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ABSTRACT

The elementary INFOE (Information Needed For Occupational Exploration) study for grades 4-6 was conducted to assess the feasibility of establishing an articulated program of career information for students at the elementary school level. Background for the study and the development of the materials is discussed. The major guideline for the INFOE materials was to provide students at the elementary level with basic information on career clusters and general information on specific job titles through a service that reproduced career briefs on microfilm aperture cards introducing a cluster and describing specific job titles. The design and conduct of the study is reviewed. The entire package of 15 INFOE clusters was given to students at each grade level for a given period of time. Teachers completed a 10-item questionnaire, and students were pretested and posttested with a career awareness test. The data and the overall favorable responses for each grade level are presented in tabular form. The findings, conclusions, and recommendations suggest revision on the fourth grade level, division of clusters for each grade level, and additional research regarding alternative materials. A list of schools involved in the study and the career awareness instrument are appended. (JB)

ELEMENTARY INFOE REPORT

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E L E M E N T A R Y

I nformation
N eeded
F or
O ccupational
E xploration

R E P O R T

Prepared by:

Walter A. Cameron

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BACKGROUND FOR THE STUDY

The choice of what a person selects as a career is one of the most important decisions one makes in his or her lifetime. The choice of a career is usually an indication of one's way of life. The choice of a career influences where a person lives, the choice of friends, living style, health and economic life. The knowledge explosion and the continuously changing world of work of our society demands that public education provide students with information and experiences to assist them in making appropriate career decisions.

The value of an occupational information program which exposes students to the world of work at an early age is seldom being questioned today. However, little effort has been exerted to develop and validate an occupational information program for students in grades 4-6. Several states have developed career information programs for providing localized career information to secondary level students and these programs have met with remarkable acceptance. However, the typical situation at the elementary school level reveals a variety of career information materials which represent a bewildering array of materials that have not been evaluated in any systematic manner.

Statement of the Problem

At the present time, there are only a few elementary guidance counselors in the states of Tennessee, Alabama, North Carolina, Georgia and Mississippi. In elementary schools where there are counselors, only a minority of the student body is being served. In addition, there is a serious deficiency of career information available which is geared to the needs of elementary level students. The materials that are available are expensive; therefore, this prohibits most

schools from being able to purchase and use it. An elementary career information program designed to provide current, inexpensive materials on careers is needed to impact on the above problems.

With the preceding situation in mind, the Elementary INFOE study was conducted to assess the feasibility of establishing an articulated program of career information for students at the elementary school level.

Specific Objectives

The specific objectives of Elementary INFOE were to:

1. Develop 300 microfilm aperture cards containing career information on 15 career clusters for use by 4th, 5th and 6th grade students.

2. Pilot test the INFOE materials with elementary students selected from schools located in the following states: Alabama, Georgia, Mississippi, North Carolina, and Tennessee.

3. Provide inservice training and printed guides on the use of the INFOE materials to teachers and students in the pilot schools.

Need for the Study

The research and commentary on career development indicates, beyond any reasonable doubt, that systematic career planning must begin at the elementary school level. Elementary age youth need the opportunity to continuously and systematically explore, from an internal frame of reference, their values, attitudes and interests in relation to the wide array of educational and career opportunities which may be available to them so that they will avoid premature educational and occupational foreclosure. (Gysbers, 1969).

The kindergarten to sixth grade level is the most reasonable place to begin examining the career development process. Children show an interest in the world

of work at a remarkable early age. Even before their explicit interest in the world of work, children are exposed to events which shape aspects of their personal development related to work. (Osipow, 1969).

Herr (1969, 1970) also concurs that intervention in career development must begin during the first decade of life. This is the nursery of human nature and the time when the attitudes are formed which later become manifest in vocational commitment or rejection. Youngsters in elementary schools must be exposed to experiences which are meaningful in terms of their individual characteristics and to information which is accurate if they are not to carry residuals of exaggeration and over-romanticized occupational stereotypes into later decision-processing.

Bottoms and Matheny (1969) indicated that concern for career development cannot be a one-shot approach that takes place at the junior or senior high level. It is too late when the student reaches the point of making the transition from school to work. Career development should be conceived as a pyramid offering a broad base of exploratory experiences at the elementary and junior high levels, gradually narrowing to a decision point as the student acquires appropriate preparation for his next step beyond school. Such a vocational development theme could serve as a common thread to unify the educational effort at all levels.

In addition to the preceding comments, the Elementary INFOE program was viewed as a means for adding a vital component for an articulated K-14 career information program. For the past three years, the Tennessee Research Coordinating Unit has been developing an occupational information system to serve students in grades K-14. The information component for grades 10-14 utilizing

microfilm aperture cards is called Secondary INFOE (Information Needed For Occupational Entry) and has been used in 250 schools throughout the State of Tennessee. A component designed for students in grades K-3 is now being developed. This component called Primary INFOE (Information Needed For Occupational Enlightenment) consists of filmstrips and audio tapes which are designed to introduce students to basic concepts of career development. Another component to be designed for students in grades 7-9 is now in the planning stage. It is called Junior High INFOE (Information Needed For Exploration-Indepth).

DEVELOPMENT OF INFOE MATERIALS

The developmental phase of Elementary INFOE began on October 1, 1972. The major guideline set forth was the INFOE materials were to be designed specifically for providing students at the elementary school level with basic information on career clusters and general information on specific job titles. The key to INFOE was identified as an INFOEscript (a career brief) reproduced on a microfilm aperture card. Plans were made to develop twenty INFOEscripts for each of the fifteen career clusters identified by the U.S. Office of Education. One INFOEscript for each cluster was to consist of a six-page introduction to the cluster. In addition, nineteen four-page scripts for each cluster were to present information on specific job titles.

Since the developmental phase of Elementary INFOE began after the school year had already started, the development of the materials was divided into two phases. The first phase consisted of the development of information on eight career clusters and was completed by the end of February, 1973. The second phase consisted of the development of information and materials for the seven remaining clusters and was completed by the end of June, 1973.

A summary of the major steps completed in developing the INFOE materials is as follows:

1. During October, 1972, two graduate students who together constituted expertise in elementary education, reading instruction and educational psychology began work on developing a format for the INFOEscripts. For the specific job title information a format consisting of the following information was developed:

Page 1 - Description of job title
Page 2 - Traits of persons employed in the job
Page 3 - What a person with job title does
Page 4 - Advantages and disadvantages of the job
What preparation is needed by persons entering the job.

2. The first three months of development consisted of the collection, synthesis and writing of INFOEscripts for the first eight career clusters.

3. The art illustrator, who created the "INFOE Kids" began work on the drawing for the INFOEscripts during November, 1972.

4. Prototype line drawings and working of the INFOE-scripts were critiqued by selected elementary teachers and students during the early stages of development. Several minor modifications were made based on the reactions of the teachers and students.

5. Duplication of materials for the first eight career clusters was completed during the last week of February, 1973.

6. During February, 1973 a teacher's guide was developed which included suggestions on how to use the INFOE materials in a classroom. In addition, a student's guide was developed to assist students in making more effective use of the INFOE materials.

7. Development and duplication of the materials for the remaining seven career clusters were completed by July, 1973.

DESIGN AND CONDUCT OF THE STUDY

The Elementary INFOE study was conducted for the purpose of developing and evaluating career education materials for fifth and sixth grade students. In order to evaluate the materials, the decision was made to present the entire package of 15 INFOE clusters to students at each of the grade levels four, five and six. Students at each grade level were to be exposed to the materials for the first eight career cluster during the period March, 1973 through May, 1973 and to the additional seven clusters during the period September, 1973 through December, 1973. This procedure was modified as the study progressed due to some schools failing to obtain their microfiche readers in time to start in March, 1973.

This section contains information on the design and procedures used in the study. In addition, information on the development of the career awareness test instrument is given.

Population and Sample

Prospective participants in the INFOE study were informed of the study during December, 1972. Mr. Jere Farley, Education Officer from the Tennessee Valley Authority oriented selected school administrators from Alabama, Georgia, Mississippi, North Carolina, and Tennessee to the project. Commitments to participate in the study were received from at least one administrator from each state.

The total population of the study when it began in March, 1973 consisted of the following:

1. Fourth Grade Students - 700 (360 experimental, 340 control)
2. Fifth Grade Students - 800 (403 experimental, 397 control)
3. Sixth Grade Students - 210 (100 experimental, 110 control)

During September, 1973 additional schools who had been unable to obtain microfiche readers for participating in the study in March were added to the population. The added schools were made up of the following:

1. Fourth Grade Students - 355 (180 experimental, 175 control)
2. Fifth Grade Students - 172 (90 experimental, 82 control)
3. Sixth Grade Students - 108 (59 experimental, 49 control)

Due to the situation in which the study was conducted during portions of two school years, the population was categorized by the grade level in which students were enrolled at the end of the study, December, 1973. For example, fourth grade students who participated at the beginning of the study, March, 1973 were labeled as fifth grade students, which they were at the end of the study. Thus, the make-up of the total population was as follows:

1. Fourth Grade Students - 355 (180 experimental, 175 control)
2. Fifth Grade Students - 872 (450 experimental, 422 control)
3. Sixth Grade Students - 1040 (550 experimental, 490 control)

A 30 percent sample of the total population was selected randomly and tested to obtain evaluation data for the study. The specific sample by grade level consisted of:

1. Fourth Grade Students - 122 (67 experimental, 55 control)
2. Fifth Grade Students - 277 (153 experimental, 124 control)
3. Sixth Grade Students - 308 (177 experimental, 131 control)

A list of the schools which participated in the study is presented in Appendix A.

Experimental Design

The experimental design selected for use in this study was a modified version of the Nonequivalent Control Group Design (Campbell and Stanley, 1963). A diagrammatic illustration of the design is as follows:

$$\begin{array}{l} (R_{30})\ O_1 \quad X_{456} \quad O_2 \quad O_3 \\ \text{- - - - - - - - - - - - - - - -} \\ (R_{30})\ O_4 \qquad\qquad O_5 \end{array}$$

R_{30} - Only 30 percent of each population was selected randomly for obtaining evaluative data.

X_{456} - Treatment: Exposure of fourth, fifth and sixth grade students to the INFOE materials

O_1 O_4 - Pretest of student's career awareness

O_2 O_5 - Posttest of student's career awareness

O_3 - Posttest of experimental teacher reactions to the INFOE materials

As shown in the preceding schematic of the design, only 30 percent of both the experimental and control groups (selected from a table of random numbers) were pretested and the same subjects were posttested. In addition to the students being posttested, the experimental teachers were asked to complete a questionnaire designed to solicit their reactions to the use of the INFOE materials.

Development of Career Awareness Instrument

Since there was no available test designed to test the content of the INFOE materials, it was necessary to develop an evaluation instrument to assess student's career awareness. A format utilizing both multiple choice and matching items was selected. After analyzing the content of the INFOE materials, it was decided that to be valid, the evaluation instrument should contain items designed to assess student knowledge of clusters, general descriptions of job titles and tools used by workers in a specific job title.

An instrument consisting of eight cluster definition items, six items of matching job title and illustrations with cluster, ten items matching job titles with job descriptions and twelve items of matching job titles with tools of the trade was developed. To insure equal representation of content from all the INFOE material, cluster titles, job titles and job information was selected at random from the total package of INFOE materials.

The developed instrument was administered to approximately 200 students who have been exposed to other career information materials. Only items which

had an item discrimination index of .45 and a split-half reliability index of .60 were selected for inclusion in the final instrument. After the item discrimination indexes and split-half reliability coefficients were calculated, a total of twenty-four items was selected for the career awareness instrument to be used in the study. A copy of the final instrument is shown in Appendix B.

Procedures

A brief summary of the procedures used in the conduction of the study is as follows:

1. Immediately after development of the INFOE materials for the first eight career clusters, two-hour orientation sessions were held for the teachers who would use the materials in the states of Tennessee, Alabama, North Carolina and Georgia. During the orientation, teachers were oriented to the teacher and student guides.

2. Control and experimental teachers were given copies of the pretest instrument to be administered to students before the INFOE materials were used in the experimental schools. All teachers were instructed how to select a 30 per cent sample of students to be pretested from a table of random numbers.

3. In administering the pretest, all teachers were asked to read each test item aloud to students to minimize the factor of low reading ability on the test results.

4. The INFOE materials for the seven remaining clusters were delivered to schools during September, 1973. In addition, orientation sessions were held to orient new teachers who would be using the materials for the first time. (Schools from Mississippi and additional schools from Alabama were added during September, 1973.)

5. During the Fall of 1973 classroom visits were made to schools in which teachers were experiencing problems in using the materials.

6. During December, 1973 all participating teachers were sent copies of the posttest instrument (same as pretest instrument) to be administered to the same students who had previously been pretested.

Data were analyzed and the results are given in the next section of this report.

EVALUATION RESULTS

To assess the impact of the Elementary INFOE materials, information on the use of the materials was obtained from teachers. In addition, a career awareness test was administered to fourth, fifth and sixth grade students who participated in the study. Students were pretested at the beginning of the study and were posttested at the end. In this section the results of the teacher reactions to the INFOE materials and student career awareness testing will be presented.

Teacher Reactions to Elementary INFOE

Fourth, fifth and sixth grade teachers who used the INFOE materials in their classrooms were asked to complete a 10-item questionnaire about their reactions to the materials. Each of the questions on the questionnaire will be stated and a summary of the answers will be presented.

Item 1: Please specify the grade you teach.
Check below:

a. ☐ 4th b. ☐ 5th c. ☐ 6th

From the thirty-six teachers who used the INFOE materials, instruments were completed by thirty-two. Of the thirty-two, twelve were fourth grade teachers, eleven were fifth grade teachers and nine were sixth grade teachers.

Item 2: How many students under your supervision used the Elementary INFOE materials? _____

The data in Table 1 is presented as a summary of the number of students taught by the thirty-two teachers who completed the questionnaire.

TABLE 1

NUMBER OF STUDENTS BY GRADE LEVEL
WHO USED THE INFOE MATERIALS

Grade Level	Number of Students
4	310
5	496
6	378

Item 3: How would you rate student reaction to the Elementary INFOE materials? (Check one):

a. ☐ Very favorable
b. ☐ Favorable
c. ☐ Unfavorable
d. ☐ Very Unfavorable

A summary of teacher answers to the above question is presented in Table 2 on page 13 . Five of the fourth grade teachers indicated that student reactions to the materials were unfavorable while seven indicated the student reactions were favorable. The fifth and sixth grade teachers indicated their students' reactions were at least favorable.

TABLE 2

TEACHER RATINGS OF STUDENT REACTIONS TO
THE INFOE MATERIALS BY GRADE LEVEL

Ratings	Number of Responses by Grade Level		
	4th	5th	6th
Very favorable	1	2	1
Favorable	6	9	8
Unfavorable	4	0	0
Very Unfavorable	1	0	0

Item 4: What methods did you use in introducing your students to the INFOE materials? Please describe.

Most teachers stated the suggestions in the Primary INFOE Guide were used in introducing the materials to students. In most cases students were introduced to the materials in a large group by use of informal discussion and use of the INFOE interest inventory. Examples of comments which were made by teachers are:

"We discussed the work occupation, discussed various parent's occupations, took the interest inventory, looked over and discussed booklet and learned how to use the microfiche and reader."

"Used an overall introduction to INFOE and what it concerned. Also worked individually with those who could not grasp introduction. We stressed career concepts."

Item 5: What methods or techniques did you find to be most effective in getting students to use the INFOE materials? Please describe.

A variety of techniques were identified by the teachers as being most effective in their particular classroom. Class discussion with the use of individual study was identified as the most effective overall technique. Examples of comments made by teachers are:

> "My children remembered how to use INFOE from the year before. They were briefed; then, they completed the interest inventory. Students used the microfiche reader to explore their interest cluster. We read and discussed many scripts together. The children enjoyed reporting to the class and also dramatizing the occupations."

> "Group work in each cluster. One person from each group reported to the entire class concerning the careers which they had investigated. This eliminated many people reporting on the same career unless they really wanted to."

Item 6: How would you rate student use of INFOE materials as compared to other instructional materials you use in your classroom? (Check one)

a. ☐ Not as good
b. ☐ About the same
c. ☐ Better
d. ☐ Much better

The fifth and sixth grade teachers indicated that student use of the INFOE materials was about the same or better than the use of other instructional materials. Five of the twelve fourth grade teachers indicated student use was not as good as the use of other materials. The fourth grade teachers commented that the reading level was too advanced for many fourth graders. Teacher ratings are presented in Table 3.

TABLE 3

TEACHER RATINGS OF STUDENT USE OF THE MATERIALS AS COMPARED TO USE OF OTHER INSTRUCTIONAL MATERIALS

Ratings	Number of Responses by Grade Level		
	4th	5th	6th
Not as good	5	2	0
About the same	4	7	8
Better	2	2	1
Much Better	1	0	0

Item 7: What are the main limitations of the INFOE materials for classroom use?

The main limitation identified by fourth grade teachers was the reading level of the INFOE materials was to difficult for many fourth grade students. Three of the fifth grade teachers indicated some of the materials was difficult for some fifth grade students. However, the main limitation identified by fifth and sixth grade teachers was the lack of a sufficient number of microfiche readers for their students to use effectively.

Examples of comments made by fourth grade teachers with respect to limitations of the INFOE materials are:

> "The card filing with 4th graders is a constant problem. The vocabulary was too difficult."
>
> "I thought the program was excellent. More microfiche readers would be nice so that more children can work at one time."

Examples of statements made by fifth and sixth grade teachers with respect to limitations of the INFOE materials are:

"We needed more classroom space to work in groups. It is also time consuming, but blends well into our regular classroom work."

"Since only one student at a time can use the materials, it takes too long to get around to each student."

"More microfiche readers could be used."

Item 8: What improvements need to be made in the INFOE materials to make them more useful for your students?

A variety of responses were given with respect to what improvements need to be made in the INFOE materials to make them more useful for students. Two main improvements suggested were: (1) provide means for projecting the materials for use by more than one child at a time, and (2) simplify the vocabulary for fourth graders.

Examples of suggestions made by teachers are:

"Some way to project materials for larger groups. Need simpler vocabulary written on grade level."

"Very good as they are."

"More readers would be nice. Vocabulary was slightly difficult for 4th graders."

"The guides need to be in more detail. Of course it is not the job of the guide to contain each individual career."

Item 9: Would you recommend the INFOE materials to any other teachers?

a. ☐ yes b. ☐ no (check one)

Why or why not.

Twenty-five of the 31 teachers who responded to this question indicated they would recommend the INFOE materials to other teachers. Four fourth grade teachers and three fifth grade teachers indicated they would not recommend the INFOE materials to other teachers. A summary of the teachers' responses is presented in Table 4.

TABLE 4

NUMBER OF TEACHERS AT EACH GRADE WHO WOULD RECOMMEND INFOE TO OTHER TEACHERS

Grade Level Taught	Teacher Response Would Recommend	
	YES	NO
Fourth	7	4
Fifth	8	3
Sixth	9	0

Examples of responses for why teachers would recommend the INFOE materials to other teachers are:

> "These materials give students a different insight into careers."
>
> "I know it makes sixth graders more conscious of possible careers -- they begin thinking about 'What do I want to become?'."
>
> "Students need to become aware of various career opportunities at an early age. This is one of very few programs designed for this purpose."

Examples of comments made by the seven teachers who stated they would not recommend the INFOE materials to other teachers are:

> "I feel children cannot relate to this type of material."
>
> "I feel that the results I have gotten has been poor--probably due to limited time."
>
> "I feel the children don't benefit enough from the program to warrant the time spent when so much more could be accomplished."

Item 10: Which career cluster of INFOE cards did your students appear to like better? (Check all that are applicable).

a. ___ Agri-Business & Natural Resources

b. ___ Business and Office

c. ___ Communications & Media

d. ___ Construction

e. ___ Consumer & Homemaking

f. ___ Environment

g. ___ Fine Arts & Humanities

h. ___ Health

i. ___ Hospitality & Recreation

j. ___ Manufacturing

k. ___ Marine Science

l. ___ Marketing & Distribution

m. ___ Personal Services

n. ___ Public Services

o. ___ Transportation

The selection of career clusters which were liked better by each individual grade level of students is presented in Table 5. The selections by each grade level were varied.

TABLE 5

FREQUENCY BY WHICH FOURTH, FIFTH AND SIXTH GRADE TEACHERS SELECTED EACH CAREER CLUSTER BASED ON FAVORABLE STUDENT RESPONSE

Career Cluster	Teacher Response By Grade Level		
	4th	5th	6th
Agri-Business & Natural Resources	3	5	1
Business & Office	3	4	5
Communications & Media	2	1	4
Construction	5	5	2
Consumer & Homemaking	4	1	2
Environment	5	2	2
Fine Arts & Humanities	4	2	2
Health	7	6	2
Hospitality & Recreation	5	7	6
Manufacturing	1		2
Marine Science	1	2	2
Marketing & Distribution			1
Personal Services	1	2	2
Public Services		1	5
Transportation	3	3	3

Student Career Awareness

To assess the impact of the INFOE materials on students, a career awareness instrument was administered to randomly selected students at the experimental and control schools before the materials were introduced and again at the end of the study in December, 1973. The career awareness instrument consisted of 24 items designed to identify the level of awareness of students with the world of work. Each correct item completed on the instrument was assigned a value of one; thus, 24 points was the maximum score any student could receive. The pretest scores made on the instrument were subtracted from the posttest scores to

arrive at the gain scores of students. A one-way analysis of covariance was used to compute the differences between control and experimental student gain scores. The pretest scores were used as covariates to correct for initial differences in the level of career awareness between control and experimental students at the beginning of the study.

In this section an analysis of the differences in gain scores made on a career awareness test between experimental and control students will be presented by grade level.

Fourth Grade

An analysis of covariance was computed between the gain scores of fourth grade students who used the INFOE materials during September, 1973 through December, 1973 and students in the control schools who did not. Sixty-seven experimental students and fifty-five control students who represented a one-third randomly selected sample of fourth grade students were pretested during September, 1973 and posttested during December, 1973. The analysis of covariance between the gain scores of experimental and control students revealed an F ratio of 5.60 with 1 and 119 degrees of freedom. This F ratio was significant at the .05 level of significance. Table 6 presents the results of the analysis of covariance for the fourth grade level.

TABLE 6

ANALYSIS OF COVARIANCE FOR CAREER AWARENESS DIFFERENCES AMONG FOURTH GRADE STUDENTS AT CONTROL AND EXPERIMENTAL SCHOOLS

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F
Treatments	1	28.48	28.48	5.60*
Within Groups	119	605.80	5.09	
Total	120	634.28		

P.05 ≥3.91 (1 and 119 degrees of freedom)
*Significant at the .05 level of significance

The adjusted means for gain scores from pretest to posttest for fourth grade students revealed that the experimental students experienced a greater gain in career awareness than the control students. The experimental students had an average gain of 3.24 points when the scores were adjusted for initial differences while the control students had an average gain of 2.26 points. The unadjusted and adjusted gain score means and pretest means for experimental and control students are presented in Table 7.

TABLE 7

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF FOURTH GRADE STUDENTS

Group	Number of Students	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Experimental	67	3.36	3.24	12.02
Control	55	2.11	2.26	13.20

Additional information which reveals the differences in gain scores between experimental and control schools for the four states in which fourth grade students participated in the INFOE program is given in Table 8. In Alabama, Mississippi and North Carolina, fourth grade students who used the INFOE materials obtained greater gains in career awareness than students who were not exposed to the materials. The experimental students from Tennessee did not show as great a gain as the control students.

TABLE 8

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF FOURTH GRADE STUDENTS BY SCHOOL

School	Number of Students Tested	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Alabama				
Cherokee (Experimental)	9	2.56	2.60	14.00
Woodville (Control)	10	1.80	1.76	13.70
Mississippi				
Tishomingo (Experimental)	18	6.56	6.21	11.67
Burnsville (Control)	15	2.27	2.68	14.40
North Carolina				
Ranger (Experimental)	9	3.89	3.77	9.67
Hiwassee Dam (Experimental)	10	2.80	2.85	11.00
Hayesville (Control)	15	2.00	1.97	10.47
Tennessee				
Robert E. Lee (Experimental)	21	1.00	.92	12.95
Bel-Aire (Control)	15	2.27	2.37	14.40

Fifth Grade

An analysis of covariance was computed between the gain scores of fifth grade students who used the INFOE materials during the period March, 1973 through December, 1973 and the gain scores of control students who had not used the materials. One-hundred fifty-three experimental students and one-hundred twenty-four control students (a one-third randomly selected sample of fifth graders) were pretested during March, 1973 as fourth graders and were posttested during December, 1973 as fifth graders. The analysis of covariance between the gain scores of experimental and control students revealed an F ratio of 14.96 with 1 and 274 degrees of freedom. This F ratio was significant at the .01 level of significance. Table 9 presents the results of the analysis of covariance for the fifth grade level.

TABLE 9

ANALYSIS OF COVARIANCE FOR CAREER AWARENESS DIFFERENCES AMONG FIFTH GRADE STUDENTS AT CONTROL AND EXPERIMENTAL SCHOOLS

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F
Treatments	1	17.36	77.36	14.96**
Within Groups	274	1416.48	5.17	
Total	275	1493.84		

P.05 ≥3.88 (1 and 274 degrees of freedom)
P.01 ≥6.73 (1 and 274 degrees of freedom)

**Significant at .01 level of significance

The adjusted means for gain scores between pretest and posttest for fifth grade students revealed the experimental students experienced a greater gain in career awareness than the control students. The experimental students had an average gain of 3.18 points when the scores were adjusted for initial (pretest) differences, while the control students had an average gain of 2.11 points. The unadjusted and adjusted gain score means and pretest means for experimental and control students are presented in Table 10.

TABLE 10

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF FIFTH GRADE STUDENTS

Group	Number of Students Tested	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Experimental	153	3.27	3.18	13.20
Control	124	1.99	2.11	13.86

Additional information which reveals the differences in gain scores between experimental and control schools for the five states in which fifth grade students participated in the INFOE program is given in Table 11. An analysis of the adjusted gain score means between the experimental and control schools revealed the students who used the INFOE materials obtained greater gains in career awareness than students who were not exposed to the materials, except for the students in Tennessee. There were small differences between average gain scores of experimental and control students in Tennessee; however, the experimental students did not gain as much as the control students.

TABLE 11

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF FIFTH GRADE STUDENTS BY SCHOOL

School	Number of Students Tested	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Alabama				
Annapolis (Experimental)	30	3.30	3.20	12.37
Blake (Control)	24	2.38	2.49	13.38
Georgia				
Gillen (Experimental)	7	1.28	1.05	13.00
Fairyland (Control)	13	.69	.89	15.15
Mississippi				
Burnsville (Experimental)	24	6.12	6.06	13.50
Belmont (Control)	26	2.15	2.21	13.77
North Carolina				
Murphy (Experimental)	26	2.31	2.40	14.31
Martin's Creek (Control)	17	1.71	1.57	13.29
Ranger (Experimental)	9	4.67	3.96	10.00
Peachtree (Control)	8	1.38	2.17	14.00
Andrews (Experimental)	23	2.91	2.97	13.70
Martin's Creek (Control)	17	1.71	1.63	13.29
Hiwassee Dam (Experimental)	10	2.80	2.67	11.60
Hayesville (Control)	9	2.00	2.14	12.67
Tennessee				
Lee, Tullahoma (Experimental)	12	2.75	2.60	13.50
Bel-Aire (Control)	18	2.77	2.88	14.00
Lee, Fayetteville (Experimental)	21	1.33	1.26	14.83
Highland Rim (Control)	20	1.88	1.98	15.44

Sixth Grade

An analysis of covariance was computed between the gain scores of sixth grade students who used the INFOE materials during the period March, 1973 through December, 1973 and the gain scores of control students who had not used the materials. A one-third randomly selected sample of the sixth grade students was pretested during March, 1973 (at this time the students were fifth graders) and was posttested during December, 1973. The analysis of covariance between the gain scores of experimental and control students revealed an F ratio of 8.07 with 1 and 305 degrees of freedom. This F ratio was significant at the .01 level of significance. The results of the analysis of covariance for the sixth grade level is presented in Table 12.

TABLE 12

ANALYSIS OF COVARIANCE FOR CAREER AWARENESS DIFFERENCES AMONG SIXTH GRADE STUDENTS AT CONTROL AND EXPERIMENTAL SCHOOLS

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Squares	F
Treatments	1	32.11	32.11	8.07**
Within Groups	305	1213.21	3.98	
Total	306	1245.32		

P.05 $\geq$3.88 (1 and 305 degrees of freedom)
P.01 $\geq$6.72 (1 and 305 degrees of freedom)

**Significant at .01 level of significance

The adjusted means for gain scores between pretest and posttest for sixth grade students revealed the experimental students experienced a greater gain in career awareness than the control students. The experimental students had an average gain of 2.43 points when the scores were adjusted for initial (pretest) differences, while the control students had an average gain of 1.77 points. The unadjusted and adjusted gain score means and pretest means for experimental and control students are presented in Table 13.

TABLE 13

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF SIXTH GRADE STUDENTS

Group	Number of Students Tested	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Experimental	177	2.60	2.43	15.69
Control	131	1.53	1.77	16.94

Additional information on the differences in gain scores between experimental and control schools for the five states in which sixth grade students participated in the INFOE program can be obtained from the data presented in Table 14 on page 27 . An analysis of the adjusted gain score means between the experimental and control schools revealed the students who used the INFOE materials obtained greater gains in career awareness than students who were not exposed to the materials, except for the students in Georgia. There was little difference between the average gain scores of experimental and control students in Georgia; however, the experimental students did not gain as much as the control students.

TABLE 14

GAIN AND PRETEST MEANS FOR CAREER AWARENESS SCORES OF SIXTH GRADE STUDENTS BY SCHOOL

School	Number of Students Tested	Gain Score Means		Pretest Means
		Unadjusted	Adjusted	
Alabama				
Woodville (Experimental)	8	1.75	1.44	15.50
W. Limestone (Control)	10	.90	1.15	17.40
Georgia				
Gillen (Experimental)	13	1.15	1.02	15.77
Fairyland (Control)	14	1.79	1.90	17.07
Mississippi				
Belmont (Experimental)	25	2.64	2.88	17.52
Tishomingo (Control)	15	1.07	.67	16.20
North Carolina				
Murphy (Experimental)	25	2.32	2.21	14.96
Martin's Creek (Control)	18	2.00	2.15	15.67
Ranger (Experimental)	10	4.80	4.54	14.60
Peachtree (Control)	8	2.62	2.95	15.62
Andrews (Experimental)	27	3.41	3.29	14.44
Martin's Creek (Control)	18	2.00	2.18	15.67
Hiwassee Dam (Experimental)	9	1.89	1.97	14.33
Hayesville (Control	10	1.50	1.42	15.70
Tennessee				
Lee, Tullahoma, (Experimental)	39	2.80	2.49	15.80
Davidson Academy & Bel-Aire (Control)	36	1.56	2.00	17.94
Lee, Fayetteville (Experimental)	21	1.81	1.72	16.90
Highland Rim (Control)	20	1.15	1.25	17.67

Observations of the Project Staff

A summary of observations made by the project staff based on their visits to the pilot schools is as follows:

1. Teachers who had not attended the orientation sessions on the use of the INFOE materials experienced greater difficulty in using the materials in their classrooms.

2. Student use of the materials was greater in schools where students had easy access to the microfiche reader.

3. Teachers were concerned about too little time being available to expose students to all 15 career clusters included in the INFOEpacket.

4. The dial-a-career kit was found to be of little use for the average student.

5. The interest inventories used to assist students in selecting career clusters to study proved to be very useful.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this section a summary of the major findings and the conclusions based on these findings are given. In addition, recommendations with respect to the Elementary INFOE materials are presented.

Findings

From the analyses of the evaluative data, the following major findings were derived:

1. Seven of the eleven fourth grade teachers who used the INFOE materials reported student reactions to the materials were favorable or very favorable.

2. All of the fifth and sixth grade teachers who completed the teacher questionnaire stated student reactions to the materials were favorable or very favorable.

3. The majority of all teachers who used the INFOE materials reported that group discussion in conjunction with individual study was the most effective technique in using the materials in a classroom setting.

4. The majority of fourth grade teachers rated student use of the INFOE materials versus other instructional materials as "not as good" or "about the same." The fourth grade teachers commented the reading level was too advanced for many of their fourth grade students.

5. The fifth and sixth grade teachers indicated student use of the INFOE materials was "about the same" as student use of other instructional materials.

6. Too high a reading level for many fourth graders was identified by fourth grade teachers as the main limitation of the INFOE materials.

7. The main limitation of the INFOE materials as identified by fifth and sixth grade teachers was the materials were limited mainly to individual study.

8. The two main suggestions given for improving the INFOE materials were: (1) provide ways of using the materials for more than one child at a time and (2) simplify the vocabulary for fourth graders.

9. The majority of all teachers who used the INFOE materials stated they would recommend the use of the INFOE materials to other teachers.

10. No one career cluster appealed more to students than another cluster for a given grade level of students.

11. As a group, fourth, fifth and sixth grade students increased their career awareness significantly by use of the INFOE materials.

12. Teachers stated fifteen clusters of materials consisted of too much information to be presented to students at any one grade level.

Conclusions

The major conclusions drawn from the findings of the study were:

1. Overall teacher reactions to the INFOE materials were favorable.

2. Informal group discussion coordinated with individual study was the most effective technique for using the INFOE materials.

3. Student use of the INFOE materials was as effective as student use of other instructional materials designed for a specific grade level.

4. The reading level of the Elementary INFOE materials was too advanced for many fourth grade students.

5. Minor improvements were identified as being needed to make the Elementary INFOE materials more effective.

6. No one career cluster interested students at any grade level more than another career cluster.

7. The Elementary INFOE materials assisted fourth, fifth and sixth grade students to increase their awareness of the world of work.

8. Fifteen career clusters of materials consisted of more materials than could be adequately used during a school year at any one grade level.

Recommendations

The major recommendations that can be made based on the conclusions of this study are:

1. The Teacher's Guide to Elementary INFOE should be revised to include suggestions teachers gave for making the use of the materials more effective.

2. The following improvements should be made in the INFOE materials:

   a. The introductions to career clusters should be made available on overhead transparencies so more effective group instruction could be used in introducing students to the materials.

   b. The INFOE materials should be divided into selected clusters for each grade level, e.g. five clusters for grade four, five clusters for grade five and five clusters for grade six plus the previous ten clusters for review.

   c. The materials identified for fourth grade students should be revised to reflect a lower reading level. Third grade reading level should be more effective for the average fourth grade student.

3. The revised INFOE materials should be made available for dissemination to fourth, fifth and sixth grade teachers who wish to introduce their students to information on the world of work.

4. Additional research should be conducted to compare the effectiveness of the microform medium of presenting the INFOE materials with other media such as hard copy and color filmstrips.

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APPENDIX A

SCHOOLS INVOLVED IN THE
ELEMENTARY INFOE STUDY

Experimental Schools	Control Schools
Alabama	
Annapolis Avenue School Sheffield, Ala. (4th through 5th)	Blake Elementary School Sheffield, Ala.
Cherokee School (Sept., 1973) Guntersville, Ala. (4th	Woodville School Woodville, Ala.
West Limestone Elementary School (Sept., 1973) Lester, Ala. (4th & 5th)	Cherokee School Guntersville, Ala.
Woodville School (Sept., 1973) Woodville, Ala. (6th)	West Limestone Elementary School Lester, Ala.
Georgia	
Gillen School Lookout Mountain (4th & 5th)	Fairyland School Lookout Mountain
Mississippi	
Belmont Elementary School (Sept., 1973) Belmont, Miss. (6th)	Tishomingo Elementary School Tishomingo, Miss.
Burnsville Elementary School (Sept., 1973) Iuka, Miss. (5th)	Belmont Elementary School Belmont, Miss.
Tishomingo Elementary School (Sept., 1973) Tishomingo, Miss. (4th)	Burnsville Elementary School Iuka, Miss.
North Carolina (Cherokee County)	
Andrews Elementary School (5th & 6th)	Martins Creek
Hiwassee Dam Union School (4th, 5th & 6th)	Hayesville School

Murphy Elementary School
(5th & 6th)

Ranger Elementary School
(4th, 5th & 6th)

Peachtree Elementary School

Tennessee

Robert E. Lee Elementary School
Fayetteville, TN (4th, 5th & 6th)

Lee Elementary School
Tullahoma, TN (4th, 5th & 6th)

East Lincoln Elementary School
Tullahoma, TN (5th & 6th)

Highland Rim School
Fayetteville, TN

Bel-Aire Elementary

Davidson Academy

South Jackson School

APPENDIX B

CAREER AWARENESS INSTRUMENT

CAREER AWARENESS FORM

NAME _____ SCHOOL _____ GRADE _____

TEACHER _____ DATE _____

MATCH THE CAREER CLUSTER ON THE LEFT WITH ITS DEFINITION ON THE RIGHT. PUT THE LETTER BESIDE THE DEFINITION ON THE LINE TO THE LEFT OF THE NAME OF THE CLUSTER.

CAREER CLUSTERS	DEFINITIONS
____1. HEALTH	A. INCLUDES CAREERS WHICH HELP CONTROL AIR POLLUTION, WATER AND LAND USE.
____2. ENVIRONMENT	B. INCLUDES CAREERS CONCERNED WITH SELLING AND TRANSPORTING GOODS AND SUPPLIES.
____3. MARKETING-DISTRIBUTION	C. INCLUDES CAREERS IN WHICH SICK PEOPLE ARE TREATED.
____4. MARINE SCIENCE	D. INCLUDES CAREERS WHICH PROVIDE FOR TRANSPORTING PEOPLE AND GOODS.
	E. INCLUDES CAREERS WHICH PROVIDES FOR THE PRODUCTION AND PROCESSING OF FOOD.
	F. INCLUDES CAREERS CONCERNED WITH CARE OF FISH AND WATER PLANT LIFE.

FOR THE FOLLOWING ITEMS MATCH THE JOB TITLE WITH THE STATEMENT THAT BEST TELLS WHAT THE PERSON DOES WHEN DOING HIS JOB. PUT THE LETTER BESIDE THE DEFINITION ON THE LINE TO THE LEFT OF THE JOB TITLE.

GROUP I

____1. CHEMICAL ANALYST	A. WORKS FOR A CHEMICAL ENGINEER TO TEST THE PURITY OF MATERIALS.
____2. CHEMICAL ENGINEER	B. MAKES BRACES, CROWNS AND BRIDGES TO CORRECT TEETH.
____3. MEDICAL ASSISTANT	C. CONDUCTS LABORATORY TESTS FOR A CHEMIST.
____4. DENTAL LAB TECHNICIAN	D. WORKS FOR A MEDICAL DOCTOR TO KEEP HIS OFFICE RUNNING SMOOTHLY.
	E. APPLIES ENGINEERING SKILLS TO CARRY OUT CHEMICAL PROCESSES.
	F. HELPS THE DENTIST CHECK AND TREAT PEOPLE'S TEETH.

GROUP II

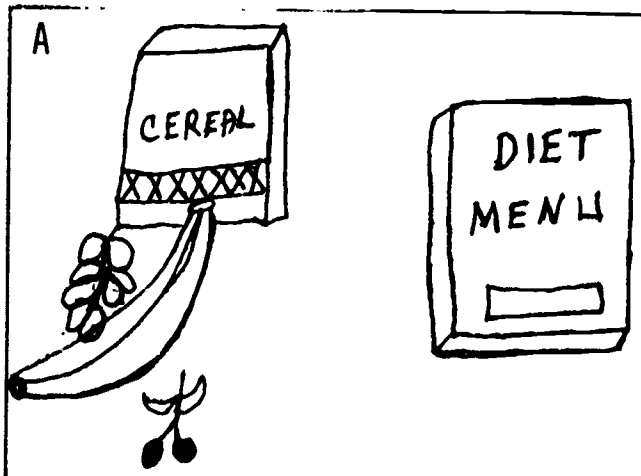
____1. CAMP COUNSELOR	A. HELPS STUDENTS PLAN EDUCATIONAL GOALS.
____2. PROFESSIONAL ATHLETE	B. PLAYS A TEAM OR INDIVIDUAL SPORT FOR PAY.
____3. CREDIT ANALYST	C. WRITES SHIPPING BILLS FOR TRANSPORTING GOODS AND EQUIPMENT.
____4. STOCK CLERK	D. UNPACKS AND STORES SUPPLIES IN A STORE OR WAREHOUSE.
	E. ASSISTS CHILDREN IN LEARNING AND PLAYING GAMES.
	F. CHECKS CREDIT OR LOAN FORMS FOR A BANK.

MATCH THE JOB TITLE ON LEFT WITH THE PICTURE ON RIGHT WHICH BEST REPRESENTS THE TOOLS AND MATERIALS A PERSON WITH THAT JOB TITLE WOULD USE. PUT THE LETTER OF THE SELECTED PICTURE BOX ON LINE BESIDE NUMBER ON LEFT.

_____1. DRAPERY SEAMSTRESS

_____2. DIETICIAN

A



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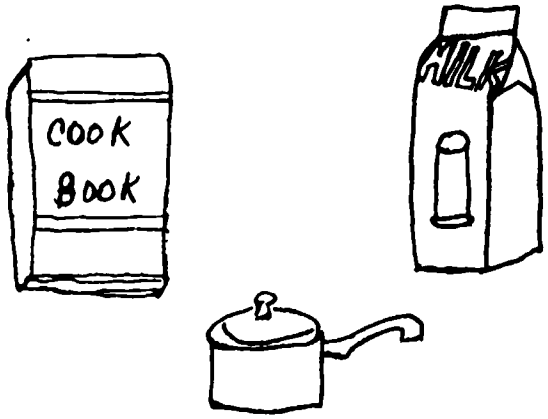

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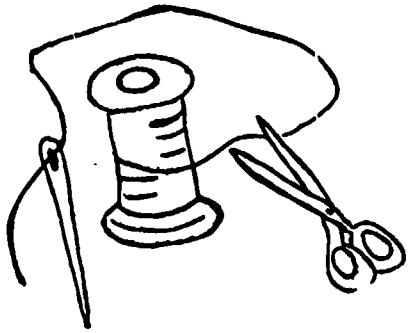

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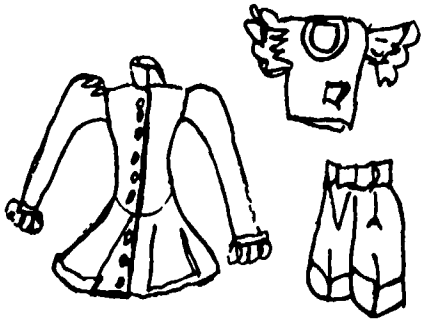
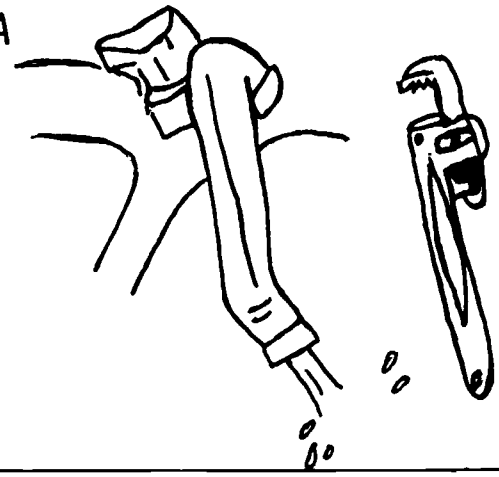


MATCH THE JOB TITLE ON LEFT WITH THE PICTURE ON RIGHT WHICH BEST REPRESENTS THE TOOLS AND MATERIALS A PERSON WITH THAT JOB TITLE WOULD USE. PUT THE LETTER OF THE SELECTED PICTURE BOX ON LINE BESIDE NUMBER ON LEFT.

_____3. PHOTOGRAPHER

_____4. DARKROOM TECHNICIAN

A



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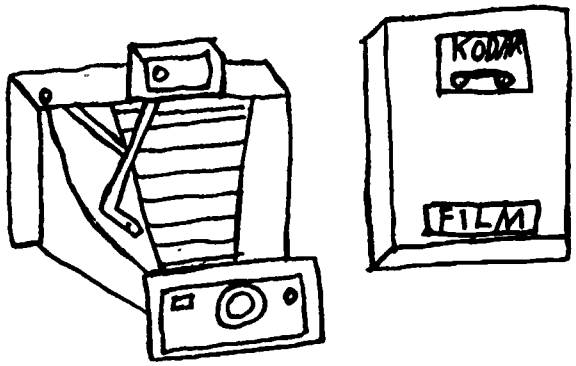

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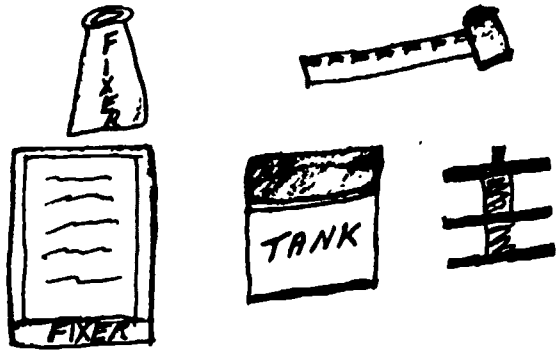

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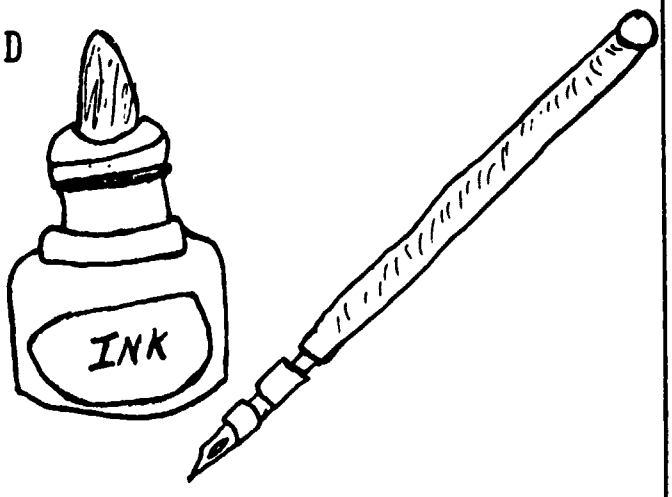
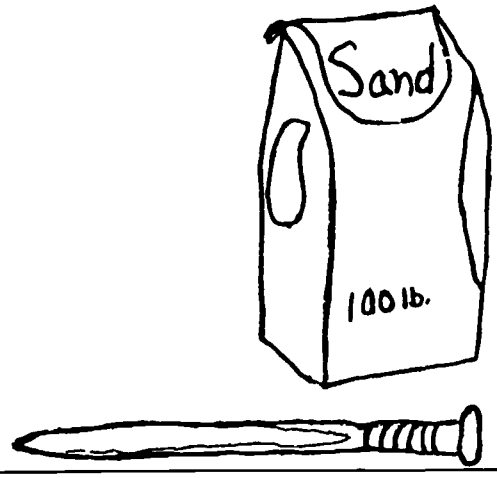


MATCH THE JOB TITLE ON LEFT WITH THE PICTURE ON RIGHT WHICH BEST REPRESENTS THE TOOLS AND MATERIALS A PERSON WITH THAT JOB TITLE WOULD USE. PUT THE LETTER OF THE SELECTED PICTURE BOX ON LINE BESIDE NUMBER ON LEFT.

_____5. CEMENT MASON

_____6. CARPENTER

A



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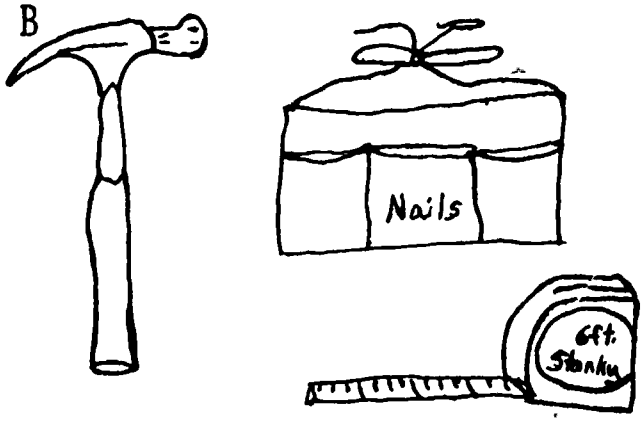

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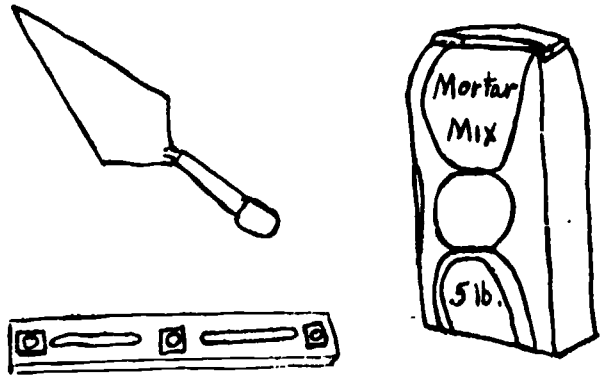

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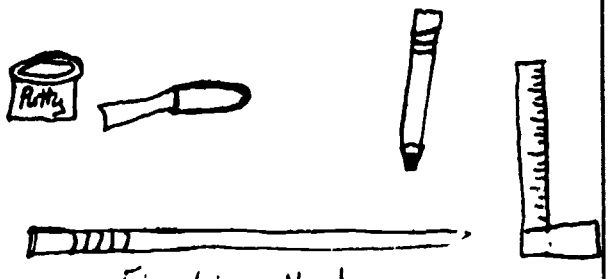


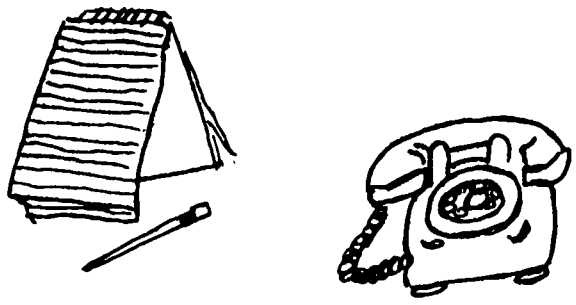
Finishing Nail

MATCH THE JOB TITLE ON LEFT WITH THE PICTURE ON RIGHT WHICH BEST REPRESENTS THE TOOLS AND MATERIALS A PERSON WITH THAT JOB TITLE WOULD USE. PUT THE LETTER OF THE SELECTED PICTURE BOX ON LINE BESIDE NUMBER ON LEFT.

_____7. RECEPTIONIST

_____8. BOOKKEEPER

A



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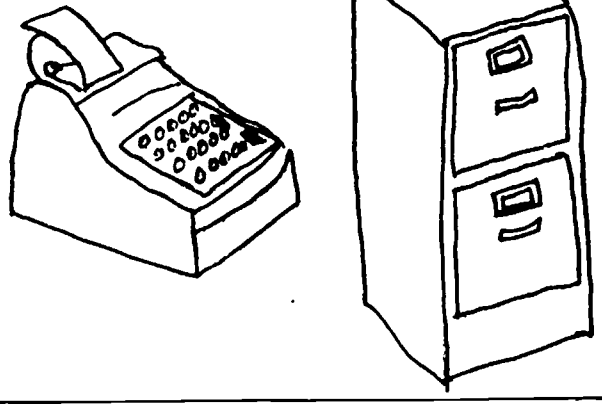

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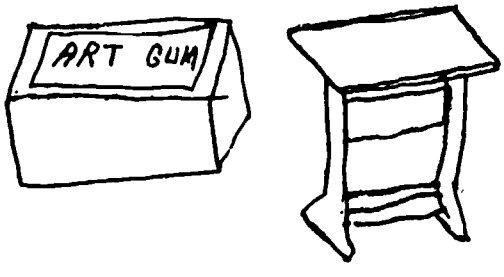
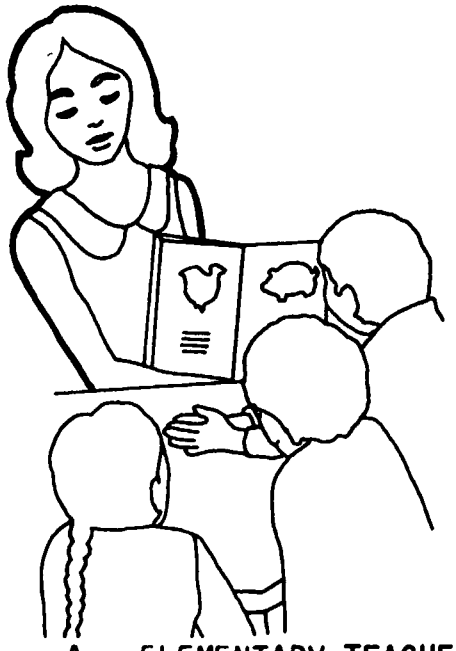


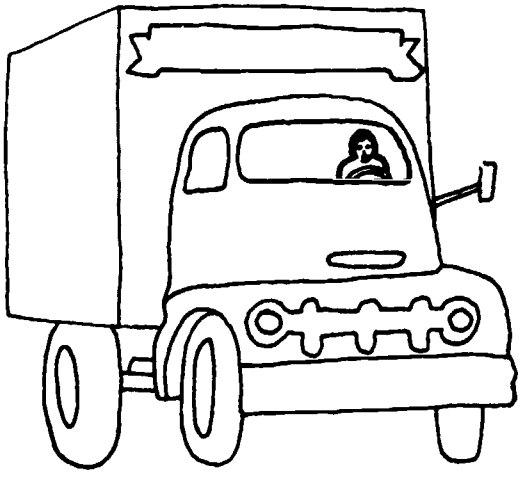
MATCH JOB TITLE ON LEFT WITH CAREER CLUSTER (GROUP OF RELATED CAREERS). PUT NUMBER OF CORRECT CAREER CLUSTER TO THE LEFT OF JOB TITLE.



1. BUSINESS AND OFFICE
2. FINE ARTS AND HUMANITIES
3. PUBLIC SERVICES
4. CONSUMER AND HOMEMAKING

____A. ELEMENTARY TEACHER

1. MANUFACTURING
2. TRANSPORTATION
3. ENVIRONMENT
4. CONSTRUCTION



____B. LOCAL TRUCK DRIVER

1. BUSINESS AND OFFICE
2. AGRI-BUSINESS AND NATURAL RESOURCES
3. ENVIRONMENT
4. PUBLIC SERVICES

_____C. COUNTY-AGRICULTURAL AGENT

1. MARKETING AND DISTRIBUTION
2. PERSONAL SERVICES
3. PUBLIC SERVICES
4. HEALTH

_____D. BARBER