%	54%	
Grade 6	Sept 1970		9%	26%	65%		
N=34	May 1971				15%	79%	6%

Another indicator of student progress in the IPI continuum was the number of units completed during the school year. The figures in Table 2 on the next page suggest that most children covered at least one grade level of material during the 1970-71 school year. This estimate was based on the fact that each level B through F contains from 9 to 12 units. Level A has only four units. As an example, the fewest number of units completed by a fifth grade student was 5, the most completed was 21, and the median number of units completed was 10. If a student met the passing criterion for any unit on the pretest, he could skip that unit and go on to the next unit that he had not passed.

Table 2

Number of Units Completed at Each Grade Level
Between September 1970 and May 1971

Grade	N	Fewest Completed	Most Completed	Median Completed
2	40	1	10	6
3	44	2	13	8
4	34	4	17	9
5	50	5	21	10
6	34	5	15	10

Achievement Test Data

Pretest and posttest data on the Modern Mathematics Supplement to the Iowa Tests of Basic Skills was available for 32 fourth graders, 46 fifth graders, and 32 sixth graders. Due to student turnover during the school year, this represents 84% of the grade 4-6 student population at the end of the year. Thirty-nine of the 49 third graders on roll at the end of May 1971 were given the third grade level of the Modern Mathematics Supplement as a post-program measure only. Followup testing for third graders who were absent on the test day was not attempted.

Table 3 on page 26 gives the pretest and posttest mean raw scores, corresponding grade equivalents, publisher's percentiles, and gains between pretest and posttest. The average raw score gain between October and May was statistically significant at each grade level. These raw score gains at grades 4, 5, and 6 were equivalent to nine, ten (one year), and seven grade equivalent months, repectively. According to the publisher's percentiles, the percentile corresponding to the May average raw score was higher than the October percentile at all three grades. The May percentile for fourth graders and fifth graders was up eleven points

Table 3

Mean Raw Scores, Grade Equivalents, Publisher Percentiles, and Gains for Hall Students in Grades 3-6 on an October 1970 Pretest and May 1971 Posttest Using the Modern Mathematics Supplement to the Iowa Tests of Basic Skills

	Pretest	Posttest	Gain
Grade 6 (N=32)			
Mean Raw Score	11.8	15.5	3.7
Grade Equivalent	4.8	5.5	.7
Publisher Percentile	18	21	+3
Grade 5 (N=46)			
Mean Raw Score	11.2	16.1	4.9
Grade Equivalent	3.9	4.9	1.0
Publisher Percentile	17	28	+11
Grade 4 (N=32)			
Mean Raw Score	11.9	16.4	4.5
Grade Equivalent	3.4	4.3	.9
Publisher Percentile	25	36	+11
Grade 3 (N=39)			
Mean Raw Score	-	16.0	-
Grade Equivalent	-	3.6	-
Publisher Percentile	-	46	-

over the October percentile, and the May percentile for sixth graders was up three points.

It appears that students in the IPI project at Hall School progressed at a normal rate of growth compared with the average student in the publisher's sample; that is, a one month grade equivalent growth for each month in school. The higher percentile ranking in May 1971 compared with October 1970, particularly in grades four and five, indicates a better than expected growth for students who started at their October level. In other words, students who start below grade level at the beginning of the school year are not expected to make one year's growth on the test during one year of school. However, some of the observed growth was probably caused by a statistical regression toward the mean.

There is some additional evidence that mathematics achievement at Hall School may be improving. Students in lower grades had higher percentile ranks on the Modern Mathematics Supplement than students in upper grades. In May 1971, the average scores for grades three, four, five, and six were at the 46th, 36th, 28th, and 21st percentiles, respectively. It is possible that a new program may be most effective with younger children who neither have had much experience with other math programs, nor have been introduced to enough mathematics materials to fall very far behind. The ranking at the 46th percentile for the average third grade score is encouraging. On the other hand, the higher scores of the younger children in grades three and four may simply reflect the fact that they have not been in school long enough to fall very far behind the publisher's grade level standards. Perhaps, as with many target-area children, they will fall further behind the normative groups as they become older.

However, if the 1971-72 fourth, fifth, and sixth graders make grade equivalent gains similar to the 1970-71 fourth and fifth graders, they will not fall further behind the publisher's norm group. If the same tests are given next year, it will be interesting to see how the 1970-71 third and fourth graders do as 1971-72 fourth and fifth graders.

Since the Modern Math Supplement was used in the 1969-70 evaluation with only the fifth and sixth graders, very few comparisons regarding trends in scores over the first two years of the IPI project can be made. The 1970-71 fifth graders were three grade equivalent months higher than the 1969-70 fifth graders, while the 1970-71 sixth graders were one grade equivalent month lower than the 1969-70 sixth graders on the May administration of the Modern Math Supplement (Table 4). Only after three or more years will it be possible to determine whether or not a definite trend toward higher math achievement scores at each grade level has occurred.

Table 4

A Comparison Between 1969-70 Fifth-Sixth Graders and 1970-71 Fifth-Sixth Graders on the May Administration of the Modern Mathematics Supplement

	Fifth Graders		Sixth Graders	
	May 1970	May 1971	May 1970	May 1971
Mean Raw Score	14.6	16.1	16.4	15.5
Grade Equivalent	4.6	4.9	5.6	5.5
Publisher's Percentile	22	28	24	21

Within each of the upper three grades there was very little difference between classrooms and between sexes on gain scores from pretest to posttest.

Subject Preference Ratings

As in the 1969-70 school year, mathematics was a popular subject with students at Hall School. From a list of nine subject areas (see Appendix B, page 40), students in grades 2-6 were asked to choose and rank their three favorite subjects at the beginning of the school year and again at the end of the school year. To determine the ranking of each subject at each grade level, individual student ratings were scored using the following system. Subjects rated most favorite, second favorite, and third favorite were given scores of three, two, and one, respectively. A total score for each subject was then obtained by summing the individual scores. The subject with the highest total score was ranked number one (most favorite), the subject with the second highest total score was ranked number two, and so forth until the subject with the lowest total score was ranked number nine (least favorite).

The rankings of mathematics by students in the IPI project at Hall School and by students at two other schools that had similar academic, social, and ethnic backgrounds are given in Table 5. Compared with the two other schools, students at Hall rated mathematics as more popular at all grade levels except fifth grade.

Table 5

May 1971 Rankings of Mathematics by Students at Hall Elementary School and Two Other Comparison Schools

	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Hall School	3	3	1	3	1
School A	7	3	4	3	3
School B	8	6	6	3	4

At grades four and six at Hall School, mathematics was rated number one in both September and May. When mathematics was not rated number one by Hall students, it was outranked by gym and/or art.

Teacher Reactions

Nine of the twelve teachers in grades 1-6 completed the teacher questionnaire at the end of the 1970-71 school year. The teachers' reaction to the IPI mathematics program was very positive (Table 6, page 31). Seven of the eight teachers who had experience with math programs other than IPI felt most children learned more with IPI. All eight of these teachers felt most children enjoyed IPI more than other math program. All nine respondents would prefer to continue with the IPI materials, although two teachers would prefer some revisions. Eight of nine teachers felt the program was very worthwhile, and one teacher felt the program was not very worthwhile because the first grade program was not started until late in the year.

The teachers were asked whether particular groups of children would benefit more from an IPI program or from a more traditional math program (Table 7). The consensus was that slow learners, fast learners, average learners, and children with behavior problems would benefit more from IPI. For nonreaders, the opinion was split between IPI and a more traditional program.

Table 7

Teachers' Opinions as to Which Math Program Would Be More Beneficial to Particular Groups of Children

Groups of Children	Number of Teachers Who Said IPI Program	Traditional Program
Slow learners	6	1
Fast learners	8	1
Average learners	8	1
Behavior (discipline) problems	7	1
Nonreaders	4	3

Table 6

Teacher Reactions to the 1970-71 IPI Project

Question	Response	Teacher N	Teacher %
In your opinion, do most children:	Learn more under IPI than in other math programs	7	77%
	Learn about the same under IPI as in other math programs	1	11
	Learn less under IPI than in other math programs	0	0
	I have not taught with other programs	1	11
In your opinion, do most children:	Enjoy IPI more than other math programs	8	88
	Enjoy IPI about the same as other math programs	0	0
	Enjoy IPI less than other math programs	0	0
	I have not taught with other programs	1	11
Would you like to continue using IPI math materials?	Would prefer to use IPI	7	77
	Would prefer other math program	0	0
	No preference; either is O.K.	0	0
	Would prefer IPI with revisions	2	22
All in all, how worthwhile do you feel the IPI math program was this year?	Very worthwhile	8	88
	Fairly worthwhile	0	0
	Not very worthwhile	1	11
	Useless	0	0

All teachers reported that the IPI project was staffed appropriately. No staff changes were suggested.

In response to a request for descriptions of either positive or negative changes in the children's behavior as a result of the IPI project, teachers said that the children looked forward to math, were learning to work independently, and enjoyed math more than before. The teachers' observations support the high rating given to mathematics by Hall students on the subject preference questionnaire.

A complete listing of teacher comments and suggestions is presented in Appendix D. The comments support the continuation of the IPI project. Teachers expressed a need for more inservice sessions, particularly to incorporate more manipulative instructional materials into the program. The teachers also suggested some revisions in the IPI continuum of units that would allow students to spend more time on basic arithmetic skills.

Teacher Aide Reactions

The six teacher aides working in the IPI program indicated satisfaction with the program. Five of six aides said the program was very worthwhile, and one aide said it was fairly worthwhile. All aides felt the program was staffed appropriately. The aides' comments regarding positive or negative changes in the children's behavior emphasized the positive attitudes students have developed as a result of successfully working at their own pace and level. All comments by teacher aides are listed in Appendix D.

Discussion

Achievement data from early October 1970 and May 1971 administrations of the Modern Mathematics Supplement to the Iowa Tests of Basic Skills indicated that Hall students in the IPI project achieved about one month

of grade equivalent growth for each month of school. This rate of achievement is equivalent to the expected growth for the average student in the test publisher's normative sample of students, and is probably greater than the expected achievement of students who started the year below grade level. At the end of the school year, the third graders, who have had most of their math instruction with IPI materials, were at the 46th percentile on the publisher's norms. If they continue to learn at the rate of one grade equivalent year of math each year, they certainly will have better math skills than the fifth and sixth graders of the past few years at Hall School.

Some points should be made regarding any interpretations of the achievement test data. Without a comparison group of students from similar schools that did not use IPI materials, it is difficult to determine the significance of the apparent increased math achievement at Hall School. After the city-wide testing program in the fall of 1971 for the sixth graders and in the winter of 1972 for fourth graders, three consecutive years of scores on the Modern Math Supplement will be available for students in all Minneapolis elementary schools. Comparisons of trends could then be made between Hall and schools with similar student populations.

Another important question that has no answer at this time is: What part of any increased mathematics achievement at Hall School is due to the IPI materials, and what part if any is due to the increased number of staff people working with the children? Perhaps any mathematics program could produce the same or better results if they had a teacher aide and floating teacher in each classroom during the math instruction period.

The use of the Modern Mathematics Supplement to the Iowa Tests of Basic Skills has been questioned as a suitable test for measuring achieve-

ment in the IPI mathematics program as well as other mathematics programs. Last year it was estimated that 15% of the questions in the Modern Math Supplement were not covered in the IPI program, and conversely, many of the IPI skills were not tested by the ITBS Modern Math Supplement. Perhaps the only solution to this problem is for Minneapolis Public Schools to establish their own criteria regarding what mathematics skills should be learned, in what order, and at about what grade level. Items could then be developed or selected from available tests to measure the established criteria.

A most positive aspect of the IPI project was the participants' positive attitudes toward the IPI materials. Teachers and teacher aides strongly endorse the IPI project. Students at all grades selected mathematics as one of their most favorite subjects. Mathematics was not seen in such a favorable light in two comparison schools.

Recommendations

The results of the evaluation, both test data and staff reactions, are the major source for recommendations one through seven. Recommendations eight and nine are the evaluator's and project administrator's.

1. The IPI project continues to look promising and should be continued in 1971-72.

2. Continue to upgrade the use of manipulative devices and cocordinate their use with appropriate unit skills. Hold inservice meetings during the year for teachers and aides to further clarify the use of manipulative devices.

3. Try a more flexible use of the IPI continuum. Horizontal movement from level to level for particular topic areas may be better than vertical movement from topic area to topic area at a particular level.

4. In 1971-72 stress the development of independent, individualized student work. Less teacher direction for some individuals and reduction of group seminars may increase independence and individualization of instruction.

5. Schedule semi-monthly IPI meetings with teachers and aides to encourage discussion of IPI concerns.

6. Continue the inservice training for new teachers and aides. Stress writing of prescriptions, and bring in children as part of the inservice sessions.

7. Consider the possibility of bringing the first graders into the IPI project earlier than the second semester. Perhaps an early emphasis on a basic math vocabulary would be useful.

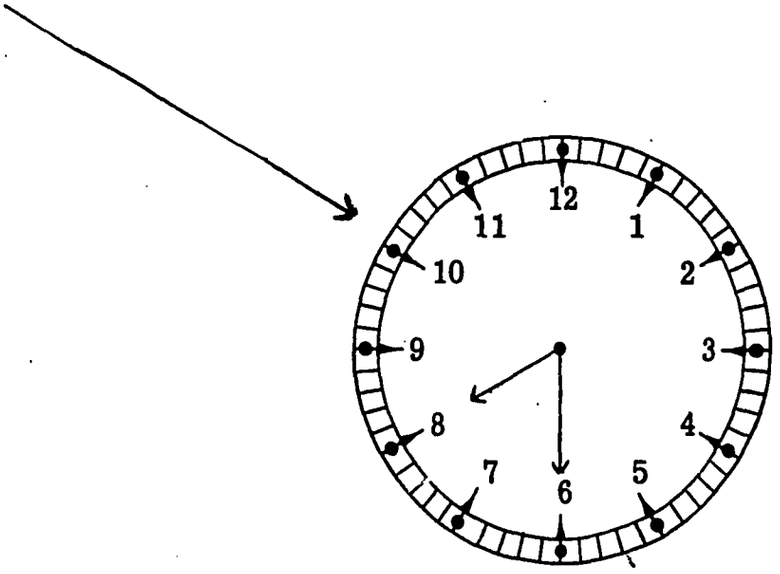
8. Continue using the Modern Mathematics Supplement to the Iowa Tests of Basic Skills in grades 4, 5, and 6 in both the fall and spring, and in grade 3 in the spring. The spring testing should be in the first or second week of May.

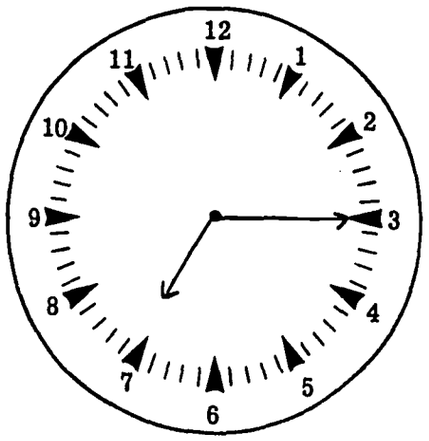
9. Continue using Wednesday as a day for visitors. The project administrator will have this day open and will not float in the intermediate classrooms.

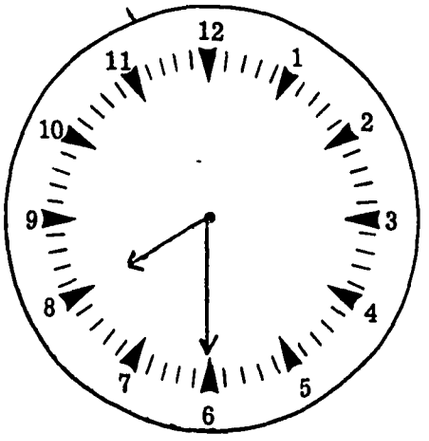
Appendix A

Sample Pages from Standard Teaching Sequence (STS) Booklet for Time, Level D, Skill 1

This clock face shows that it is 30 minutes after 8 o'clock. Draw a line from this clock to the clock at the bottom which shows the same time.







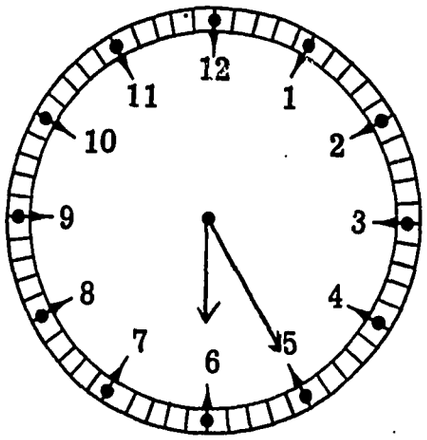
For extra practice, do Page 7.

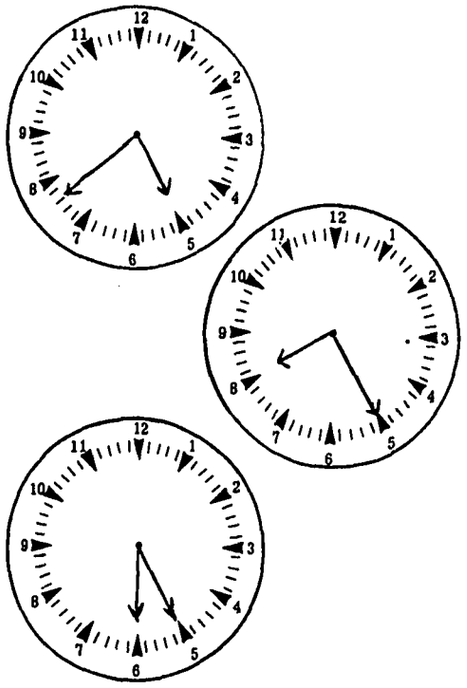
TOTAL POINTS	NUMBER CORRECT
1	

LEVEL	UNIT	SKILL	PAGE
D	10	1	1

This clock shows 25 minutes after 6 o'clock.

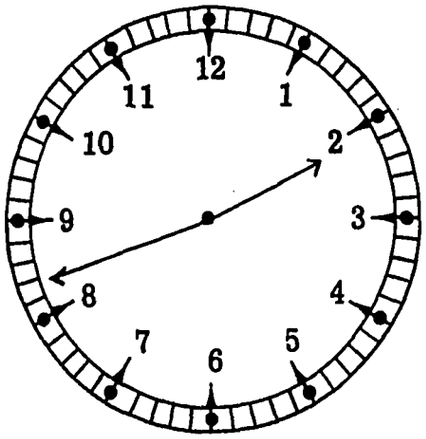
Draw a line to another clock that shows the same time.

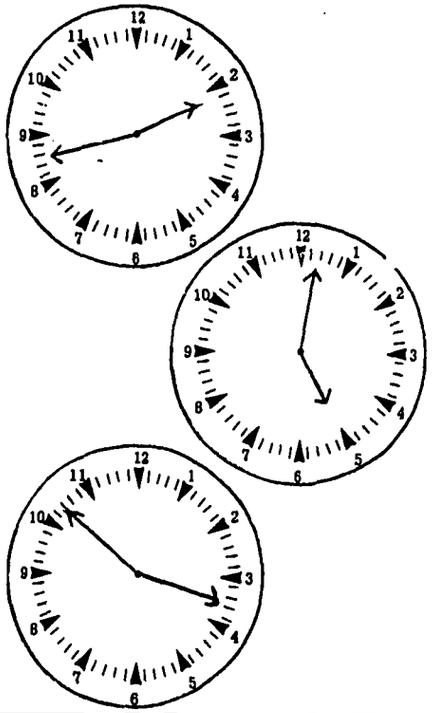




This clock shows 42 minutes after 2 o'clock.

Draw a line to another clock that shows the same time.





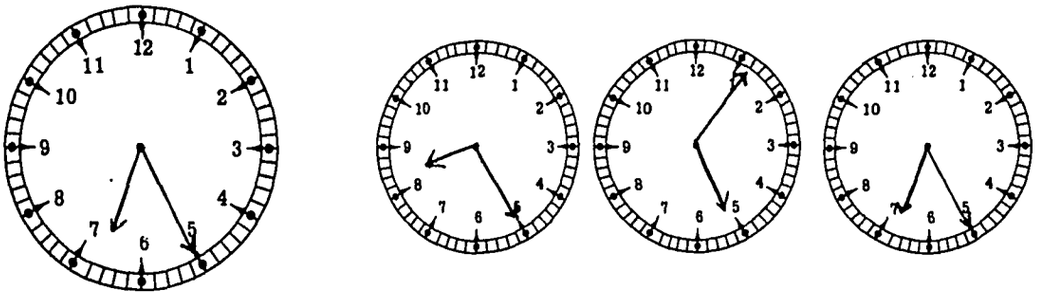
TOTAL POINTS	NUMBER CORRECT
2	

LEVEL	UNIT	SKILL	PAGE
D	10	1	3

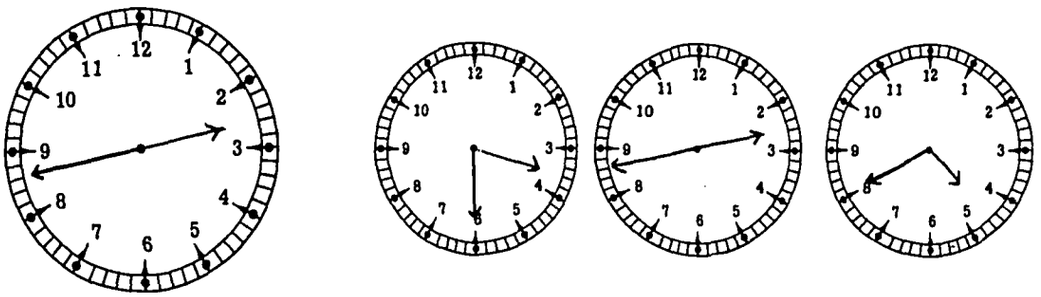
CET I

The large clock face shows 25 minutes after 6 o'clock. Draw an X on any of the small clock faces that shows the same time.

TL. PTS.	
6	100%
NO. OF PTS.	%
5	83
4	67
3	50
2	33
1	17

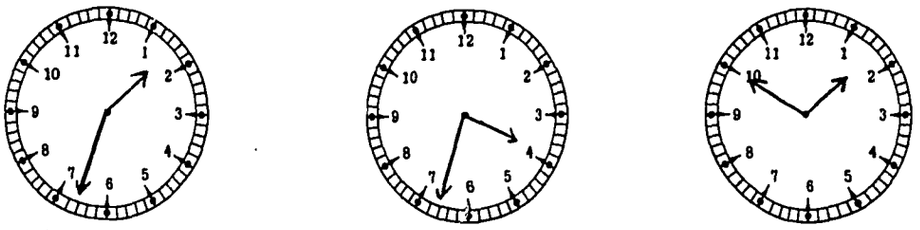


The large clock face shows 43 minutes after 2 o'clock. Draw an X on any of the small clock faces that shows the same time.



Put an X on any clock face below that shows 33 minutes after 1 o'clock and 27 minutes before 2 o'clock.

TL. PTS.	
3	100%
NO. OF PTS.	%
2	67
1	33



LEVEL	UNIT	SKILL	PAGE
D	10	1	6

Appendix B

Instructions to Students for Ranking Their Three Favorite Subjects

Minneapolis Public Schools
Research Division

School_____

Grade _____

May, 1971

PUT NUMBER 1 BESIDE YOUR FAVORITE SUBJECT IN SCHOOL. PUT NUMBER 2 BESIDE YOUR SECOND FAVORITE SUBJECT AND NUMBER 3 BESIDE YOUR THIRD FAVORITE SUBJECT.

_____Art

_____Gym

_____Language

_____Mathematics

_____Music

_____Reading

_____Science

_____Social Studies

_____Spelling

LJ:dm
5/71

Appendix C

Teacher and Teacher Aide Questionnaires

Minneapolis Public Schools
Research Division

IPI Teacher Questionnaire 1970-71

In your opinion, do most children:

_____ learn more under IPI than in other math programs
_____ learn about the same under IPI as in other math programs
_____ learn less under IPI than in other math programs
_____ I have not taught with other math programs

In your opinion, do most children:

_____ enjoy IPI more than other math programs
_____ enjoy IPI about the same as other math programs
_____ enjoy IPI less than other math programs
_____ I have not taught with other math programs

Describe any changes in the childrens' behavior, either positive or negative, as a result of the IPI program _____

_____

_____

_____

_____

For the following groups of children, check the appropriate column if you feel the particular group of children would benefit more from either an IPI program or a more traditional math program.

	Would Benefit More From	
	IPI Program	A More Traditional Program
Slow learners	_____	_____
Fast learners	_____	_____
Average learners	_____	_____
Behavior (discipline) problems	_____	_____
Non-Readers	_____	_____
Other	_____	_____
Other	_____	_____

Do you feel the program was staffed appropriately (teachers, aides, etc)?

_____ staffed appropriately

_____ staffed inappropriately

What changes would you make in staffing? _____

Are there any changes, other than staffing, that would make the IPI program better? Content and organization of IPI materials, time schedules, use of personnel, communication, etc. _____

Is there a need for more in-service training or for changes in the present in-service training? _____

Would you like to continue using IPI math materials?

_____ would prefer to use IPI
_____ would prefer some other math program
_____ no preference; either is o.k.
_____ don't know
_____ would prefer IPI with these revisions _____

_____

_____

All in all, how worthwhile do you feel the IPI math program was this year?

_____ very worthwhile
_____ fairly worthwhile
_____ not very worthwhile
_____ useless

How many years have you taught with IPI materials at Hall?

_____ one year
_____ two years

At what grade level do you teach?

_____ 1-3
_____ 4-6

Comments: _____

_____

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_____

Minneapolis Public Schools
Research Division

IPI Teacher Aide Questionnaire 1970-71

My in-service training for the IPI program was:

_____ very adequate; covered all important aspects of my job

_____ fairly adequate; covered most of the important aspects of my job

_____ not very adequate; covered only a few of the important aspects of my job

What changes would you make in the in-service training for teacher aides?

_____

_____

_____

Do you feel the program was staffed appropriately (teacher, aides, etc.)?

_____ staffed appropriately

_____ staffed inappropriately

What changes would you make in staffing? _____

_____

_____

_____

Are there any changes, other than staffing, that would make the IPI program better? Content and organization of IPI materials, time schedules, use of personnel, communications, etc. _____

_____

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IPI Teacher Aide 1970-71

Describe any changes in the childrens' behavior, either postive or negative, as a result of the IPI program? _____

_____

_____

_____

_____

All in all, how worthwhile do you feel the IPI math program was this year?

____ very worthwhile

____ fairly worthwhile

____ not very worthwhile

____ useless

How many years have you been an IPI teacher aide?

____ one year

____ two years

COMMENTS: _____

_____

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Appendix D

Teacher and Teacher Aide Comments

Teacher Comments

Describe any changes in the childrens' behavior, either positive or negative, as a result of the IPI program.

- The children look forward to working in their booklets.
- Children enjoy Math much more than they have before.
- The capable children are exhilerated by the fact they can progress at their own speed. The children who may be low in reading skills can be very good in arithmetic skills and therefore build up their ego--this in turn helps them in other subjects.
- Children learned to work independently, and take pride in their work.
- Math is looked upon as a fun time and seems to be a personal challenge to each individual.
- The children now look forward to math--it is one of their favorite subjects. They try harder, they learn more because the program has built in success.
- Positive: more eager to learn math.

What changes would you make in staffing?

- I think that we have an almost ideal situation.
- For my small class it was fine. With a larger class I'd want more help.

Are there any changes, other than staffing, that would make the IPI program better? Content and organization of IPI materials, time schedules, use of personnel, communication, etc.

- Children should go to the IPI room as a class--eliminate roaming of halls.
- Communication has been as good as possible. It just takes a little extra effort on the part of those involved. I feel that some of the books need redoing for ex. the posttest for B - Multiplication calls for a skill not taught.
- I found that my time this year--early afternoon better than the last period. I would prefer a yearly overview of what topics we should teach, then break down into quarters, then monthly, and then weekly.

- First grade IPI should be started at the beginning of the year with more time scheduled for each day. More manipulative devices should be used. Children should be grouped and a system for instruction in groups, individual instruction, and a time for independent activity and work should be used. During the independent activity time resource centers in the room should be used.

- It seems an extreme amount of time can be spent on time, fractions, geometry, and measurement by some slow working individuals who are placed on the lower end of the graph by the placement test. Some of these children never get into multiplication or division in an entire year.

- Content for non-readers.

- The program has some flaws but nothing major.

- More communication regarding various devices, math games that are available for classroom use.

Is there a need for more in-service training or for changes in the present in-service training?

- I would like inservice on the availability of manipulative devices and how to use them.

- Yes--but aides should understand what the teacher is trying to do with various children.

- Yes--new teachers should be given time before school starts for training and planning with IPI staff--including aides. During the year more time should be allowed for evaluation and planning with the classroom teacher and the IPI staff--including aides.

- It would be beneficial to have a follow-up training program--now that I'm in it I have many more questions!

- Suggestion:A complete in-service in the fall showing <u>all</u> the various materials available, special aids, etc.

Comments:

- IPI gets the job done with less stress for the children--no one is bored, no one is discouraged. The children get a much needed individual attention.

- Please keep the program.

- I think IPI could be a very successful program for children of all abilities. I would like to see it continued, but only if it is organized so that it's truly individualized and takes into account each child's needs.

- We've really liked the IPI staff. Found them very helpful and friendly. The kids enjoyed them.

- The program teaches math. It gives the children successes much more than failures. The children's attitudes is very positive--many enjoy it more than art or gym. You, as a teacher, are able to find what each individual's problem is and also able in some way to meet these individual needs. I feel I am teaching math and the children are learning math.

Teacher Aide Comments

What changes would you make in the in-service training for teacher aides?

- I feel that working with experienced aides is the best possible training for new aides.

- Manual furnished by RBS is very good--also we learned more by doing.

- I think on the job training is better because you are working with experienced aides. You learn while you are working which is better.

- Forget the majority of the books and just have regular training with the children as the books are too complicated to understand.

Are there any changes, other than staffing, that would make the IPI program better? Content and organization of IPI materials, time schedules, use of personnel, communication, etc.

- Some of the skill books had better get corrected right so there aren't so many mistakes in them.

- C-Time is hard for youngsters to understand, even when they are fairly good at telli_g time-especially Skill 1 on the Pre-test.

- I still think that there should be more planning between teachers and aides, also some of the IPI material goes too slow in multiplication and division. Many children finish 6th grade before getting to long division--not enough stress on multiplication facts. Fractions does not go into subtracting and multiplying soon enough.

- I think everything is just fine as far as I can tell.

Describe any changes in the childrens' behavior, either positive or negative.

- I haven't been in the program long enough to give a good judgment.

- Many of the children are more enthusiastic about math than before, and there is a keen spirit of competition.

- I think the children are more satisfied with math because they are doing only what they are capable of doing.

- In most cases the children have very positive attitudes because they can work at their own pace and speed.

- Most children enjoy and like math and use the period to the utmost. Some children feel they should go thru the program on pretests alone (very small minority) these same children are lazy in other areas. I think the behavior is positive, because most children are happy when we go into the classroom.

Comments:

- Our children may be lower in some areas but I feel that the children are secure in this type of program more than in a conventional math class. Each child has a sense of pride in what he has done.

- I hope this program continues as I think it is a very worth while program.

- More attention should be given to the slower students, so that they don't get "hung up" on a unit, and become discouraged.

- I think IPI is a very good program, because all children are at different levels. The program couldn't operate without aides, because a teacher couldn't work individually with each child, being they are all at different levels and work at their own speed.

Minneapolis Public Schools

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