PROGRAMS, '63
A Guide to Programed Instructional Materials Available to Educators by September 1963

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Editor
LINCOLN F. HANSON
with the assistance of
CAROL CHRISTMAN AND GERTRUDE SEIDEL

Information Division

Compiled and Produced by
Research Division
THE CENTER FOR PROGRAMED INSTRUCTION, INC.
in cooperation with the
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
This survey and report were made by
The Center for Programed Instruction, Inc.
365 West End Avenue
New York 24, New York

Pursuant to a contract with the Office of Education,
U.S. Department of Health, Education, and Welfare,
National Defense Education Act, Title VII, Part B,
OE-3-16-012

Superintendent of Documents Catalog No. FS 5.234:34015-63

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1963

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $2.50
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## GUIDE TO PROGRAMS

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INTRODUCTION

To assist educators in their selections of programmed instruction materials, the Office of Education, in the spring of 1962, commissioned the Center for Programed Instruction to prepare PROGRAMS '62: A GUIDE TO PROGRAMED INSTRUCTIONAL MATERIALS AVAILABLE TO EDUCATORS BY SEPTEMBER 1962 (OE 34015), as the first half of a two-part survey report. The second half, THE USE OF PROGRAMED INSTRUCTION IN U.S. SCHOOLS (OE 34022) followed some months later.

This newest edition, PROGRAMS '63, is the first part of a similar survey for the current year. It lists all materials which will be available in the fall of 1963. It should be noted that samples to be cataloged were chosen by the publishers themselves. The second part will report on how schools have been using materials which have been available for a year or more.

While a "stamp of approval" might be helpful to some in this relatively new field, experience confirms the belief that our present obligation primarily is to indicate the number, variety, and source of available programs. However, the joint committee of the American Educational Research Association, the American Psychological Association, and the Department of Audiovisual Instruction of the National Education Association, with the cooperation and support of the U.S. Office of Education, has expanded the previously published statement of policy on criteria for selection of programmed materials. The new statement is included as Appendix B of this volume.

The 1962 average per program cost of $10 to $15 remains unchanged. However, more short units or programed segments of courses, representing smaller initial investments are now available and will permit greater experimentation by teachers with limited budgets.

Both the Center for Programed Instruction and the Office of Education will welcome comments on the utility of PROGRAMS '63, along with suggestions as to how it might be improved.
Since Programs, ’62 provided a number of first analyses of programed material available, some of the present statistical data have been related to last year’s findings. Trends are, of course, premature, but it was felt that the user would want to see at least “two points on the curve.”

Following the sequence used on the publishers survey form (Appendix A), Figure 1 shows that this year’s 352 programs have the same general subject matter distribution as the 122 of 1962, but with a greater spread clearly emerging. Mathematics, while more than doubling in number of programs available (from 53 to 124) has actually dropped from its strong domination of 44% of last year’s available programed materials to a lesser but still major share (35%) of this year’s materials. With its wide range of inclusive subjects, from arithmetic through logic and computer programs (“Applied Math”), mathematics still represents the largest single category of programed materials available.

The sciences show a similar relative availability, having almost 3 times as many programs listed this year, and maintaining their previous portion (20%) of available materials.

Most interesting changes are the large absolute gains (in numbers) of programs in Business Education, Modern Language and “Other Non-Math” areas.

In continuing last year’s observation of short unitary programs (suggestive of many publishing and curricular possibilities), Figure 2 shows an expanded scale of programs under 1000 frames in length. The 300-400 frame unit appears to be emerging as at least one “module of in-
Figure 2
LENGTH OF PROGRAMS AVAILABLE

ADDITIONAL BREAKDOWN - PROGRAMS UNDER 1000 FRAMES

PERCENT OF PROGRAMS (DATA AVAILABLE ONLY FOR 1963)
struction," surpassed by no other equally narrow category of program length. For further evidence of this trend to shorter programs, the median length of last year's programs was around 2400 frames; the median length this year is just under 1000 frames.

Figure 3 shows the availability of machine vs. programmed formats, with growth in exclusive use of either format the principal change from last year. A far smaller proportion of programs is produced in both machine and text format. Over three-fourths of this larger crop of programs are available in text form; more than half are available only in text form. A substantial 40% of programs are available in machine format (again almost half of them for machines only), while last year's 62% "Available in Both Forms" has shrunk this year to 22%.

The proportion of programs of all lengths available in unit form has increased slightly; even with the tripling of absolute numbers last year's 20% has now become 23% of programs which are to be available in unit form. (However, 31% of the respondents did not answer this item.)
Figure 4

PROGRAMED TEXT COSTS

MACHINE PROGRAM COSTS

Cost: If one approximates from both length and cost figures, last year's 2500-frame text cost $12.50; roughly 200 frames for a dollar. This year's 1000-frame program appears to cost just under $5.00; therefore, the consumers' one-half cent cost per frame of programs appears remarkably stable in an otherwise hectic area of growth. Figure 4 provides a very rough comparison of the program cost.
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Types of Response used in programs of either text or machine formats are compared with last year's findings in Table 1. In contrast with the decreasing availability of text or machine formats for the same program, it is here that one may find evidence for a growing flexibility in what were once regarded as hard "schools" of program writing. Constructed Responses have increased in the "always used" category "never" for using Constructed Responses. The use of the Multiple Choice Responses is proportionately less, showing decrease both in the "always," and "never" categories and an increase in the "sometimes" used category. Branching seems to show the most stable proportions of all, being used "always," "never," and "usually" by very nearly the same percentages as last year.

In another matter of format, repeated requests within a program, as in reference use. While 30% of programs make no provision at all for easy references, 10% have both a Table of Contents and an Index.

Units tests are now available for almost 40% of the 1963 programs, final tests are available for 46%, but diagnostic ("pre") tests are acknowledged by only 14% of the program suppliers. It would seem that there still remains some doubt on the part of program producers as to the nature and purpose of diagnostic tests. The fact that claims made for gains as a result of the use of a program may be meaningless without such pretesting of knowledge covered by the program, plus the time saved in diagnosing areas not needed by some students, would seem to make such tests more desirable—and eventually, perhaps, more available.

Grade Level: Still only one program seems to be all that is available for (developed upon) the kindergarten level, but grades 1-6 have helped in the development of 16% of the programs available—many of which eventually are used above this range. Junior High School subject matter still commands the largest attention of the programers—with 18% of the programs currently developed in these grades. As was true last year, many of these will be found useful above and below grades seven and eight; the vast majority would appear useful for reasonably bright sixth graders. Nine per cent of this year's programs are college developed. Over a third of all the programs indicate that even in early trials they have been used on a greater variety of students than was originally intended. Last year's graph on intended grade usage was compounded of so many
extrapolations that comparison is difficult; however, the
general pattern seems to have changed but little. Last
year, publishers listed Intended Grade Level—this year we
have concentrated on the characteristics of the population
upon whom the program was developed and tested. Such
data would seem a safer base from which the user may do
his own extrapolating, in either direction. As a further encour-
agement to this use of programs "out of grade," 7% of the
programs were actually developed on populations for whom
they were intended, and 5% were given to similar student
populations, but 9% were given to populations above the in-
tended level, and 13% of the programs were successfully
tested on populations completely different from those for
whom the programs were developed:

In the matter of size of test populations, 83% of the
respondees omitted mention of number of students upon
whom the programs were developed and/or tested. Two
per cent used less than 15 students, 3% used up to 30,
another 3% used up to 100 students and 7% used between
100 and 200 students. Two per cent used over 300 students.
At some future time, lest mere numbers seem to contain
some magic in program development, we plan to show the
number of students used for each testing which resulted in
a major program revision. The number of revisions, even
if based on only a few students, may prove the more rele-
vant information to relay to users.

Time to complete each program (Figure 5), while similar
to last year’s distribution, has apparently dropped an average
of almost 10 hours through the middle length programs (note
reduction from 1962 of 11-20, 21-30, 31-40 hour percentages).
Fifty-four per cent of program data sheets showed time fig-
ures to be based "partly on data." Ten per cent admit to
guessing, another 11% declare their figures based "entirely
on data" but give no standard deviation, while 16% provided a
Mean Program Completion Time complete with standard de-

With such items we hope to help shape the data sup-
plied by publishers to educators, not in the false notion
that any of our indices, like error rate, cannot be manipu-
lated at will, but rather in hope that the most sincere at-
ttempts will be made to provide simple, yet precise and
meaningful data in the careful development of programed
materials. We would especially encourage thoroughness
with which programs are student developed and tested.
Possibly, in this area alone may come both the most unique as well as the major contribution of programmed instruction to the education of students. The value to teacher education is elsewhere more appropriately discussed, and may even be the larger overall effect, nevertheless, when the student is heard, not in the selection of objectives of teaching, but in determining the teacher’s success in achieving objectives, the corrective “feedback” of programs is perhaps unequalled in achieving, measuring and retaining successful communication.
SOME SUGGESTIONS FOR USING "PROGRAMS, '63"

One of the important distinctions a potential user may want to make in connection with programs on this list is whether or not a program is available for use without a teaching machine. In the vast majority of cases this is so. The reader is further directed to check the following items as discriminative clues for machine programs.

1. If listed first "For use in_____machine" (a few publishers appear willing to sell separate units of machine material, and their responses are thus entered).

2. If listed "specifically" or "only for____machine.

3. And perhaps the ultimate criterion—if a machine is mentioned under "Additional Material Required." (Cost data were requested, but not always supplied, for this item.)

Each entry consists of the following:

Subject matter—and, where supplied, approximate intended academic level. "Open" simply indicates that the content is the sole determinant of level.

Title, Author, and Publisher;
slightly edited for the format of this publication.

Text description usually has # of frames, cover, # of pages, and page size to give some picture of the nature of the material to be handled.

NOTE: Number of pages, number of frames and all cost figures should be considered only as order-of-magnitude figures; many suppliers so indicated. In supplying the cost of figures, many refused even to estimate; a blank or "?" has been inserted to so indi-
cate (the reader may wish to make his own rough guess from comparisons with similar frame and page count).

Even more than was true last year, many subjects are offered in unit form; in some cases the context, in other cases sheer-bulk, was the decisive factor; in either case such separate units are listed where available. Very often two consecutive programs (Algebra I and II; English 2600 and English 3200) are listed on the same page, although they are usually available as separate units. If in doubt, contact the publisher.

Teacher’s Manual and Test availability have been slightly edited for simplest indication to the user; all final availability (here projected as of September) should be ultimately checked with the publisher.

The Form of Response and Use of Branching are the simplest summary we could make of a small chart on the questionnaire, which contained far-from-uniform entries. In the future we hope to develop a form which can be reproduced directly.

Intended Population is indicated at the very top right of the page. New this year—the Developmental and/or Field Test Population(s), upon which the program was developed, or first field tested, is considered a more meaningful guide to potential users. Data for this item will vary widely; our eventual hope is that publishers will shortly include an age group, intelligence level and other distinguishing characteristics of these populations so that users may extrapolate with some confidence to their own student backgrounds and abilities. Ideally, the number of student data based revisions should be more meaningful than mere numbers of students in a field test without revision.

Prerequisites are usually quoted directly. Additional Material Required was intended to bring out the need for anything, other than the programed material itself, necessary to start a student to work (with his own pencil).
The time required to complete programs (Average Time) varies from complete data with standard deviation given through estimates to a simple guess.” The few responses with no check at all for this item have been listed as estimated. In the future the plan is to supply more test data. The few complete examples supplied by the present respondents have this year been included in order to encourage this easy and precise additional information.

The final item is simply to indicate the number of sample pages supplied (or selected from in the requested proportion of one page per thousand frames, or one page per 500 “scrambled” pages, per program). The greatest problems were presented by copy supplied by programers using Branching techniques; the nature of Branching requires turning from one page back or forward as indicated; some samples have been laid out in the hope of showing this feature, even at the expense of partial page extractions.

A last word: the Center is interested in all suggestions aimed at improving future editions. Any suggestions as to the kinds of information that will help the educator to evaluate programs of the type listed in this “guide” are respectfully solicited. The evaluation of programs is largely subjective at present and may remain so for some time to come. (One school system has evolved the ingenious list of questions for salesmen contained in Appendix C.) From the Center’s point of view any information which can be supplied to users enabling them to form their own opinions is highly desirable.

L.F.H.
ARITHMETIC

ADDITION AND SUBTRACTION
A Set of 11 Automated Workbooks
Prepared through the facilities of the Devereux Foundation.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 1584 frames, paperback, 18 pages
each book, 7" x 11". "Available only to special edu-
cation facilities for exploratory use. For further infor-
mation contact Dr. Henry Platt, Director of Training,
The Devereux Foundation, Devon, Pennsylvania."
For use in DEVEREUX TEACHING AID - MODEL 50,
$89.50, program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available; Coordinated with California Achieve-
ment Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade
schools.
Prerequisites: "Most booklets usable with students exhibit-
ing specific reading disabilities though this is naturally
not a requirement—neither is ability to write, so
physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid -
Model 50, $89.50; some developmental material avail-
able on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations.
Many students go through the book in one hour but
require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)
ARITHMETIC

ADDITION AND SUBTRACTION
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:

**Understanding Addition**

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ARITHMETIC

ELEMENTARY ARITHMETIC
Addition I and Subtraction I
RUTH B. ROSENBERG, Programmer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.)
(including three programs of choice for Subtraction I);
programs reusable, 200 frames each, $2.00-$2.50.
(For Addition I, machine may be marketed in retail
channels at this $20 combination price including 3 or
4 programs.)

Addition I: Constructed Responses usually used; some
Multiple Choice; no Branching.
Subtraction I: Constructed Responses usually used; some
Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(2 sample pages)
When you subtract, you take away something, and you have less than what you started with.

I had four pieces of pie, but then I ate one piece. Now I have less than I started with.

I had 5 doughnuts, but I ate one of them. Now I have 4 doughnuts left.

I have:

a. more than I started with.
b. less than I started with.

Press and hold the button of your choice.

Oh, no!
If I took one doughnut away by eating it, I have:

a. more than I started with.
b. less than I started with.

Press and hold the button of your choice.

Good work!
When I ate the doughnut, I took it away. Then, I had one doughnut less than I started with. The 4 doughnuts that I had left were _______ than what I started with.

Study the subtraction story below:

7 - 1 = 6

The above subtraction story may also be written as:

6 is one _______ than 7.
When you count, you may use counting words. Each counting word stands for the number that you count.

Zero, one, two, three, four, five, six, seven, eight, and nine are all counting words.

Each counting word has a counting figure that also stands for the number that you count.

Zero, one, two, three, four, five, six, seven, eight, and nine are counting figures.

0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are counting figures.

Pictures, too, can show numbers.

The Indians in North America used pictures to show numbers.

Each sun showed one day; so, three suns showed three days.

(Illustration)

You can write counting words and figures to show numbers; so you do not need to draw pictures.

Each time you count a number of things, you use the counting words, or the figure, to tell the number that you have counted.

The counting word three has a figure, or the number 3, that stands for the number of things that you count.

To show the number that you count, you may use a counting word or a figure.

How many kites do you see here?

You may write the counting word, or the figure, to stand for the number of kites.

(Illustration)
ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: ADDITION AND SUBTRACTION FACTS
Using Numbers 1-10
DONALD T. TOSTI
DONALD BERTHOLOMEY, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1,375 frames, paperback, 303 pp.,
8 1/2" x 11", $11.00.
For use in MIN/MAX machine, $25.00; program reusable,
$10.00.
Teacher’s Manual: General Manual available for all
TMI-Grolier programs.
Final Test included.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Average age 5.5 years; average school grade: .9.”
Prerequisites: “Ability to identify groups of objects up to
ten, and to be able to recognize the numerals 1 through 10.”
Average Time: 12-16 hours (based entirely on data);
standard deviation, 4.16 hours.
(1 sample page)
# ARITHMETIC

## ELEMENTARY ARITHMETIC SERIES: ADDITION AND SUBTRACTION FACTS

Using Numbers 1-10

Tosti, Bertholomey; TEACHING MATERIALS CORP.

one sample page:

### Adding by hundreds, Always keep the decimal point lined up vertically.

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<tr>
<td>1. 0.65</td>
<td><strong>HOWN_MANY inches of rain has fallen?</strong></td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>1.71 in.</td>
<td>01.7 in.</td>
</tr>
<tr>
<td></td>
<td>1.71 in.</td>
<td>171. in.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. 0.53 + 0.36</th>
<th>Two days of rain dumped __________ inches of water.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.89 in.</td>
<td>89. in.</td>
<td></td>
</tr>
<tr>
<td>0.89 in.</td>
<td>8.9 in.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 1.73 lbs of butter fat</th>
<th>What is the total lbs. of butter fat?</th>
<th>+0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.81 lbs.</td>
<td>181. lbs.</td>
<td></td>
</tr>
<tr>
<td>1.81 lbs.</td>
<td>181. lbs.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 47&quot; + .38&quot; =</th>
<th>How many inches of rain did we have?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>47.38 in.</td>
<td>47.38 in.</td>
<td></td>
</tr>
<tr>
<td>473.8 in.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. 6.70 lbs. + 4.38 lbs.</th>
<th>How many lbs of butter fat did these two cows give?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11.08 lbs.</td>
<td>11.08 lbs.</td>
<td></td>
</tr>
<tr>
<td>1.108 lbs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. 3.84 in. mo. of June + 4.60 in. mo. of July</th>
<th>How much rain did we have in June and July?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8.44 in.</td>
<td>8.44 in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. 7.63 oz. + .42 oz.</th>
<th>John mixed these two chemicals together. What was their total weight?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8.05 oz.</td>
<td>8.05 oz.</td>
<td></td>
</tr>
</tbody>
</table>

Add the following examples:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8. 39.8 + .45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40.25</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9. .51 + .65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.16</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10. 4.53 + .21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.74</td>
<td></td>
</tr>
</tbody>
</table>

---

Copyright 1961, ASTRA CORPORATION
ARITHMETIC

DECIMALS
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 760 frames, $15.00
Multiple Choice Responses always used; no Constructed Responses; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other using Populations: Nursing schools.
Prerequisites:
Additional material required: AUTOSCORE machine, $150.00
Average Time:
Next Revision:
(1 sample page)
ARITHMETIC

DECIMALS
Astra Staff; ASTRA
one sample page:

---

---
ARITHMETIC

DECIMALS AND PERCENT
WILLIAM HAUCK, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1000 frames, $\ldots$
Teacher’s Manual available.
Table of Contents.
Constructed Responses always used; some Branching;
no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental: 10 sixth grade students. Test: 1 class
of sixth grade students; 2 classes of seventh grade
students from two junior high schools.”

Prerequisites: None
Average Time: 21 hours (est.).
Next Revision: June, 1963.
(1 sample page)
ARITHMETIC

DECIMALS AND PERCENT

Hauck, Moore, Smith; McGRAW-HILL BOOK CO.

One sample page:

(Preliminary Version)

Q13-11 567 ÷ 100
To work the above problem you could move the decimal point in 567 _ decimal places to the _ and get _.
A13-11 two; left; 5.67

Writing Zeros in the Dividend to Divide by 10, 100, 1000, etc.

Q13-12 Work this problem: 6.1 ÷ 1000, by long division until the remainder is zero. Show your work.

A13-12

\[
\begin{array}{c}
1000/6.1000 \\
-6.000 \\
\hline
1000 \\
-1000 \\
\hline
0
\end{array}
\]

Q13-13 Rather than work this problem: 6.1 ÷ 1000 = .0061 by long division, you could have moved the decimal point in 6.1, _ decimal places to the _ to get _.
A13-13 three; left; .0061
DECIMALS AND PER CENTS
M. DANIEL SMITH, Coordinator of Self Instruction,
Earlham College.
Published by ALLYN AND BACON, Inc.
150 Tremont St., Boston 11, Massachusetts

Programmed text, 1000 frames, paperback, 176 pp., 8-1/4\" x 11\", $.

Teachers Manual.
"Test items included in program at end of each of 8 sections."

Constructed Responses usually used; some Multiple Choice;
some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental 6 Field test of preliminary edition
ca. 125."

Prerequisites:
Average Time: 10 hours (est.).
Next Revision: Not determined.
(1 sample page)
### ARITHMETIC

#### DECIMALS AND PER CENTS

Smith; ALLYN AND BACON

one sample page:

(Preliminary Version)

<table>
<thead>
<tr>
<th>Sample Problem, from Section VIII of Decimals and Percents, H. Daniels and Smith</th>
<th>Answer on next page</th>
</tr>
</thead>
<tbody>
<tr>
<td>What percent of nine is eleven?</td>
<td>( \frac{1}{4} )</td>
</tr>
<tr>
<td>( \square \cdot 9 = 18 )</td>
<td></td>
</tr>
</tbody>
</table>

What percent of nine is eleven?

\( \square \cdot 9 = 18 \)

 Remember, the "\(^{\circ}\)" means that you should do this item only if you missed the last one.

What percent of eleven is sixty-five?

\( \frac{12}{95} \)

How we will review the solution of equations from Section VII

If \( \square \cdot 9 = 3 \), then \( \square = \)

(don't bother to do the division)

If \( \square \cdot 42 = 7 \), then \( \square = \)

(don't forget that "\(^{\circ}\)" means)

\( \square \cdot 42 = 7 \)

How back to the word problems again; just write the equation, don't solve it.

Sixteen is what percent of forty?

\( \frac{16}{40} = \frac{1}{2} \)

What is what percent of twenty? (just write the equation)

\( \frac{16}{40} = \frac{1}{2} \)

Now write the equation and solve it for the missing quantity.

Five is what percent of five?

If you are completely confused by the last problem, then ask your teacher for extra help. If you missed it, but think you can get another one like it, do the next item which is marked with a "\(^{\circ}\)." If you solved it correctly, however, go on to some more difficult problems of this type, and then the next page.
ARITHMETIC

ELEM.

ELEMENTARY ARITHMETIC SERIES: DECIMAL NUMBERS
POLO C. DE BACA
DONALD T. TOSTI, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programmed text, 2,735 frames, paperback, 564 pp., 8-1/2" x 11",
bound in 2 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"10 and 11 year old 8th graders. Average IQ 104."
Prerequisites: "Fourth grade reading level plus facility in fundamental arithmetic skills."
Average Time: 15-20 hours (based entirely on data);
standard deviation, .868 hours.
(2 sample pages)
<table>
<thead>
<tr>
<th>Question</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Write the number &quot;sixty-seven hundredths&quot; as a decimal fraction.</td>
</tr>
<tr>
<td>02</td>
<td>Write the number &quot;forty-five hundredths&quot; as a decimal fraction.</td>
</tr>
<tr>
<td>03</td>
<td>Bill rode his bike five-tenths of a mile to school. Then he rode six-tenths of a mile farther to Bill's house. How far did he ride altogether? Use decimal fractions.</td>
</tr>
<tr>
<td>04</td>
<td>Write the number &quot;ten hundredths&quot; as a decimal fraction.</td>
</tr>
<tr>
<td>05</td>
<td>Divide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>.67 + .6</td>
<td>1.3</td>
</tr>
<tr>
<td>.46 + .54</td>
<td>1.0</td>
</tr>
<tr>
<td>.3 + .7</td>
<td>1.0</td>
</tr>
<tr>
<td>.1 + .9</td>
<td>1.0</td>
</tr>
</tbody>
</table>

692-698 O-63-3
<table>
<thead>
<tr>
<th>100000</th>
<th>100000</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 places</td>
<td>5 places</td>
</tr>
<tr>
<td>0.000618 = 0.618</td>
<td>0.41234 = 0.41234</td>
</tr>
<tr>
<td>6 zeros</td>
<td>5 zeros</td>
</tr>
</tbody>
</table>

1000000 See, there are 5 zeros.

1.6779 = 1.6779
1.6779 = 1.6779

5 zeros See, there may zeros are here.

105000

<table>
<thead>
<tr>
<th>160</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.214 = 0.214</td>
<td>0.2101</td>
</tr>
<tr>
<td>10085</td>
<td>10085</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>20</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle one.</td>
<td>Circle the right fraction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>20</th>
<th>10008</th>
</tr>
</thead>
<tbody>
<tr>
<td>10009</td>
<td>10009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>32412</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>20942</th>
<th>20942</th>
</tr>
</thead>
<tbody>
<tr>
<td>20942</td>
<td>20942</td>
</tr>
</tbody>
</table>
ARITHMETIC

PROBLEMS IN PERCENTAGE
LEWIS J. PEARSSALL, Programer, GPTC
AMARYLLIS D. HUNT, Programer, GPTC
JACOB REGER, Editor, GPTC
WAYNE T. ALCOCK, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1200 frames, paperback, 150 pp.,
8-1/2" x 11", $.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 5th-8th grade students. Field testing: 6th-7th grade students."
Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)
What is 3% of 90?
Is the answer a decimal number?

3% of 90 = 0.90
= 2.7

(Yes) Yes No

What is 5% of $40.00?

5% of $40.00 = 0.02
= 2

Write the number that is 10% of $101.00.
Is the answer greater than $10.00? Circle Yes or No.

10% of $101.00

Yes No

Jim receives an allowance of $3.00 every week.
What is 25% of Jim's allowance?

25% of $3.00 =

Sue's weekly bus fare is $4.00. How much is 40% of Sue's bus fare?

40% of $4.00 =

18
ARITHMETIC

ELEM.

ELEMENTARY ARITHMETIC SERIES: FRACTIONS:
BASIC CONCEPTS
GAYLA GLASCOCK
JAMES L. EVANS, both of Teaching Materials Corporation
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programmed text, 1,718 frames, paperback, 424 pp., 8-1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAC II machine, $25.00; program re-usable, $10.00.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Ages 9 years 3 months to 9 years 7 months, 4th grade students."
Prerequisites: "Third grade reading and arithmetic ability."
Average Time: 15-25 hours (based entirely on data);
standard deviation, 2.94 hours.
(1 sample page)
ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: FRACTIONS:
BASIC CONCEPTS
Glascock, Evans; TEACHING MATERIALS CORP.
one sample page:

<table>
<thead>
<tr>
<th>116</th>
<th>3 of 4 parts are black.</th>
<th>both</th>
<th>both</th>
<th>both</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>4 equal parts which make a whole are called:</td>
<td>both</td>
<td>both</td>
<td>both</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>Which picture shows 3 fourths black?</td>
<td>both</td>
<td>both</td>
<td>both</td>
</tr>
<tr>
<td>119</td>
<td>How many fourths are black?</td>
<td>both</td>
<td>both</td>
<td>both</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>The hand is taking:</td>
<td>both</td>
<td>both</td>
<td>both</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ARITHMETIC

6th & 7th grades

FRACTIONS
WILLIAM HAUCK, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.

Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1000 frames, $\ldots$
Teacher's Manual available.
Table of Contents.
Constructed Responses always used; some Branching;
no Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental: 10 sixth grade students.
Test: 1 class of sixth grade students; 2 classes of
seventh grade students from two junior high schools.”

Prerequisites: None
Average Time: 23 hours (est.).
Next Revision: June, 1963.
(1 sample page)
Q1. In this section you will learn the meaning of the word fraction.

Q2. This is one rectangle:

Here is one rectangle divided into \_\_\_ equal parts.

A2. 3

Q3. This is the same rectangle all of which is divided into 3 equal parts. How many of the three parts are shaded (1, 2, or 3)?

A3. 1

Q4. If you were to write a note to tell how much of the above rectangle is shaded, you could draw the rectangle on the note and write beneath it: "One out of three equal parts of this whole rectangle is shaded."
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other using population(s): Schools of nursing.
Prerequisites:
Additional materials required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)
**ARITHMETIC**

**FRACTIONS**

Astra Staff; ASTRA

one sample page:

---

<table>
<thead>
<tr>
<th></th>
<th><strong>Inversion Method</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To divide fractions using inversion we invert (flip over) the</td>
<td><strong>division</strong></td>
</tr>
<tr>
<td></td>
<td><strong>dividend</strong></td>
</tr>
<tr>
<td></td>
<td><strong>quotient</strong></td>
</tr>
<tr>
<td>2. In the problem ( \frac{1}{2} + \frac{3}{2} ) which is the divisor?</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{3}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>3. In the problem ( \frac{2}{3} ) which is the divisor?</td>
<td>( \frac{2}{3} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{2}{3} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{2}{3} )</td>
</tr>
<tr>
<td>4. ( \frac{1}{2} ) inverted becomes</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>5. ( \frac{1}{2} \div \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>6. ( \frac{1}{2} + \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>7. ( \frac{1}{2} + \frac{3}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{3}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{3}{2} )</td>
</tr>
<tr>
<td>8. ( \frac{1}{2} \div \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>9. ( \frac{1}{2} + \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>10. ( \frac{1}{2} + \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{2} )</td>
</tr>
</tbody>
</table>

---
ARITHMETIC

FRACTIONS I & II
FRANK C. GENTRY, Consultant
JAMES V. DEVINE, Programer, General Programmed Teaching Corporation
LINDA LUE DORAN, Programer, GPTC
AMARYLLIS D. HUNT, Programer, GPTC
WAYNE T. COCK, Editor, GPTC
MARY W. CHITN, Editor, GPTC
JAMES RUDDLE, Editor, GPTC

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Fractions I: Programed text, 1816 frames, paperback,
365 pp., 8-1/2" x 11", $...
Fractions II: Programed text, 1700 frames, paperback,
340 pp., 8-1/2" x 11", $...
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Fractions I: Multiple Choice Responses usually used;
some Constructed Responses; no Branching.
Fractions II: Constructed Responses usually used; some
Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"4th, 5th, 6th grade students used in developmental testing at Albuquerque, New Mexico; Elementary students used in field testing at Roanoke, Virginia."
In addition for Fractions I, "5th grade students used in field testing at Ventura, California and Hobbs, New Mexico."
Prerequisites: "4th grade reading level; knowledge of addition, subtraction, multiplication, division of whole numbers."
Average Time: Fractions I: 15 hours (based entirely on data); Fractions II: 12 hours (based entirely on data).
Next Revision: 1968.
(2 sample pages)
ARITHMETIC

FRACTIONS I & II
Gentry, Devine, Doran, Hunt, Alcock, Utton, Ruddle;
ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:

- Reduce $\frac{2}{4}$ if it is possible to do so.
- Reduces $\frac{3}{11}$ if it is possible.
- Can $\frac{5}{7}$ be reduced?

Reduce $\frac{4}{9}$ the quick way by dividing with the common factor.

To reduce the quick way, draw lines through the common factors to show that both the numerator and denominator have been _________ by their common factor.

Added, multiplied, subtracted, divided
<table>
<thead>
<tr>
<th>431</th>
<th>Divide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\frac{12}{9}$</td>
</tr>
</tbody>
</table>

**Circle the mixed number that represents the number of pies.**

<table>
<thead>
<tr>
<th>433</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$3\frac{2}{3}$</td>
<td>$2\frac{3}{4}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>433</th>
<th>Multiply</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{3}{4} \times \frac{1}{3} \times \frac{3}{4}$</td>
<td></td>
</tr>
</tbody>
</table>

**Circle the mixed number that represents the number of blocks.**

<table>
<thead>
<tr>
<th>434</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$2\frac{4}{9}$</td>
<td>$2\frac{1}{4}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>435</th>
<th>Reduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{6}{8}$</td>
<td></td>
</tr>
</tbody>
</table>
FRACTIONS
A Basic Course in Arithmetic
BETTY K. FRIEL, U.S.I. Educational Science Division.
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York, N.Y.

Programed text, 459 frames, hardcover, 391 pp., 8 1/4" x 5 3/8", $______.
A similar program, FRACTIONS, A Review Course, is available in TM format.
Published by EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES,
250 Park Avenue, New York, N.Y.
For use in AUTOTUTOR MARK I, $1,250; program reusable,
600 frames, $65.00.
Table of Contents, programed text and machine program;
Index, programed text.
Unit and Final Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisites:
Additional material required: Pencil and paper.
Average Time: 8-10 hours (est.).
Next Revision: "Not scheduled."
(1 sample page)
YOUR ANSWER: No, each part is not $\frac{1}{4}$ of the unit.

You are correct. In order to use a fraction, we must have equal parts to describe. When there are two equal parts in a unit, each part is called one-half; when there are five equal parts in a unit, each part is called one-fifth; when there are sixteen equal parts in a unit, each one is called one-sixteenth, and so on.

Important Note: Diagrams used on this image and others in this film represent ideas of things; they are not meant to be pictures of things. They are used to help you visualize FRACTIONS. A diagram is a way of showing an idea (abstract) on paper (concrete).

One of these diagrams shows the idea of $\frac{1}{8}$ of a unit.

Choose the diagram in which the shaded part is $\frac{1}{8}$ of the unit.
ARITHMETIC

FRACTIONS
A Set of 14 Automated Workbooks
Prepared through the facilities of the DEVEREUX FOUNDATION.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 2016 frames, paperback, 18 pp.,
each book, 7" x 11". "Available only to special educa-
tion facilities for exploratory use. For further infor-
mation contact Dr. Henry Platt, Director of Training,
The Devereux Foundation, Devon, Pennsylvania.
For use in DEVEREUX TEACHING AID - MODEL 50,
$89.50; program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit test(s) available; coordinated with California Achieve-
ment Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching usually used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade
schools.
Prerequisites: "Most booklets usable with students exhibit-
ing specific reading disabilities though this is naturally
not a requirement—neither is ability to write, so
physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid -
Model 50, $89.50. Some developmental material avail-
able on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations.
Many students go through the book in one hour out require
several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)
ARITHMETIC

FRACTIONS
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:

```
one whole
one half  one half

Set at position 0

Look at the chart at the top of the page. The top strip is
one half
one whole
two halves
one fourth

The second strip is divided into eight equal parts. Each part in the bottom strip is
each part in the bottom strip is
two halves
one third
one fourth

The second strip is divided into
thirds
fourths
halves

The scale is as long as
in the bottom strip

1 2 3
2/2 1/2

692-468 O-63-4
31
```
ARITHMETIC

UNDERSTANDING FRACTIONS
THORVALD ESSENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 1100 frames, paperback, 200 pp., 5" x 8", $____.
“Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter.”
Teacher’s Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Elementary.”
Prerequisites: “Mastery of addition and subtraction facts. Mastery of easier multiplication and division facts. Mastery of simple computational processes involving whole numbers.
Additional material required: “Response device described above.”
Average time: 20 hours (est.).
Next Revision: “Unknown.
(1 sample page)
ARITHMETIC

UNDERSTANDING FRACTIONS
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS
one sample page:

SAMPLE FRAMES: UNDERSTANDING FRACTIONS

2 is what fraction of 4? It is 1/2.
2 is what fraction of 6? It is 1/3.
2 is what fraction of 8? It is 1/4.

Now we see that the fraction changes, using the same number (2), if the number of parts in the group changes.

If you and I baked four cookies and you ate one of them, what fraction would tell what part of the cookies you ate?

Think what your answer is and then dial a-c to see if you are correct.

Since you ate one of the four cookies in the whole group we baked, the correct fraction would be 1/4.

In other words, you ate 1/4, or 1 of the 4 cookies we baked.

Now let's go on and learn about mixed numbers. We have talked before about fractions. We have talked before about whole numbers.

A mixed number is a whole number and a fraction written together.

These are all mixed numbers: 3 1/2 2 3/8 4 1/4

Whenever you write any whole number with a fraction, it is a mixed number.

1/4 is a fraction.
7 is a whole number.
7 1/4 is a mixed number.

Which of these is a mixed number?
1-j 1/2
e-c 13 1/2

33
MISCELLANEOUS ARITHMETIC

ARITHMETIC I and II
PROFESSOR KRAKOW
MARTIN MEO, New York University
ALEXANDER SCHURE, President, N. Y. Institute of
Technology
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95;
program not reusable, 500 frames in I, 500 in II, I or
II included in price of machine.
Constructed Responses usually used; some Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)
ARITHMETIC II

31. Let us arrange some fractions in order of sizes. The largest fraction is on the left, and the smallest on the right. Fill in the missing fractions.

\[
\frac{1}{2}, \frac{1}{3}, \frac{1}{5}, \frac{1}{6}, \frac{1}{8}, \ldots, \frac{1}{4}, \frac{1}{7}, \frac{1}{9}
\]

32. \(\frac{1}{20}\) is \underline{smaller} than \(\frac{1}{15}\).

\(\frac{1}{17}\) is \underline{larger} than \(\frac{1}{22}\).

33. \(\frac{1}{9}\) is smaller than \(\frac{1}{5}\) because it has a larger \underline{denominator}.

34. Because \(\frac{1}{4}\) has a \underline{denominator} than \(\frac{1}{18}\), it is the \underline{smaller} fraction.
MISCELLANEOUS ARITHMETIC

ARITHMETIC 22
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 22,780 frames, paperback, 756 pp.,
5" x 7", available in 21 separate units at $3.75 each.
For use in SPEED machine, program reusable, $210.00.
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 & $850.
Average Time: 50 hours (est.).
Next Revision:
(1 sample page)
MISCELLANEOUS ARITHMETIC

ARITHMETIC 22
Coursey; EDUCATION ENGINEERING
one sample page:

CHANGING DECIMALS TO PER CENTS

Changing a decimal to per cent is just the opposite of changing a per cent to a decimal fraction. We have already done this without developing any rule for it.

Suppose we want to change .05 to per cent. If we knew how many hundredths .05 is equivalent to we know its equivalent in per cent. Thus .05 = \( \frac{5}{100} \) and therefore equals 5%.

Likewise .07 = \( \frac{7}{100} \) = .07%.

By observing these examples the rule can clearly be seen. To change a decimal fraction to per cent, move the decimal point two places to the right.

An even more if necessary.

Change each of the following decimals to per cents. Then give the sum of each of the five groups of per cents.

1. (a) .42 (b) .06 (c) .46 (d) .78
2. (a) .0005 (b) .09 (c) .49 (d) .25
3. (a) .25 (b) .73 (c) .04 (d) .52
4. (a) .7 (b) .62 (c) .34 (d) .11
5. (a) .46 (b) .03 (c) .50 (d) .27

ANSWERS

1. .507 6. 207.05
2. .5972 7. .9932
3. 2.19838 8. .9920
4. .469 9. 1001.4
5. 1.051.3 10. .0133

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MISCELLANEOUS ARITHMETIC

ARITHMETIC U-3008
UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION
Published by UNIVERSAL TEACHING MACHINE
INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program
reusable, 2160 frames, machine and program, $25.00
(school discount).

Table of Contents.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade Level - 2-6."

Prerequisites: None.
Average Time: 28 to 32 hours (est.).
Next Revision: August, 1963.
(2 sample pages)
### MISCELLANEOUS ARITHMETIC

**ARITHMETIC U-3008**  
Universal Electronics Laboratories Corporation;  
UNIVERSAL TEACHING MACHINE INSTITUTE  
2 sample pages:

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>This special group has how many dots in it?</td>
<td>10</td>
</tr>
<tr>
<td>56</td>
<td>Groups of 10 are very important in our number system.</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>The two figures we use to write the number 10 are 1 and __.</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>The 1 in the number 10 means one group of ten things.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>How many groups of 10 dots are here?</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>The 0 in the number 10 means that we do not have any units left.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Here we have just enough dots to make one group of __.</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Here are 12 dots.</td>
<td>10 or ten</td>
</tr>
<tr>
<td></td>
<td>The figure 1 in the number 12 tells us that we have one group of __.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>The 2 in the number 12 tells us that we have 2 units left. The number 12 means we have 1 group of ten with 2 __ left.</td>
<td>units</td>
</tr>
</tbody>
</table>
121. 53 is a number that has 2 places in it. There is a 5 in one place and a ________ in the other place.

122. The 5 in the number 53 is in the ________ place.

123. The 3 in the number 53 is in the ________ place.

124. In the number 47, the 7 is in the ________ place. It tells how many ________ are left.

125. The 4 in 47 tells how many groups of ten there are. The 4 is in the ________ place.

126. 47 is a two-place number. One place is called the tens' place and tells how many groups of ________ there are.
MISCELLANEOUS ARITHMETIC

ARITHMETIC OF DIRECTED NUMBERS
EUGENE D. NICHOLS
ROBERT KALIN
HENRY GARLAND, all of Florida State University.
Published by HOLT, RINEHART AND WINSTON,
383 Madison Ave., N.Y. 17, N.Y.

Programed text, 413 frames, paperback, 112 pp., 7" x 10", $.96.
Teacher's Manual available, $.16.
Table of Contents.
Final Test included.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grades 7 thru 12."
Prerequisites: "Fundamental operations with whole numbers and fractions; basic notions of set theory helpful."
Average Time: 2-4-1/2 hours (est.).
Next Revision: Unknown.
(1 sample page)
Suppose we had the problem \( x + 3 = 5 \). If you used the number line to help find the missing directed number, you would be looking for the length and direction of the finite arrow, like this:

\[ -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \]

Or, by the Commutative Law, you could change the problem to \( 3 + x = 5 \).

Using either form of the problem, find the missing directed number in \( x + 3 = 5 \).

Stop

Do the following problems. Draw your own arrow or a picture of the number line only if you need to.

(a) \( +4 + ? = +5 \)
(b) \( +4 + ? = +1 \)
(c) \( +4 + ? = 0 \)
(d) \( +4 + ? = -1 \)

Stop

Do the following. (Use a number line only if you need to.)

(a) \( -4 + ? = -5 \)
(b) \( -4 + ? = -1 \)
(c) \( -4 + ? = 0 \)
(d) \( -4 + ? = +1 \)

Stop

Do the following. (Use a number line only if you need to.)

(a) \( +1 \)
(b) \( -3 \)
(c) \( -4 \)
(d) \( +5 \)

Stop

Do the following. (Use a number line only if you need to.)

(a) \( +1 \)
(b) \( +3 \)
(c) \( +4 \)
(d) \( +5 \)

Stop

42
MISCELLANEOUS ARITHMETIC

390 ARITHMETIC FACTS
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 2960 frames, $40.00 (eight separate sections).
Multiple Choice Responses always used; no Constructed Response; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)
### 390 ARITHMETIC FACTS

**Astra Staff; ASTRA**

one sample page:

#### "A.S" Table Addition

<table>
<thead>
<tr>
<th>Number</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 + 1</td>
<td>3</td>
</tr>
<tr>
<td>2 + 2</td>
<td>4</td>
</tr>
<tr>
<td>1 + 1</td>
<td>2</td>
</tr>
<tr>
<td>3 + 1</td>
<td>4</td>
</tr>
<tr>
<td>5 + 1</td>
<td>6</td>
</tr>
<tr>
<td>0 + 1</td>
<td>1</td>
</tr>
<tr>
<td>9 + 2</td>
<td>11</td>
</tr>
<tr>
<td>1 + 9</td>
<td>10</td>
</tr>
<tr>
<td>3 + 2</td>
<td>5</td>
</tr>
<tr>
<td>2 + 7</td>
<td>9</td>
</tr>
</tbody>
</table>

*Copyright 1961, ASTRA Corp.*
MISCELLANEOUS ARITHMETIC  Jr. H.S.

ARITHMETIC OF THE WHOLE NUMBERS
JAMES A. SMITH, Britannica Center for Studies in Learning
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programmed text, 1,582 frames, paperback, 335 pp., 8-1/2" x 11-1/2", $9.75, available in 2 separate units.
For use in TEMAC BINDER $1.25; program reusable, $8.50.
Teacher's Manual available, $.75.
Table of Contents.
"Suggested tests only are available. Non-normed."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): "The student population of the eighth grade at Roanoke City Public Schools."
Prerequisites: None
Average Time: 20 hours (est.).
No Revision.
(1 sample page)

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MISCELLANEOUS ARITHMETIC

ARITHMETIC OF THE WHOLE NUMBERS
Smith; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:

22. The expression, 10 + 6, represents the number which is obtained when the whole number 10 is divided by the whole number 6.

23. The symbols +, -, and * indicate four operations which can be performed with whole numbers. These operations are addition, subtraction, multiplication, and division.

24. When numbers are added, the result is called the sum of the numbers that are added. For example, 6 is the sum of 2 and 4.

25. _______ is the sum of 8 and 4.

26. 52 is the _______ of 75 and 7.

27. We also use small letters, such as a, b, c, x, y, and z, to refer to whole numbers. Thus, if a and b are whole numbers, a + b is the sum of _______ and _______.

28. Let x and y be whole numbers. Then x + y is the _______ of the numbers x and y.

29. 15 is the sum of 8 and _______.

30. 23 is the _______ of 12 and 11.

31. When numbers are multiplied, the result is called the product of the numbers that are multiplied. For example, 14 in the _______ of 7 and 2.

32. _______ is the product of 4 and 5.

33. 15 in the _______ of 3 and 5.

ARITHMETIC OF THE WHOLE NUMBERS
MISCELLANEOUS ARITHMETIC

BASES AND NUMERALS
An Introduction to Numeration
VERNON L. DAUSCH, Millburn Junior H. S.
MARTIN M. MOSKOWITZ, Mathematics Department,
Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Department, Weequahic
H.S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY, 60 Fifth Avenue,
New York 11, New York
Programed text, 600 frames, paperback, 144 pp., 8-1/4"
x 11", $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy,
program can be reusable.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Average 7th and 8th grade students. Some testing
of students in Grades 5 and 6.”
Prerequisites: “Programs will fit in with both “modern”
and traditional backgrounds.”
Average Time: 15-18 hours (est.)
Next Revision:
(1 sample page)
34. In base five \( 200_n + 30_n = \quad \_ \_ \_ \_ \_ \_ n \).

35. And \( 320_n + 4_n = \quad \_ \_ \_ \_ \_ \_ n \).

36. Fill in the sums in each of the following.

   1. \( 220_n + 3_n = \quad \_ \_ \_ \_ \_ \_ n \).

   2. \( 40_n + 5_n = \quad \_ \_ \_ \_ \_ \_ n \).

   3. \( 1000_n + 300_n + 10_n = \quad \_ \_ \_ \_ \_ \_ n \).

   4. \( 2000_n + 100_n + 30_n + 6_n = \quad \_ \_ \_ \_ \_ \_ n \).

   5. \( 1000_n + 400_n + 20_n + 8_n = \quad \_ \_ \_ \_ \_ \_ n \).

37. In base seven, \( 41_n \) means \_ seven(s) and \_ one(s).

   And \( 2_n \) means \_ one(s).

38. Then, \( 41_n + 2_n \) means \_ seven(s) and \_ one(s)

   plus \_ one(s).

39. Altogether, then, there are \_ seven(s) and \_ one(s).

40. So \( 41_n + 2_n = \quad \_ \_ \_ \_ \_ \_ n \).
DIVISION BY ZERO—IMPOSSIBLE!
JOAQUIN BUSTOZ, Programmer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 32 frames, $.15.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 3-7.
Prerequisites: “Mastery of basic multiplication and
division facts.”
Average Time: 18.7 minutes (based entirely on data);
standard deviation, 3.3 minutes.
Next Revision: “The program is the final revision.”
(1 sample page)
MISCELLANEOUS ARITHMETIC

DIVISION BY ZERO—IMPOSSIBLE!

1. \[ 4 \times 0 = 0 \]
   
   Any number \( \times 0 = 0 \).

2. \[ 92 \times 0 = 0 \]
   
   Any number \( \times 0 = 0 \).

3. \[ 0 \times 0 = 0 \]
   
   No matter what number we multiply by zero, the answer is always zero.

4. \[ \frac{43}{0} \]
   
   Any number \( \div 0 = \) ___.

5. \[ \frac{43}{0} \]
   
   To check the division \( \frac{43}{0} \) we multiply \( 4 \times 5 = \) ___.

6. \[ \frac{43}{0} \]
   
   We can always check our division by multiplying.

7. \[ \frac{43}{9} \]
   
   To check the division \( \frac{43}{9} \) we multiply \( 9 \times 7 = 63 \).

8. \[ \frac{43}{9} \]
   
   To check the division \( \frac{43}{9} \) we multiply \( 9 \times 9 = 81 \).

9. \[ \frac{43}{9} \]
   
   To check a division we multiply the divisor by the quotient. If the division is correct then the divisor times the quotient equals the dividend. For example, to check the division \( \frac{43}{9} \) we would multiply \( 4 \times 9 = 36 \).

10. \[ \frac{43}{9} \]
    
    If a division is wrong, then the divisor times the quotient does not equal the dividend. For example, in the division \( \frac{43}{9} \), 6 times 9 does not equal 43. So the division is wrong.
MISCELLANEOUS ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: INTRODUCTION TO NUMBERS
LLOYD E. HOMME
DONALD BERTHOLOMEY, Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 615 frames, paperback, 133 pp., 8-1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Final Test included.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Pre-school students ages: 4 years 6 months to 6 years."
Prerequisites: "About 15 minutes of adult assistance at the beginning of the program."
Average Time: 3-6 hours (based entirely on data); standard deviation, .149 hours.
Next Revision: June, 1964.
(1 sample page)
"See the mark at the top? It is a number one. Find the one at the bottom and draw a circle around it."

"This tells you that you were right."

"This is a hand with one finger sticking up. It means for you to find the one at the bottom."

"Were you right?"

"Here is one ball. It means you should pick the number at the bottom that means one."

"What should you do here?"

"Here is a box with one ball. It is marked one (point). Which one at the bottom is just the same?"

"You forget to look at the mark."

"You forget to count the balls."

"That's right. One ball and one mark."
MISCELLANEOUS ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: TIME TELLING
DONALD T. TOSTI
POLO C. DE BACA, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 440 frames, paperback, 97 pp., 8-1/2" x
11", $8.50.
For use in MIN/MAX II machine, $25.00; program re-
usable, $7.50.
Teacher's Manual: General Manual for all TMI-Grolier
programs available.
Final Test included.
Constructed Responses always used; no Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average age 8.4; average school grade 3.4."
Prerequisites: "Minimum vocabulary of 46 words, list
provided."
Average Time: 1-1/2 - 3-1/2 hours (based entirely on
data); standard deviation, .4 hours.
Next Revision: December, 1964.
(1 sample page)
MISCELLANEOUS ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: TIME TELLING
Tosti, De Baca; TEACHING MATERIALS CORPORATION
one sample page:

Which clock says 2:25?

Which clock says 6:40?

The time is 7:00.

The time is 5:15.

The time is 9:30.
MISCELLANEOUS ARITHMETIC
Jr. H.S.

FINITE ARITHMETICS
MILDRED REIGH, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept. all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher's Manual available.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental: 12 eighth grade students drawn from upper half of class. Test: 50 eighth grade students enrolled in general mathematics."
Prerequisites: "Knowledge of arithmetic including fractions."
Average Time: 23 hours (est.).
Next Revision: June, 1963.
(1 sample page)
35. Because of being able to have any one of a variety of numbers for a modulus, we call this whole process "modular arithmetic." If there are 6 numbers in an arithmetic we can say "the modulus is 6" or "this particular arithmetic is modulo 6."

What is the modulus of an arithmetic that has 10 objects in it?

__________________________
Modulo 10 or 10

36. The arithmetic that has a dozen objects in it is ____________________________ 12.

__________________________
modulo

37. The numbers on the dial on a clock face would be modulo ____________________________ 12.

__________________________
38. The days of the week would be modulo ____________________________ 7.

__________________________
39. The months of the year would be modulo ____________________________ 12.
MISCELLANEOUS ARITHMETIC

GENERAL MATHEMATICS 40
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programmed text, 57,160 frames, paperback, 1872 pp.,
5" x 7", available in 52 separate units at $3.75 each.
For use in SPEED machine, program reusable, $520.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available at $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 & $800.
Average Time: 125 hours (est.).
Next Revision:
(1 sample page)
MISCELLANEOUS ARITHMETIC

GENERAL MATHEMATICS 40
Coursey; EDUCATION ENGINEERING
one sample page:

CHANGING A MIXED NUMBER TO AN IMPROPER FRACTION

Suppose an object measured 2 1/2 inches as shown on the scale below.

If we should desire to change this mixed number to an improper fraction, a study of the scale will show that this measurement could also be shown as 5 1/2 inches or 27 inches.

Likewise, the measurement shown instead of being called 3 1/2 inches could be called 3 2 1/2 inches or 5 1/2 inches.

Determine the following measurements as mixed numbers.

Determine the following measurements as improper fractions.

<table>
<thead>
<tr>
<th>mixed numbers</th>
<th>improper fractions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2 1/2</td>
<td>5 1/2</td>
</tr>
<tr>
<td>2. 3 1/2</td>
<td>3 2 1/2</td>
</tr>
<tr>
<td>3. 4 1/2</td>
<td>8 1/2</td>
</tr>
<tr>
<td>4. 5 1/2</td>
<td>10 1/2</td>
</tr>
</tbody>
</table>

ANSWERS

1. 2 1/2
2. 3 1/2
3. 4 1/2
4. 5 1/2

58
MISCELLANEOUS ARITHMETIC

LOWER PRIMARY ARITHMETIC
A Set of 10 Automated Workbooks.
Prepared through the facilities of The Devereux Foundation.
Published by DEVEREUX TEACHING AIDS,
Box.717, Devon, Penna.

Programmed workbooks, 1440 frames, paperback, 7" x 11".
“Available only to special education facilities for
exploratory use. For further information contact
Dr. Henry Platt, Director of Training, The Devereux
Foundation, Devon, Pennsylvania.

For use in DEVEREUX TEACHING AID - MODEL 50,
$89.50, program reusable.
Teacher’s Manual available, $1.00.

Table of Contents.
Unit test(s) available. Coordinated with California Achievement
Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade
schools.
Prerequisites: “Most booklets usable with students exhibiting
specific reading disabilities though this is naturally
not a requirement—neither is ability to write, so
physically handicapped can and do use them.”

Additional material required: DEVEREUX TEACHING AID -
MODEL 50, $89.50. Some developmental material
available for the Graflex Instructor machine.
Average Time: “Dependent on IQ and other factors; IQ of
70 and CA of 16 will usually finish a workbook in an
hour.”

Next Revision: September, 1963.

(1 sample page)
MISCELLANEOUS ARITHMETIC

LOWER PRIMARY ARITHMETIC
The Devergux Foundation; DEVEREUX TEACHING AIDS
one sample page:

PICTURE SYMBOL ASSOCIATION

Turn to number 2

1 to 5

How many?

1
2
3
4
5

60
MISCELLANEOUS ARITHMETIC

NUMBER FACTS
   PART I: Addition & Subtraction; PART II: Multiplication & Division

THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)

Published by: E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 540 frames in each part, paperback,
75 pp. in each part, 5" x 8", $7.85 each part.
“Program fits response device consisting of 15 edge-
punched cards—printed educational matter published
in pamphlet or text form with required student
responses coded to correspond with the response
device—a sorter.”

Teacher’s Manual available, included with program.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
   “Elementary.”
Prerequisites: None
Additional material required: “Response device described
above.”
Average Time: 20 hours (est.).
Next Revision: “Unknown.”
(1 sample page)
MISCELLANEOUS ARITHMETIC

NUMBER FACTS
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS
one sample page:

SAMPLE FRAMES: NUMBER FACTS

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
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<td>14</td>
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<td>88</td>
<td>89</td>
</tr>
<tr>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
<td>98</td>
<td>99</td>
</tr>
</tbody>
</table>

9 + 3 =  □  (A - C)  9 + 1 =  □  (B - D)  9 + 5 =  □  (F - J)
9 + 6 =  □  (F - H)  9 + 9 =  □  (C - R)  9 + 4 =  □  (D - M)
9 + 8 =  □  (A - K)  9 + 2 =  □  (B - L)  9 + 7 =  □  (S - T)
MISCELLANEOUS ARITHMETIC Jr. H.S.

RATIOS & PROPORTIONS
FRANK C. GENTRY, Consultant
EDWARD J. RICKERT, Programer, General Programmed Teaching Corporation
JAMES V. DEVINE, Programer, GPTC
EDNA M. MORGAN, Programer, GPTC
LEWIS PEARSALL, Programer, GPTC
BETTY LOU C. DUBOIS, Editor, GPTC
FRANK C. GENTRY, Consultant

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1344 frames, paperback, 268 pp.,
8-1/2" x 11", §

Teacher’s Manual: “Instructions to teacher included in preface.”

Table of Contents.

Final test available.

Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Elementary students ranging from 5th through 9th grades. Developmental testing in Albuquerque, New Mexico; field testing in Albuquerque, New Mexico; Roanoke, Virginia; Princess Anne, Virginia.”

Prerequisites: “5th-grade reading level; knowledge of arithmetic.”

Average Time: 8 hours (based entirely on data).

Next Revision: 1968.

(1 sample page)
### MISCELLANEOUS ARITHMETIC

#### RATIOS & PROPORTIONS

Gentry, Rickert, Devine, Morgan, Pearsall, Dubois;
ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:

<table>
<thead>
<tr>
<th>97)</th>
<th>3 to 16 can mean 3 divided by 16.</th>
<th>True / False</th>
</tr>
</thead>
<tbody>
<tr>
<td>98)</td>
<td>The symbol : is a colon.</td>
<td>Copy it.</td>
</tr>
<tr>
<td>99)</td>
<td>Circle the colon.</td>
<td></td>
</tr>
<tr>
<td>100)</td>
<td>![Diagram of Set 1: 3 circles, Set 2: 16 circles]</td>
<td>Compare the number of balls in Set 1 to the number in Set 2.</td>
</tr>
<tr>
<td>101)</td>
<td>![Diagram of Set 1: 6 circles, Set 2: 3 circles]</td>
<td>When the number of boxes in Set 2 is compared to the number of boxes in Set 1, do we write 6 to 3? Yes / No</td>
</tr>
<tr>
<td>102)</td>
<td>Make a colon.</td>
<td></td>
</tr>
<tr>
<td>103)</td>
<td>![Diagram of Set 1: 3 circles, Set 2: 16 circles]</td>
<td>Compare Set 1 to Set 2 by division. Use the word to and the + sign.</td>
</tr>
<tr>
<td>104)</td>
<td>When sets are compared by division, the colon sign may be used in place of to or in place of the division sign (+). Which sign can be used to compare sets by division?</td>
<td></td>
</tr>
</tbody>
</table>

---

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MISCELLANEOUS ARITHMETIC

SELF-TEACHING ARITHMETIC BOOKS
Knowledge Master Books
JOHN W. STUDEBAKER
GORDON STUDEBAKER, both of Scholastic Magazines, Inc.
Published by SCHOLASTIC MAGAZINES, Inc.
50 West 44th Street, New York 36, New York.

Programed text, 350 frames, hardcover, 72 pp., 9" x 12",
$4.95 (single copy), $3.95 (classroom quantity).
Teacher's Manual available, $.25.
Table of Contents.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Tested in 40 elementary classrooms in Iowa."
Prerequisites: None
Additional material required: "Magic slate" .10 each.
Average Time: 3 hours (est.).
Next Revision:
(1 sample page)
MISCELLANEOUS ARITHMETIC

SELF-TEACHING ARITHMETIC BOOKS
Studebaker; Studebaker; SCHOLASTIC MAGAZINES
one sample page:

LESSON 3

WHAT TO DO: 1. Look at the facts on this page. The little red numbers in the windows are the right answers. Study the facts and the answers.
2. Then put a piece of paper or a Magic Slate under this page. Write your answers under the facts, through the windows.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>+2</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-3</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>+2</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-4</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>+4</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-3</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>+3</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Now check your work. Put your paper or Magic Slate under page G. See if your answers are the same as the little red numbers in the windows.

NOTE: The blue numbers outside the boxes have nothing to do with the facts on this page.
MISCELLANEOUS ARITHMETIC

UPPER PRIMARY ARITHMETIC
A Set of 13 Automated Workbooks
Prepared through the facilities of the DEVEREUX FOUNDATION.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 1872 frames, paperback, 7" x 11".
Available only to special education facilities for exploratory use. For further information contact
Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.
For use with the DEVEREUX TEACHING AID - MODEL 50,
$89.50; program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available. Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.50. Some developmental material available on the Graflex Instructor machine.
Average Time: "Dependent on IQ and nature of limitations.
Many students go through the book in one hour, but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)
### Coins and Making Change

**25 cents could be**
- 1 nickel
- 1 dime
- 1 quarter

**25 cents could be**
- 1 dime and 5 pennies
- 2 dimes and 2 pennies
- 2 dimes and 5 pennies

**25 cents could be**
- 1 nickel and 5 pennies
- 2 nickel and 5 pennies
- 2 nickel and 1 dime

**25 cents could be**
- 1 nickel and 15 pennies
- 2 nickel and 15 pennies
- 2 nickel and 25 pennies
MISCELLANEOUS' ARITHMETIC. Jr. H.S.

WHOLE NUMBERS AND NUMERALS
JAMES A. SMITH, Britannica Center for Studies in Learning
Published by: ENCYCLOPAEDIA BRITANNICA PRESS, 425 North Michigan Avenue, Chicago 11, Illinois

Programmed text, 2,397 frames, paperback, 370 pp., 8 1/2" x 11 1/2"; $9.75. Bound in 2 separate volumes.
For use in TEMAC BINDER, $1.25; program reusable, $8.50
Teacher's Manual available, $1.25
Table of Contents
"Sample tests available, non-normed, included in Teacher's Manual."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Individual students at Britannica Center, Palo Alto, Calif. Classroom use and final testing at Roanoke City Schools."
Other using population(s): "Any persons reviewing the field of modern mathematics for the first time."
Prerequisites: None
Average Time: 45-50 classroom hours (est.).
No Revision.
(1 sample page)
MISCELLANEOUS ARITHMETIC

WHOLE NUMBERS AND NUMERALS

Smith; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:

17. In other ancient countries, people wrote

for whole numbers in still other ways. That is, they used a system of

numeration which was different from the Roman system.

18. We will learn to write Roman numera-

such as I, II, V, X.

19. Although we use the Roman system of numeration,

we do not use their system of numeration. When we do problems in

arithmetic, we have a much easier system of

numeration.

20. We do not ordinarily use the Roman system of

but use a much easier system of

numeration of our own.

21. When we use our system of numeration, we write numerals

like 0, 1, 2, 3, 4 to represent numbers.

22. Our numerals are quite different from those used by the Romans.

That is, they used their Roman numerals of numeration

while we use a different system of

numeration.

23. Both their system and our system are called systems of

numeration because any system for writing numerals for numbers

is called a system of

numeration.

24. Our system is a very easy one. We start with the two numerals 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and can

form a numeral for any whole number by using these.

25. We will always refer to each of these numerals 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 as a digit. We will speak of the digit 3 as the digit 3.

We also refer to 7 as a

digit.

WHOLE NUMBERS AND NUMERALS
ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: MULTIPLICATION & DIVISION FACTS (1 through 100)
JAMES L. EVANS
DONALD T. TOSTI, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.

Programed text, 2,099 frames, paperback, 441 pp., 8-1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program reusable; $10.00.
Final Test included.
- Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
- "8 year olds in 3rd grade. IQ range 96-116."
Prerequisites: "Third grade reading ability and knowledge of addition and subtraction are required."
Average Time: 25-30 hours (based entirely on data); standard deviation, 9.62 hours.
(2 sample pages)
ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: MULTIPLICATION & DIVISION FACTS
Evans, Tosti; TEACHING MATERIALS CORPORATION
2 sample pages:

<table>
<thead>
<tr>
<th>Page</th>
<th>Content</th>
</tr>
</thead>
</table>
| 21   | Let's count by 6's.
| 36   | Count by 6's 7 times and get 42.
| 22   | How many 6's are in 42?
| 42   | 42 + 6 = ( )

<table>
<thead>
<tr>
<th>36</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td></td>
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<td>23</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Example:

- Count by 6's 7 times to get 42.
- How many 6's are in 42?
- 42 + 6 = ( )
- 5 + 5 + 5 + 5 + 5 = 25
- 5 + 5 = ( )
1. There are 4 balls, each group has 4 equal groups.

2. 6 balls can be divided into 3 equal groups.

3. 6 balls have been divided into 2 equal groups. There are 4 balls in each group.

4. 6 cats divided into 2's give equal groups of cats.
ARITHMETIC

FOUNDATIONS OF MULTIPLICATION & DIVISION
JEROME WHITE, Programer, General Programmed
Teaching Corporation
JACOB REGER, Programer, GPTC
SHIRLEY BITTERLICH, Programer, GPTC
BETTY LOU DUBOIS, Editor, GPTC
ARTHUR STEGER, Consultant
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 360 pp.,
8-1/2" x 11", $...
Teacher's Manual: "Instructions to teacher included in
preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 3rd and 4th grade students.
Field testing: 3rd grade students."
Prerequisites: None.
Average Time: 20 hours (est.).
Next Revision: 1968.
(1 sample page)
ARITHMETIC

FOUNDATIONS OF MULTIPLICATION & DIVISION
White, Reger, Bitterlich, Dubois, Steger; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the arrays have the same number of elements in all?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circle the array with the same number of rows as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circle the array with the same number of elements in each row as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circle the array with the same number of elements in all as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many rows does each array have?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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ARITHMETIC

MULTIPLICATION BOX
Developing Automated Response to Multiplication Facts
JEROME BINDER, Reading Consultant and
JOSEPH MILLMAN, Supervisor of Instruction, B-M Educational Productions
Published by B-M EDUCATIONAL PRODUCTIONS,
132 Lexington Street, Westbury, New York

Program available on 50 cards, 5" x 8", boxed, $14.95.
"Multiplication Box consists of 39 plastic cards with
11 pre-tests."
Teacher's Manual included.
Table of Contents.
Final test included.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developed with two students. Developed and revised
with 10 students. Tested on student population of city
schools and suburban schools."
Other using population(s): "Used remediation technique,
based on students needs."
Prerequisites: "Teacher development of multiplication
facts."
Average Time: "2 minutes each unit—78 units selective
program based upon individual needs." (est.).
Next Revision: June, 1963.
(1 sample page)
DIRECTIONS FOR STUDENTS
Read each part carefully. Fill in all of the blank spaces. After you have filled in the answer, look at the right side of the card. If your answer is not the same as the answer that is given, change your answer and go on to the next part.

1.
Place eight dots in each box.
The total number of dots are 48.

2.
You could say that...
Six boxes with eight candies in each box are equal to 48 candies.

3.
Six boxes with _______ candies in each box are equal to 48 candies.

4.
48 candies are equal to six boxes with _______ candies in each box.

5.
etc.
ARITHMETIC

MULTIPLICATION AND DIVISION

A Set of 9 Automated Workbooks
Prepared through the facilities of THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

Programed workbooks; 1296 frames, paperback, 18 pp.
each book, 7" x 11". “Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.”

For use in DEVEREUX TEACHING AID - MODEL 50 machine, $89.50, program reusable.
Teacher’s Manual available, $1.00.
Table of Contents.
Unit Test(s) available. Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: “Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them.”

Additional material required: Devereux Teaching Aid - Model 50, $89.50. Some developmental material available on the Graflex Instructor machine.
Average Time: “Depends on IQ and nature of limitations.
Many students go through the book in one hour but require several repetitions on subsequent days.”

Next Revision: September, 1963.
(1 sample page)
# ARITHMETIC

**MULTIPLICATION AND DIVISION**  
Devereux Foundation; DEVEREUX TEACHING AIDS

one sample page:

<table>
<thead>
<tr>
<th>UNDERSTANDING MULTIPLICATION</th>
<th>Turn to number 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book 1</td>
<td></td>
</tr>
</tbody>
</table>

| To increase is to make larger. When we **multiply**, we **increase** the amount. | The **shorter way to increase an amount by multiples is to increase**. |
| decrease                      | multiply         |
| subtract                      | add              |
| increase                      | subtract         |

Increasing the number by the same amount more than once is to **multiply**.  

| subtract                        | divide          |
| add                            | multiply        |

Multiplying is increasing a number by the same amount more than once.  

| adding number                   | subtracting number |
| add two                        | add three        |

You can add a column of the same sized amounts and get a correct answer. It is **shorter** if you subtract.  

| subtract                        | multiply         |
| add                            | divide           |

692-898 O-63-7 79
BUSINESS EDUCATION & ECONOMICS

THE ACCOUNTING PROCESS
A Programmed Text
GERALD O. WENTHWORTH
A. THOMPSON MONTGOMERY
JAMES A. GOWEN
THOMAS W. HARRELL, all of Stanford School of Business.
Published by: McGRAW-HILL BOOK CO., Inc.,
330 West 42nd Street, New York City.

Programmed text, 1205 frames, hard and papercover, 225 pp.,
6" x 9", $__. For use in Koncept-O-Graph, $39.00, program reusable, $9.95.
Table of Contents, Indexed Glossary.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Original version tested by IBM. Subsequent version
in various representative universities."
Prerequisites: High school education or equivalent.
Additional equipment required: Scratch paper & pencil only.
Average Time: 20 hours (est.).
Next Revision: 1965.
(1 sample page)
In order to be meaningful, the dollar amounts listed on the Balance Sheet and the Income Statement are classified by accounts. When you refer to these outputs, you will see such classifications as Cash, Inventory, Sales, and Cost of Goods Sold. These classifications are called accounts.

Cash and Inventory are examples of accounts shown on the Balance Sheet. Sales and Cost of Goods Sold are examples of accounts shown on the Income Statement.

The total amount remaining in any account is called the balance. For instance, the dollar amount listed after Cash on the Balance Sheet is the balance in the Cash account.

The dollar amounts are listed on the Balance Sheet and the Income Statement according to meaningful classifications called accounts.

The total amount in any account listed on the Balance Sheet or the Income Statement is called the balance of that account.

For instance, if you saw on the Balance Sheet the listing “Cash .......... $2,000,” you would know that the Cash account had a balance of $2,000.

If you saw the listing “Inventory .......... $5,000,” you would know that the Inventory account had a balance of $5,000.
PRINCIPLES OF ACCOUNTING
WILLIAM VENTOLO, Associated Programed Learning, Inc.
Published by EDUCATIONAL METHODS, Inc.,
612 North Michigan Avenue, Chicago, Illinois.

Programed text, 5,000 frames, paperback, 800 pp.,
7" x 10", available in about 5 separate volumes,
$2.50-$5.00 each; all five volumes $12.00-$25.00.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: None.
Average Time: 50-60 hours (est.).
Next Revision: September, 1963.
(3 sample pages)
PRINCIPLES OF ACCOUNTING
Ventolo; EDUCATIONAL METHODS
3 sample pages:

230. Double-entry bookkeeping requires a ___ and ___ entry for each transaction.

231. Must the debit and credit amounts of each transaction be equal?

232. The basic principle of double-entry bookkeeping is the principle of balance. Double-entry means that at least two entries are made in recording each transaction. This system ensures one entry to ___ against the other.

233. An inflow of assets other than from owners of a business is called ___.

234. Income has the effect of increasing stockholders' equity and would, therefore, be credited to ___.

235. Income accounts are called ___ for a business.

236. Stockholders' equity account: Income account: Increase

An increase in the stockholders' equity is entered on the credit side of the account. Since income has the effect of increasing the stockholders' equity, an increase in an income account is also entered on the ___ side of the account.

237. Income has the effect of ___ (increasing/decreasing) the stockholders' equity.
238. Since income (temporary stockholders' equity) accounts will contain entries that really represent increases in stockholders' equity, an increase in an income account will be entered on the side of the account.

239. Transaction: Cash is received for services rendered to a customer.

The debit and credit involved are as follows.

Debit credit

Cash: Service Income.

240. Transaction: Cash is received for services rendered to a customer, $2000.

Prepare simple T-accounts and make the entries.

The accounts involved are Cash and Service Income.

241. An outflow of cash, other than to owners of a business, is called an expense.

Thus, if salaries are paid to employees, an expense is incurred by the business.

242. Expenses have the effect of reducing stockholders' equity and could, therefore, be debited to retained earnings. Instead, a separate account is provided for each kind of expense. Such expense accounts, like income accounts, are called temporary stockholders' equity accounts.

243. Income and expense accounts are called temporary stockholders' equity accounts.

244. Income has the effect of increasing the stockholders' equity, and expenses have the effect of decreasing the stockholders' equity.

245. Since an increase in an expense is really a decrease in stockholders' equity, an increase in an expense account is always entered on the side of the account.
266. Transaction: Salaries are paid in cash.

The debit and credit involved are as follows.

Salaries Expense; Cash.

267. Transaction: Salaries are paid in cash, $1000.

Prepare simple T-accounts and make the entries. The accounts involved are Cash and Salaries Expense.

268. Since income accounts have an increasing effect, and expense accounts have a decreasing effect on the shareholders' equity, the balance sheet, assets + liabilities + shareholders' equity, can be expanded in this manner:

\[ A = L + SE + I - E \]

269. If we put the expanded balance sheet equation in T-account form, showing increases (+) and decreases (-) on the proper debit and credit sides, it would look like this:

By carefully observing this equation, we can see that debit indicates an increase or a decrease in the following accounts.

<table>
<thead>
<tr>
<th>Account</th>
<th>Debit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Asset</td>
<td>Increase</td>
</tr>
<tr>
<td>2) Liability</td>
<td></td>
</tr>
<tr>
<td>3) Decrease</td>
<td></td>
</tr>
<tr>
<td>4) Decrease</td>
<td></td>
</tr>
<tr>
<td>5) Decrease</td>
<td></td>
</tr>
<tr>
<td>6) Stockholders' equity</td>
<td></td>
</tr>
<tr>
<td>7) Income</td>
<td></td>
</tr>
<tr>
<td>8) Expense</td>
<td></td>
</tr>
</tbody>
</table>
BANK TELLER TRAINING COURSE
RICHARD MORRIS
Published by EDUCATIONAL METHODS, INC.,
612 North Michigan Avenue, Chicago, Illinois.

Programed text, 750 frames, binder, 300 pp., 8 1/2" x 11", $____, available in 5 separate units.
Separate answer sheets available.
Table of Contents, Index.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"50 bank tellers and trainees in 8 banks across the country."
Prerequisites:
Average time: 6 hours (est.).
Next revision: "April, 1963."
(1 sample page)
14. When June Oates wrote and signed the check below, it became the property of Olive Ranson. If now Miss Ranson wishes her friend, Polly Jordan, to have the $15.50, she may transfer ownership or title to the check to Miss Jordan. She does this by endorsing it on the back with the words, "Pay to the order of Polly Jordan," and signing her name. Do this on the back of the check at left below.

<table>
<thead>
<tr>
<th>Pay to the order of Polly Jordan:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olive Ranson</td>
</tr>
<tr>
<td>Feb. 22, 1962</td>
</tr>
<tr>
<td>Fifteen and 50/100 Dollars</td>
</tr>
<tr>
<td>Jan.</td>
</tr>
</tbody>
</table>

15. We note that the endorsement in the preceding item transfers ownership or title to the check from Olive Ranson to Polly Jordan. This illustrates a third function of an endorsement to transfer title to the check.

A13 transferred

16. Thus, we have now studied three functions of an endorsement on a check:
   a) to guarantee the legal ownership of the check;
   b) to guarantee the previous endorsement on the back of the check; and
   c) to transfer ownership or title to the check.

A16 guarantee
   endorsement
   transfer

Please go on to the next page

Copyright 1963 Educational Methods, Inc.
612 North Michigan Avenue, Chicago, Ill.
BEGINNING BOOKKEEPING
FREDERICK G. COMSTOCK, Subject Matter Expert
ROBERT M. CHAPLIN, Programer, General Programmed Teaching Corporation
ANNE BEACH, Editor, General Programed Teaching Corporation

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2010 frames, paperback, 456 pp.,
8-1/2" x 11", $\ldots$

Teacher’s Manual: “Instructions to teacher included in preface.”

Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental testing: High school students.
Field testing: High school students.”

Prerequisites: None.
Average Time: 28 hours (est.).
Next Revision: 1968.
(2 sample pages)
When completed, the total of column 3 and the total of column 4 on the worksheet must be equal.

If the number of accounts credited exceed the number debited, then the totals of column 3 and 4 cannot be equal.

When an adjustment must be made to an account whose title and number do not already appear on the worksheet, the title and number of the account to be adjusted are entered on the line following account numbers and titles already listed. If the account is adjusted anyway, the account must be omitted from the worksheet.

Any error in the adjustments must be corrected before the bookkeeper can proceed. If the totals of column 3 and 4 are not equal, this indicates an error that must be located and corrected.

To locate an error, recheck the column totals. If this does not eliminate the error, each adjustment must be rechecked to ensure that debit and credit amounts are equal and that they have been placed in the proper worksheet columns.

Completing adjustments for previously unrecorded income and expense items results in a more accurate picture of financial transactions of the accounting period.
What is the heading of columns 5 and 6 on the worksheet illustrated in Figure 25?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td>(6)</td>
</tr>
</tbody>
</table>

Worksheet columns 5 and 6 consist of an adjusted ___________

To complete the adjusted trial balance, the bookkeeper combines the amounts entered on the same lines in columns 1, 2, 3, and 4 and extends them to columns 5 and 6, the Adjusted ____________ columns.

Amounts in the Adjusted Trial Balance columns represent balances in the accounts _____ the adjustments for accrued and deferred items have been made.

| before | after |

If an account having a debit balance in column 1 on the worksheet is adjusted with a debit in column 3, the amounts are _________ when the balance is extended to column 5.

| added | subtracted |
BUSINESS EDUCATION & ECONOMICS

BUSINESS LAW
JOHN R. FONSECA, Director of Educational Programs,
Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc.,
Seneca Turnpike, New Hartford, N. Y.

Programmed text, 6500 frames, paperback, 800 pp., 8 1/2” x
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“College students and high school students.”
Prerequisites: None.
Average time: 60-75 hours (est.).
Next Revision:
[1 sample page]
## Business Law

### Requirements of Negotiability

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Negotiable Instruments Law sets forth the definition and requirements of negotiability. In order to understand these requirements, one must learn the</td>
<td>2. The two main instruments referred to in the Negotiable Instruments Law are checks and promissory notes. We are then to discuss primarily the definition and requirements of the negotiability of   and</td>
</tr>
<tr>
<td>2. Checks, promissory notes</td>
<td>3. In general, the term &quot;negotiable&quot; refers to the quality of checks and promissory notes that makes them transferable from one person to another. When checks and promissory notes are transferable from one person to another, they are termed to be   instruments.</td>
</tr>
<tr>
<td>3. Negotiable Instruments</td>
<td>4. There are certain exact requirements that must be met before an instrument can be negotiable. These requirements are set forth in the   Law.</td>
</tr>
<tr>
<td>4. Negotiable Instruments</td>
<td>5. We see then that the Negotiable Instruments Law (N.I.L.) outlines the necessary requirements that negotiable instruments such as   and   must have before they can be transferred or</td>
</tr>
</tbody>
</table>

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92
Part I, Student Workbook to Accompany CHALLENGE TO THE AMERICAN ECONOMY
RENDIGS FELS, Department of Economics, Vanderbilt University
DENNIS STARLEAF, Instructor, Vanderbilt University
MARJORIE CHURCHILL
Published by ALLYN AND BACON, Inc.,
150 Tremont Street, Boston 11, Massachusetts

Programmed workbook, 299 frames, paperback, 116 programmed pp. (286 pp. total), 8-1/2" x 11", $3.95.

Table of Contents.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Tested on approximately 200 students at Vanderbilt University under the directorship of Rendigs Fels."
Prerequisites: None.
Average Time: 4 hours (est.).
Next Revision: "Unknown."

(1 sample page)
CHALLENGE TO THE AMERICAN ECONOMY
Fels, Starleaf, Churchill; ALLYN AND BACON
one sample page:
BUSINESS EDUCATION & ECONOMICS

CONDUCTING AN INTERVIEW
(Number Five in the Management Skills Series)
WILLIAM PAUL
SCOTT B. PARRY, both of Scott B. Parry & Associates
Published by LORD PRODUCTS INC.,
28 West 22nd Street, New York 10, N.Y.

Programed text, 300 frames, paperback, 155 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION:
"College undergraduates, male and female."
Prerequisites: High school verbal ability.
Average Time: 4 hours (est.).
Next Revision: "Unknown."
(1 sample page)
CONDUCTING AN INTERVIEW

Paul, Parry; LORD PRODUCTS

one sample page:

1. Interviewing, like all communication skills, is a two-way process involving at least ______ persons (and usually two or more).  

| two |

2. In most forms of communication, these two parties are known as sender and ______.  

| receiver |

3. In interviewing, however, the two parties are known as ______ and ______. As you can gather from the title, this booklet puts you in the shoes of the ______.  

| interviewer |

4. "Interviewing" is another word for ______, the term we shall use throughout this program.  

| respondent |

5. Whether the person whom you interview is seeking employment, receiving an on-the-job evaluation, or being polled for his opinion, we'll still refer to him as the ______ and to you as the ______.  

| respondent interviewer |

6. Recall that the communication process is a two-way process. This means that as interviewer you are (a) a sender of information (b) a receiver of information (c) both (a) and (b)  

| (c) |

7. As an interviewer, you have information to convey to ______. Similarly, the ______ has information to receive.  

| receive | (cat) | respondent | convey | (give) |

8. The techniques you employ in the interview situation will, of course, depend on the purpose of the interview. For example, screening of credentials and references, for example, would apply only to an (a) applicant seeking a job with your company (b) old employee receiving an annual evaluation  

| (a) |

9. There are, of course, basic principles of good interviewing that apply in every type of interview situation. Let's examine some of these before turning to specific techniques that depend upon the purpose of the interview.  

| basic principles | purpose | (nature) |

10. First, there is the matter of objectives. It is not always self-evident to both the ______ and the ______ what the ______ of the interview are.  

| respondent | interviewer | (either order) | objectives |
CONSUMER FINANCE

Credit Judgment
MARSHALL ARKY, et al., Roto Vue
Published by MODEL PUBLISHING Company,
1602-08 Hodiamont St., St. Louis, Missouri

Programmed text, 800 frames, paperback, 150 pp., 8 1/2"x11",
available in 3 separate units at $5.00 each.
Answer Sheets included.
Unit and Diagnostic Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Employees in eight branch offices for development.
Controlled field test involving over fifty employees in three dozen offices of nationwide finance company."
Prerequisites: High school graduate.
Average Time: 7 hours (est.).
Next Revision: June, 1963.
(1 sample page)
91. Three facts tell us whether the person is able to pay. One of
these is his Net Income, another is his Total Indebtedness,
and the third is his Monthly Expenses. Whether or not a person
is able to pay can be determined by analyzing his total indebt-
edness, his monthly expenses and his net:

92. A person's total indebtedness and fixed expenses are only
important when judged in the light of his net income. You must
determine if the applicant's net income is large enough to
make payments on a new loan, in addition to all of his present
obligations and fixed expenses. A person can have good pay-
ing ability for a new loan only if his net income is large
even to handle all of his present debts and fixed:

93. The ability to pay is determined by examining the applicant's
total indebtedness and fixed monthly expenses in relation to
his net income. A person's total indebtedness and fixed
monthly expenses are important only when judged in relation
to his net monthly income:

94. A person whose present installment payments total $200,
whose food, rent, and clothing cost approximately $300 a
month, and whose monthly net income is $600, should have a
balance of $100 with which he could make payments on a new
loan. An applicant who has monthly installment payments of
$100, fixed monthly expenses of $300, and a net monthly
income of $400 (should, or should not) be
able to handle payments on a new loan.

95. Net income includes, of course, income from all sources in
addition to an applicant's salary. His wife may be employed,
or he may receive rent from property he owns. Such income
must be added to his salary to find the net income. Net
income includes all of any income in addition to the
applicant's: 
CUTTING OFFICE COSTS THROUGH WORK SIMPLIFICATION
(Number Four in the Management Skills Series)
ELMER V. GRILLO, New York University; Staff Assistant, Metropolitan Life Insurance Co.
Published by LORD PRODUCTS, Inc.,
28 West 22nd Street, New York 10, N.Y.

Programed text, 320 frames, paperback, 165 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATIONS(S):
"Employees in two national business organizations."
Prerequisites: High school graduate.
Average Time: 3-1/2 hours (est.).
Next Revision: "Unknown."
(1 sample page)
1. Mark Twain once said that there are two times in a man’s life when he should not speculate: first, when he can’t afford it, and second, when he can afford it! Brilliantly Mark Twain didn’t believe in speculation.

2. Another word for speculation is _________. In the business world today, no one can afford to speculate about costs when it is possible to get actual facts and figures.

3. If you are a busy office supervisor, your most precious commodity is probably time - your own and that of your workforce. This program should help you answer these questions: where does the ____ go, and what do we get for it?

4. Everything worth doing costs something - in time, money, or effort. We do not begrudge costs that “pay off.” We call these productive costs because they ________ the things we want or need.

5. But we do begrudge in spending time, money, or effort on things that are unnecessary, things that do not fill a need. These costs are not ________, they SHOULD BE ________.

6. For instance, your workforce probably uses a battery of machines: typewriters, calculators, and duplicating equipment, to name a few. You can figure the cost of an idle employee, but let’s not overlook the cost of an ________.

7. If you work in a typical business office, you are regularly faced with mountains of paperwork. Have you ever sat down to figure out the actual time spent in filling out forms and writing reports? (not amount)

8. This program will suggest ways to make reliable estimates of time and money spent on various office operations. By simplifying or eliminating unnecessary, unnecessary, you should be able to reduce or completely ________ your non-productive costs.

9. If you haven’t already gathered from the title, this program is a brief course on cutting non-productive office ________ and simplifying work.

10. Very well, where do we start? Cost reduction in the office starts with a state of mind. Like the first line of an old popular song, “You’ve got to accentuate the positive.” You’ve got to adopt an attitude which will:
(a) stop defending all your present practices
(b) consider other ways of doing the work
(c) be willing to question the obvious
(d) be ready to criticize your own pet ideas
(e) all of the above

100
EFFECTIVE EXECUTIVE PRACTICES
NEELEY D. GARDNER, Deputy Director of Water Resources in Calif.
Published by: DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York City.

Programed text, 354 frames, 362 pp., hard cover,
8 1/4” x 5 3/8”, $4.95.
(A similar program, A SHORT COURSE IN EFFECTIVE EXECUTIVE PRACTICES, is available in TM format from: EDUCATIONAL SCIENCE DIV., U.S. INDUSTRIES, Inc., 250 Park Avenue, New York City.

For use in AUTOTUTOR MARK II, $1,250; program reusable, $95.00.)
Teacher’s Manual available, free, for machine program.
Table of Contents, both programs; Index, programed text.
Unit Test(s) available, machine program.
No Constructed Responses, Multiple Choice Responses and Branching always used.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“California state administrators at middle and upper supervisory levels; middle and upper management, various defense firms.”
Prerequisite: “High school education; some management experience.”
Average Time: 5-7 hours (est.), programed text; 3-6 hours (est.), machine.
Next Revision: Undetermined.
(1 sample page)
YOUR ANSWER: The best approach to regular communication with subordinates is to hold staff meetings regularly, even when the entire group cannot be present. See people individually at times.

By all means, this is the thing to do. Staff meetings are an excellent vehicle for communications and control. Some business is conducted better in a group. Staff meetings avoid some of the meetings that otherwise would be necessary on an individual basis.

Group meetings should be used when common purposes and objectives make them worthwhile. Individual talks should be held when the business at hand applies to one or two people.

All managers should receive formal training in conference leadership. Executives who lead conferences "by ear" often are not able to detect the sour notes.

Now, here's another problem. How about that mountain of paper in your "IN basket." What is the most effective action you can take here? Choose the best answer.

At the beginning of each day, sort everything into "urgent," "important," and "do later" piles. Decide which urgent matters can be acted upon. Then go to work on them.

Sit down with your secretary and take care of all dictation. Handle other "IN basket" material when you have time.

Follow this rule: Handle only once any letter, document, report, or other piece of paper that you find in your "IN basket."
BUSINESS EDUCATION & ECONOMICS

FUNDAMENTALS OF FINANCE AND INVESTMENT
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn Street, Cambridge 38, Mass.

For use in SELF-TUTOR machine, program reusable,
3000 frames, $30.00 (machine and program)
Teacher's Manual available, free.
Table of Contents.
Unit Test(s) available, free.
Constructed Responses usually used; some Multiple
Choice; no Branching,

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Potential applicants for the National Association of
Securities Dealers qualifying examination were used
as subjects. Approximately 15 were used as subjects.
Testing was administered with cheat-proof teaching
machines under supervised conditions. The program
was revised until terminal behavior questions could
be answered correctly and until a negligible error
rate was achieved. Program is accompanied by a set
of 600 terminal behavior questions which may be used
to evaluate the program and to assess student progress."

Prerequisites: None.
Average Time: 30 hours (est.).
Next Revision: "None planned at present."
(3 sample pages)
**Excerpt from**

**Section A: CORPORATE FINANCE I**

--- EXHIBIT A-1 ---

$1.00 OF WORKING CAPITAL CIRCULATING THROUGH WIDGET COMPANY

<table>
<thead>
<tr>
<th>$1.00</th>
<th>$.50</th>
<th>$1.20</th>
<th>$.20 (profit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(working capital)</td>
<td>(for materials and wages)</td>
<td>(selling price)</td>
<td>(working capital)</td>
</tr>
</tbody>
</table>

A7. Mr. Edison needs working capital — the capital needed day by day, week by week, to keep his plant working until he is paid for the widgets he is making. Working capital is money needed to buy ... (a new factory/a swimming pool for Mr. Edison's wife: materials and pay wages).

A8. Exhibit A-1 shows the circulation of $1 of working capital through Widget Co. 50¢ is spent on _________ and 50¢ on _________ to make a widget. The $1 of working capital ... (is/is not) used up to make a widget.

A9. The widget made with this $1.00 of working capital sells for $________. Widget Co. ... (has/does not have) its $1.00 of working capital back now, plus a 20¢ profit.
Exhibit I-2 consists of reports of transactions as they would be printed on the tape. The price at which a security sold is printed in points ... (above/below) the coded name of the security.

In Exhibit I-2 (a), GM means General Motors common stock. At what price did General Motors common trade as reported in Exhibit I-2 (a)? (answer in points)

Only round lot transaction are reported on the tape. Odd lot transactions ... (are/are not) reported on the ticker tape.
<table>
<thead>
<tr>
<th>P107. An investment company may be described in terms of its investment purpose, as well as in terms of the class of securities in its portfolio. That is, funds... (vary/are the same) in what they try to accomplish for their investors.</th>
<th>vary</th>
</tr>
</thead>
<tbody>
<tr>
<td>P108. An investment company generally invests its capital to seek either capital appreciation or for current income.</td>
<td>(No Answer Required)</td>
</tr>
<tr>
<td>P109. A fund which hopes to produce high... (current income/capital appreciation) for its investors would invest in high-yielding securities, whether these are bonds, preferred stocks, or common stocks.</td>
<td>current income</td>
</tr>
<tr>
<td>P110. The high-yielding securities in the portfolio of an &quot;income fund&quot;... (must/need not) be common stocks.</td>
<td>need not</td>
</tr>
<tr>
<td>P111. An income fund would probably invest in... (high-yielding/low-yielding) securities.</td>
<td>high-yielding</td>
</tr>
</tbody>
</table>
IMPROVING YOUR WRITTEN COMMUNICATIONS
(Number one in the Management Skills Series)
SCOTT B. PARRY, President, Scott B. Parry & Associates
Published by LORD PRODUCTS, Inc.
28 West 22nd Street, New York 10, N. Y.

Programed text, 310 frames, paperback, 160 pp., 4" x 11", $6.95.
Table of Contents.
Final test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Employees of three selected industries, faculty members of leading college offering communications program of study, students of same."

Prerequisites: High school equivalency in verbal ability.
Average Time: 4-1/2 hours (based entirely on data); standard deviation "not calculated, since range was too limited to warrant."
Next Revision: "Unknown."

(1 sample page)
### IMPROVING YOUR WRITTEN COMMUNICATIONS
Parry; LORD PRODUCTS
one sample page:

| 140. Our third guidepost to better writing is clarity. Consider two messages. One reads on and on. The other is direct, to the point, enunciates. The same message is (less/more) likely to be boring; it is also (less/more) likely to be misunderstood. |
|---|---|
| 149. A boring message loses the reader's interest, and a misunderstood message fails to get the desired action. You can avoid both these dangers by keeping your message direct and to the point, or |
| 150. The two main reasons for keeping your written message concise, then, are that brevity minimizes the chance that your reader will become bored or will misunderstand (interpret) the message. |
| 151. "Friends, we have in our midst a man who needs no introduction...a man who is near and dear to each and every one of us...you are all, I'm sure, as anxious to hear him as I am, and so, without further comment from me, let me say that it is indeed a rare privilege and honor for me to present your friend and mine, Bill Jones." (applause) |
| Have you ever suffered through a speech introduction that went something like the above? |
| (yes or no) |
| 152. What was the speaker's word? Words. "Fatty" words with little if any message. So let's kill the fat! "Friends, our speaker is known to all of you. He needs no introduction — and so he gets none! Let's welcome to the platform Bill Jones." |
| One way to get the message is to |
| 153. Here's another way to keep your message concise: use plenty of periods. You've noticed how the extemporaneous speaker often resonates so until his sentences crumble under their own weight. Long, gawky sentences are more common to (writers) than to speakers. |
| 154. This is important to remember when you are dictating a letter. Although you are speaking the letter to a secretary, it will be received and read in writing. Keep those sentences short. Don't ramble. Remember this pithy point: pepper your paragraphs with |
| 155. Another secret to conciseness is word length: use the shorter word when there is a choice. For example, don't say "it is our intention to utilize our own manpower on the job" when you can express the same idea by saying, "so ___ to ___ our ___ on the job." |

---

108
INCREASING PRODUCTIVITY THROUGH THE SUPERVISOR
(Numero Three in the Management Skills Series)
M. BERNSTEIN, Senior Programer, Scott B. Parry &
Associates
Published by LORD PRODUCTS, Inc.
28 West 22nd Street, New York 10, N.Y.

Programed text, 300 frames, paperback, 155 pp., 4" x 11";
$6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Not yet field tested, (college males for development)."
Prerequisites: High school verbal ability.
Average Time: 4-1/2 hours (est.).
Next Revision: "Unknown."
(1 sample page)
BUSINESS EDUCATION & ECONOMICS

INCREASING PRODUCTIVITY THROUGH THE SUPERVISOR

Bernstein; LORD PRODUCTS

one sample page:

101. Of the five job simplification techniques we have now reviewed, PROCESS ANALYSIS is by far the most useful. It...up the wasted operations...process and then generates ideas for improving the process as a whole.

<table>
<thead>
<tr>
<th>process</th>
<th>before</th>
</tr>
</thead>
</table>

102. Operations that can simply be eliminated do not need further study. The supervisor will save time and effort; therefore, if he analyses a process (before/after) he analyzes the individual operations that enter into it.

<table>
<thead>
<tr>
<th>repeated</th>
<th>material</th>
</tr>
</thead>
</table>

103. Process, here, means an oft-repeated cycle of operations involved in making a product or providing a service. Its importance lies in the fact that it is not a one-time activity but is many times in a day or week.

<table>
<thead>
<tr>
<th>operations analysis</th>
<th>elements symbol</th>
</tr>
</thead>
</table>

104. The useless motion in a production process can cost thousands of unnecessary dollars a year. Consider the supervisor who discovers a way to cut off from the cost of a process repeated 100 times a day. He has saved his company $_______ a week, or about $_______ a year.

| $50 | $500 |

105. Experienced managers often focus on process analysis on some particular material that enters the department for processing. The process studied, then, is the total of all operations performed on that particular material.

| 106. A process can be thought of as one large, unified operation made up of many separate, smaller operations. The supervisor must observe and evaluate all these when he makes his process analysis.

107. As you learned earlier in this program, all production work can be broken down into six kinds or classes of activity (including non-activity). These classes were called work elements, and you were given the shorthand or by which each one is usually designated.

<table>
<thead>
<tr>
<th>work element</th>
<th>symbol</th>
</tr>
</thead>
</table>

108. To refresh your memory, see if you can match these elements and their symbols listed above. If you miss two or more, better go back and review Lesson Three.

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>put-away</td>
<td>do</td>
<td>inspection</td>
<td>delay (incident, unplanned)</td>
<td>storage (a planned delay)</td>
<td>transportation</td>
</tr>
</tbody>
</table>

"(O, - , O, A, D, P)"
PROGRAMED TEXT, 3240 frames, paperback, 108 pp.,
5" x 7", available in 3 separate units at $3.75 each.
For use in SPEED machine, program reusable, $30.00.
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available at $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 and
$850.
Average Time: 5 hours (est.).
Next Revision:
(2 sample pages)
1. An insurance premium is to be financed on a policy that is 30 days old. The down payment is $47.60 and the monthly payments are $20. 50. How much money should be collected when the note is signed?

2. On monthly notes, the first installment is due within 30 days of the date of the policy, which should bear the same date as the note. If the premium is financed on a policy which is more than 30 days old, collect the down payment plus all installments due at the time the note is signed.

3. Governing regulations (continued)

The entire premium should be paid to the company or agent upon receipt of the signed endorsement. If a blanket agreement is in effect, payment should be made at once.

**NOTES**: A charge of $5 per dollar is made on late installments.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>signed endorsement, at once</td>
</tr>
<tr>
<td>3</td>
<td>$70.50</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>53.45</td>
</tr>
<tr>
<td>7</td>
<td>signed note, immediately</td>
</tr>
<tr>
<td>8</td>
<td>53.45</td>
</tr>
<tr>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>53.57</td>
</tr>
</tbody>
</table>

112
BLANKET AGREEMENTS (continued)

Blanket agreements will contain a provision that the insurance company will, when requested by the bank, cancel the policy on a pro-rata basis, rather than the normal short-rate basis. The entire unearned premium will then be returned to the bank.

Since the blanket agreement can not cover the data on individual policies financed under it, a special endorsement will be used for each note to show the bank's interest in the policies or their proceeds.

All blanket agreements will be kept on file by the installment loan administration. Each time an office requests approval of a new loan, installment loan administration will ascertain the existence of a blanket agreement.

1. Blanket agreements will stipulate that policies cancelled by the bank will be on a ______ basis.
2. If the policy cancelled was on a ______ basis the bank would not get all of the unearned premium back.
3. Why is a special endorsement required on each note to show the bank's interest in the policies and their proceeds?
4. Blanket agreements are kept on file by the ______.
5. When is the existence of a blanket agreement determined?

1. When approval of a new loan is requested.
2. short-rate
3. installment loan administration
4. Because individual policies can not cover the data on individual blanket agreements.
5. insurance division
6. Blanket agreements can not cover the data on individual policies.
7. When the premium is sent to the insurance company.
8. When the policy goes into effect.
9. pro-rata
10. Because blanket agreements only guarantee cancellation conditions.

CB-T-101-Q12
PROGRAMMED BUSINESS MATHEMATICS: CONCEPTS, SKILLS, & APPLICATIONS. Parts I, II, III, and IV. HARRY HUFFMAN, Professor of Business Education. Published by GREGG PUBLISHING DIVISION, MCGRAW-HILL BOOK COMPANY, 330 West 42nd St., New York 36, N.Y.

Programmed texts; Part I, 1,011 Frames; Part II, 767 Frames; Part III, 820 Frames; Part IV, 864 Frames; paperbacks; Part I, 214 pp.; Part II, 208 pp.; Part III, 224 pp.; Part IV, 208 pp.; 8-1/2" x 11", $2.25 each part.

Teacher's Manual available, $1.75.

Table of Contents.
Unit and Final Test(s) available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Individual testing—age 16 and up, I.Q. 95-110
Group testing—High school graduates enrolled in business colleges."

Prerequisites: "Senior in High School or high school graduate."

Average Time: 90-110 hours (est.).

Next Revision:
(3 sample pages)
What are two methods of ensuring accuracy in addition?

(1) 
(2) 

Any two of these: reverse addition, angular addition.
subtotal addition, the estimation procedure.

HORIZONTAL ADDITION TO INCREASE SPEED

77 Amounts horizontally arranged require skill in horizontal addition.
Without recopying, add the ten amounts below.

<table>
<thead>
<tr>
<th>0.47</th>
<th>0.23</th>
<th>0.50</th>
<th>0.65</th>
<th>0.75</th>
<th>0.96</th>
<th>0.84</th>
<th>0.23</th>
<th>0.47</th>
<th>0.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This method of addition is known as ______________ addition.

5.96 horizontal

78 What term is applied to horizontal addition when it is first done from left to right and then done from right to left?

Reverse addition

79 The special skill in horizontal addition involves care in avoiding confusion in the units, tens, hundreds, and other places. Without recopying, add these two numbers.

75,475 + 80,908 =

Can you use the procedure of reverse addition here?

161,973 yes

80 Without recopying, add these two numbers horizontally.
$147,650.90 + $237,486.45 = $

Verify by adding again horizontally.

Total = $
63  \( p, b, \text{ and } r \) are called algebraic symbols.

What branch of mathematics deals with algebraic symbols? 

<table>
<thead>
<tr>
<th>Algebra</th>
</tr>
</thead>
</table>

64  Business rule: Wage = hours worked \( \times \) rate.

Steve worked 37 hours and he earns \$7.75 per hour.

How much is his wage not figured, but do not figure these.

\[ w = \ldots \]

\[ w = 37 \times 2.25 \]

65  Rule: Wage = hours worked \( \times \) rate.

Use the algebraic symbol \( w \) for wage earned, \( h \) for hours worked, and \( r \) for the pay rate. How write the rule using the algebraic symbols.

\[ w = h \times r \]

66  Ringen designates the goods available for sale in his Mat's Drug as \( g \).

\[ g = \text{beginning inventory} + \text{purchases} \]

How does Ringen calculate \( g \)?

| By adding the beginning inventory to purchases |

67  Rule: The sum of the beginning inventory and the purchases equals the goods available for sale.

- beginning inventory = \( b \)
- purchases = \( p \)
- goods available for sale = \( g \)

How write the rule using algebraic symbols.

\[ g = b + p \]
Sometimes overtime is paid on a daily basis. In this case, overtime pay is given for all time worked over 8 hours. Smith works for a company which pays overtime on a daily basis. If he works 10 hours, he is paid at the regular rate for the first _________ hours and the overtime rate for the next _________ hours.
PROGRAMMED INSTRUCTION IN PERT AND CPM
DAVID E. MACKENZIE, PERT Project Manager
ALBERT E. HICKEY, President
SANFORD M. AUTOR, Director of Programming,
ENTELEK, Inc.
Published by ENTELEK INCORPORATED,
42 Pleasant Street, Newburyport, Massachusetts

Programed text, 700 frames (approx.), paperback in vinyl portfolio, 235 pp., 2 program sections at $17.50, Reference Section, $5.00, Vinyl Portfolio, $5.00.

Table of Contents.
Final test available, $.75 (includes grading).
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Industrial and military settings."
Prerequisites: None
Average Time: 15 hours (est.).
Next Revision: 1964.

(1 sample page)
Now that we have the expected time for each individual activity in the project, let's calculate how long it will take to accomplish the entire project.

To do this, turn to page R12. It's the same network as R10, but we've just cleaned it up a little. To get the total project time, begin with event 1, by finding the earliest event time ($T_e$).

1. No time has been expended prior to event 1, so indicate at event 1 that $T_e$ is 0.

The time to reach event 2 is the expected time to complete activity 1,2, or ________ days.
BUSINESS EDUCATION & ECONOMICS

PUTTING PUBLIC RELATIONS TO WORK
(Number two in the Management Skills Series)
EDWARD J. ROBINSON, Chairman, Communications Research Center; President, New England Consultants, Inc.
Published by LORD PRODUCTS, Inc.
28 West 22nd Street, New York, New York

Programed text, 285 frames, paperback, 148 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students (96) in Boston University, selected faculty at same."
Prerequisites: High school graduate.
Average Time: 4 hours (est.).
Next Revision: "Unknown."
(1 sample page)
5. Let's begin with the word "public." For our purposes, a public is a group of people who share a common interest. The employees of your company are an example of a public.

6. Good pay, working conditions, and opportunity for advancement are a few of the reasons______ shared by all members of your company's employees.______

7. Some publics, such as employees, are part of the organization. These are called internal publics. In contrast, customers would be an example of an external public.

8. This diagram shows the major publics of a typical manufacturing company. The employees are an internal public; most of the others are external.

9. Of course, publics will differ from one kind of organization to another. For example, if you were the public relations director of a hospital, your public could include:
   - doctors
   - nurses
   - patients
   - visitors
   - volunteers
   - staff
   - community (and others)

10. List two internal publics and three external publics of a university:

   Internal: _______ _______

   External: _______ _______ _______

11. Why distinguish between publics? Why not lump them all together? Because the interests of one public are often not common to the other.______

12. This brings us to a fundamental principle of communications: as the sender of a message, your interest must have something in common with the receiver's.______

13. Let's extend this principle: the more your message has in common with the interests and needs of your receivers, the more______ your message will be in producing the desired______

<table>
<thead>
<tr>
<th>Public</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

121
THE SALESMAN’S CALL REPORT
How and Why It Should Be Completed Accurately.
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn Street, Cambridge 38, Mass.

For use in a cardboard Machine supplied with program,
program reusable, 190 frames. $5.00.
Constructed Responses usually used, some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Persons with a high school reading level.”
Prerequisites: None.
Average Time: 1 3/4 hours (est.)
Next Revision: “None planned.”
(1 sample page)
### BUSINESS EDUCATION & ECONOMICS

**THE SALESMAN'S CALL REPORT**  
Technical Staff; GENERAL EDUCATION  
one sample page:

18. Let's see why and to whom call reports are important. First of all call reports are important to you. Do you agree?  

(Any answer is O.K.)

19. Maybe you said "Like hell! I don't agree!" Well, is money important to you? . . . . . . . . . . . . . . . .

(If you answered "No", you're sick, man, sick.)

20. The amount of money you make could be related to the quality of your call reports. So if money is important to you, call reports are ______ to you, too.

21. Don't scoff. Doesn't the amount of money you make depend upon how well you service your customers and, therefore, how willing they are to pay for your ser____ and your co____'s products?

22. Well, the cooperation you get from the home office is a vital part of your ability to service your accounts, which, when well serviced, help you to make money. So coop____ from the home office helps you to make m____.

23. The cooperation you get often depends on the quality of your call reports. It's not surprising that (good/poor) call reports get you more cooperation than (good/poor) call reports.

### 123
BUSINESS EDUCATION & ECONOMICS

SHORTHAND 33
AUDREY V. BOYD, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street; San Pedro, California.

Programed text, 10,800 frames, paperback, 360 pp.,
5" x 7", available in 10 separate units at $3.75 each.
For use in SPEED machine, program reusable, $100.00.
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine,
$700 & $850.
Average Time: 12 hours (est.).
Next Revision:
(1 sample page)
In shorthand we omit all silent letters and write only those letters which are heard. For example, say, 'see', keep—me.

First, we shall introduce five letters and show the shorthand circles which represent them.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>foam</td>
</tr>
<tr>
<td>e</td>
<td>see</td>
</tr>
<tr>
<td>s</td>
<td>safe</td>
</tr>
<tr>
<td>r</td>
<td>save</td>
</tr>
<tr>
<td>v</td>
<td>force</td>
</tr>
</tbody>
</table>

The shorthand outlines for a and e are about the size of the circle in the letters a and e. Also notice the three different lengths for a, e, and v.

In the following words, which have two circles are joined to the other circles:

<table>
<thead>
<tr>
<th>Word</th>
<th>Shorthand Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>see</td>
<td>(\underline{a}) (\underline{e})</td>
</tr>
<tr>
<td>saves</td>
<td>(\underline{a}) (\underline{e}) (\underline{s})</td>
</tr>
<tr>
<td>sees</td>
<td>(\underline{a}) (\underline{e}) (\underline{s})</td>
</tr>
</tbody>
</table>
BUSINESS EDUCATION & ECONOMICS

STENOSPEED, AN "ABC" SHORTHAND
JAMES L. EVANS
PAUL H. CARLSON, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,075 frames, paperback, 632 pp.,
8 1/2" x 11", bound in 3 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable,
$12.50.
Teacher's Manual: General Manual available for all TMI-
Grolier programs.
Final Test included.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Adults with no prior training in subject."
Prerequisites:
Average Time: 45-55 hours (based entirely on data);
standard deviation, 6.09 hours.
(3 sample pages)
**BUSINESS EDUCATION & ECONOMICS**

**STENOSPEED, AN “ABC” SHORTHAND**
Evans, Carlson; TEACHING MATERIALS CORPORATION
3 sample pages:

<table>
<thead>
<tr>
<th>Page</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>The final g is made by in written.</td>
</tr>
<tr>
<td></td>
<td>A simple curved downstroke is used for the final g. Write a final g.</td>
</tr>
<tr>
<td>107</td>
<td>The outline for lady is lady*** battery***</td>
</tr>
<tr>
<td></td>
<td>Practice these forms 10 times.</td>
</tr>
<tr>
<td>108</td>
<td>yoke *** by *** write *** plow ***</td>
</tr>
<tr>
<td></td>
<td>Initial g is made in standard form.</td>
</tr>
<tr>
<td></td>
<td>Practice these forms 10 times.</td>
</tr>
<tr>
<td>109</td>
<td>The sound of quota g (co) is expressed by a circle within a circle: co</td>
</tr>
<tr>
<td></td>
<td>Practice these forms 10 times.</td>
</tr>
<tr>
<td>110</td>
<td>groove *** yoke *** leap ***</td>
</tr>
<tr>
<td></td>
<td>Initial g is made in standard form.</td>
</tr>
<tr>
<td></td>
<td>Practice these forms 10 times.</td>
</tr>
</tbody>
</table>
The brief form for are, our and hour in A

We are good. ***

This is our money. ***

Practice the form for are, our and hour 15 times.

He will be here in an hour. ***

It is about an hour from now. ***

Are you with him? ***

It is our good luck.
Dear Sir:

I received your letter today which says that the exhaust on your car is not working well.

We can make an adjustment for you if you will allow us to come by in the next few days to fix it.

If we can find a defect in the making of the exhaust, the labor and materials will not cost you anything.
VALUE CONTROL
Value Engineering; Value Analysis
JAC D. MEACHAM, Publications Editor
CHARLES M. KEYS, Technical Publications Specialist
DALE BALL, Engineering Writer
CHOCK WAGERS, Engineering Writer
Published by GENERAL DYNAMICS, CONVAIR,
P.O. Box 1950, San Diego, California

(5 books), 5 1/2" x 8", $15.00 for all 5 books,
Book 1 available for $10.00.
Teacher's Manual available, free.
Table of Contents.
Unit and Final test included in each program.
Branching usually used; some Constructed Responses;
some Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Management, engineers, procurement, factory
personnel, administrators...writers and editors and
miscellaneous interested parties."
Prerequisites: None
Additional material required: "Workshop seminar at
individual business or company facility to supplement
instruction."
Average Time: 8 hours (est.).
Next Revision: "Currently being revised."
(1 sample page)
SELF-TEST (CONT)

10. When selecting the best ideas is there a limit to the number that can be selected?

☐ Yes
☐ No

11. Which of the following is used to make the first selection of best ideas?
   a. Design information.
   b. Knowledge and good judgment.
   c. Manufacturing capabilities.
   d. Specialty Vendor.

12. When gathering data to make a comparison for the purpose of selecting the best idea from the usable category, which of the following areas must be researched?
   a. Engineering.
   b. All areas affected by the project.
   c. Manufacturing.
   d. Specialty Vendor.
   e. Quality Control.

13. What two factors must be present in a quality product?
   a. M__________
   b. R__________

14. Final selection of the best idea is made by C__________
BRIDGE
JAMES L. EVANS
EDWARD RICKERT, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1,451 frames, paperback, 362 pp.,
8 1/2" x 11", $11.00.
For use in MIN/MAX II machine, $25.00; program reusable,
$10.00.
Teacher’s Manual: General Manual for all TMI-Grolier
programs available.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“9th and 10th graders and adults who had no prior
knowledge of the subject.”
Prerequisites:
Average Time: 15-20 hours (based entirely on data);
standard deviation, 7.11 hours.
Next Revision:
(1 sample page)
GAMES

BRIDGE
Evans, Rickert; TEACHING MATERIALS CORPORATION
one sample page:

| 22. Spades are trumps. Who takes this trick? | W Q | W 9 9 7 K 6 |
| 23. Which of the following shows suits ranked in descending (highest to lowest) order? | | V | O | S | C |
| 24. Clubs are trumps and W leads. Who takes this trick? | W Q A 9 8 7 | W 9 A 9 8 7 E |
| 25. If W leads and E takes the trick, what can you conclude? | W A 9 8 7 | W 9 K 9 8 E |
| 26. To follow suit is to play a card in the suit that is led. If Hearts are led, which card would you play? | | | |
| 27. You must follow suit if you can. If Spades are led and you have Q 9 and Q 3, which one must you play? (Q 9/ Q 3) | | | |
| 28. If Clubs are trumps and the Q 2 takes this trick, who led? | W Q A 9 8 7 E |

<table>
<thead>
<tr>
<th>SELF CHECK</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>W 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hearts were trumps.
GAMES

ELEMENTS OF BRIDGE
CHARLES H. GOREN, U. S. Bridge Authority
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 395 frames, hard cover, 417 pp.,
8-1/4" x 5-3/8", $4.95.
Table of Contents, Index.
Program available in Swedish.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "High school education or high school level
reading ability."
Average Time: 10-12 hours (est.).
Next Revision: "Dependent on publisher's sales require-
ments."
(1 sample page)
We will begin at the beginning — by assuming that you are a stranger to a deck of cards.

A new deck normally contains fifty-four cards, fifty-two of which are used in bridge. The two cards not used are the two Jokers, which should be set aside.

It is customary in bridge to use two decks of cards, preferably with contrasting backs to keep them from becoming intermixed. While one deck is being dealt, or passed out for play, the other deck is being shuffled, or mixed, for future play. This saves time in the handling of cards and speeds up the game. Only one deck of cards is in play at a time.

The fifty-two cards used in playing bridge consist of four distinct suits, or sets, of thirteen cards each. There are

- 13 Spades ♠
- 13 Hearts ♥
- 13 Diamonds ♦
- 13 Clubs ♣

Spades and Clubs are the black suits, and Hearts and Diamonds are the red suits.

Now you are ready for the first question. Choose the answer that you think is correct and turn to the page number indicated after the answer you choose.

The game of bridge is played with:

- Fifty-two cards in four suits and two Jokers. page 6
- Fifty-two cards in four suits. page 11
GAMES

H.S.-Adult Ed.

CONTRACT BRIDGE FOR BEGINNERS
SHIRLEY B. BITTERLICH, Programer, General Programmed Teaching Corporation
ANNE BEACH, Editor, GPTC
JAMES E. LYNN, Subject Matter Expert
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1866 frames, paperback, 373 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."

Table of Contents.

Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: Teenage and adult.
Field Testing: Adult."
Prerequisites: None
Additional material required: "Deck of playing cards."
Average Time: 17 hours (based entirely on data).
Next Revision:
(1 sample page)
The opening bid is one No Trump. A response of three in a suit shows an unbalanced hand containing at least 10 high card points and a good suit of at least five cards. This bid shows a hand stronger than a bid of two in a suit.

<table>
<thead>
<tr>
<th>stronger</th>
<th>stronger</th>
<th>weaker</th>
</tr>
</thead>
</table>

28. a) A response of two in a suit shows (how many) high card points.
   b) A response of three in a suit shows (how many) high card points.

a) less than 6
b) 10 or more

29. How many high card points are needed for the responder to raise an opening bid of one No Trump to three No Trump?

30. If the responder bids three in a suit, he does not have enough high card points to bid three No Trump.

True False

31. The opening bid is one No Trump. If the responder has a balanced hand containing at least 10 high card points, he responds with a bid of

three No Trump
GAMES

HOW TO SCORE BOWLING
BARRY BARNES, Programer, GPTC
JEANNE K. DAVIS, Programer, GPTC
PETER M. CABRINKA, GPTC
BETTY LOU C. DUBOIS, Editor, General Programmed Teaching Corporation
Published by GENERAL PROGRAMMED TEACHING CORPORATION, 1719 Girard, N. E., Albuquerque, New Mexico.

Programed text, 180 frames, paperback, 30 pp., 8-1/2" x 11", $1.00.
Table of Contents.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Those who do not know how to score bowling."
Prerequisites: None
Average Time: 1 hour (based entirely on data).
Next Revision:
(1 sample page)
GAMES
HOW TO SCORE BOWLING
Barnes, Davis, Cabrinka, Dubois; GENERAL PROGRAMMED TEACHING CORPORATION

one sample page:

F's first ball in the ninth frame knocked down 6 pins, but left a split. He fouled while delivering his second ball.

Mark F's score in the ninth frame.

The diagrams show what happened to the setup in G's ninth frame. Score the ninth frame for G.

The diagrams indicate that E has finished his 10th frame. Record his score.
BEGINNING CHESS
CARL CHENEY, Programer, Learning, Incorporated
GEORGE KOLTANOWSKI, International Chess Master
Published by UNIVERSITY MICROFILMS, INC.,
313 North First Street, Ann Arbor, Michigan

For use in MICRO-AID and KONCEPT-O-GRAPH
machines, 420 frames.
Table of Contents.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grade 4 to adult.
Prerequisites: Grade 7 reading level.
Additional Material Required: "Chess Board and pieces."
Average Time: 4 hours 47 minutes (based entirely on
data); standard deviation, 27 minutes.
Next Revision:
(1 sample page)
The three conditions necessary for castling are:

1. Neither the King nor Rook may have moved.
2. The squares between the Rook and King must be empty.
3. The King may not move into, out of, or through check.

This King (may/may not) castle.

The King and Rook in diagram (4) may castle on the King-side.
HOW TO WATCH A FOOTBALL GAME
SHEILA LEVINSKY, Programer, Learning, Inc.
FRANK KUSH, Head Football Coach, Arizona State University
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona

Programed text, 140 frames, paperback, 43 pp., 8-1/2" x 11", $1.75.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental population: Adults. Field testing: High School students."
Prerequisites: Grade 7 reading level.
Average Time: 1 hour (est.).
Next Revision: "The program is the final revision."
(1 sample page)
HOW TO WATCH A FOOTBALL GAME
Levinsky, Kush; LEARNING INCORPORATED
one sample page:

22. There are three main ways for a team to score:
the touchdown, the safety and the field goal. A team
gets six points for a touchdown, three points for a
field goal, and two points for a safety.

23. Two ways to get a touchdown are:
A player can run with the ball past the opponent's goal
line, or he can catch and run into the end zone for
already be there when he catches it. A touchdown
occurs when the ball is in possession and past
the goal line.

24. When the ball is carried past the opponent's goal
line by running or passing, your team has scored
a touchdown (TD).

25. A touchdown gets the ball past the goal line. For
a field goal, the ball has to be kicked over the crossbar
between the goal posts.

26. When a player has the ball and he can run with it, pass
it, or kick it, A team gets a field goal when its player
touchdown when he kicks, runs, or passes the
ball to a teammate, getting it past the opponent's goal
line.

27. If a Tiger runs the ball past the Braves' goal line,
or a Tiger receives a teammate's pass and crosses the
Braves' goal line, then the Tigers have scored a
touchdown (TD).

28. If a Tiger place-kicks the ball between the Braves'
goal posts, the Tigers have gotten a
field goal.

29. A touchdown gets the ball past the opponent's
between the opponent's goal line.
A field goal gets the ball
between the opponent's goal line.
NUMISMATICS
A Guide for Coin Collectors
JAC D. MEACHAM, programmer
M. H. MONROE, numismatist
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 670 frames, paperback, 150 pp.,
5 1/2" x 8", $4.95.
For use in DISCOVERY COLUMBUS machine, $38.95;
program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program
reusable, $15.00.
For use in RHEEM CALIFONE device.
Table of Contents.
Final Test available.
Constructed Responses usually used; some Multiple
Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Old and new collectors of coins 12 years old and up."
Prerequisites: None
by Whitman publishers."
Average Time: 4 hours (est.).
(1 sample page)
Coins are graded according to their condition, which are compared to a freshly minted coin from the mint. There are eight (8) accepted grades for coin collectors. Coins are graded by their condition.

<table>
<thead>
<tr>
<th>1- condition</th>
<th>2- The (six, four, eight) grades of coins are derived from the condition of the coin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2- eight</td>
<td>3- The PROOF coin is the very highest grade a coin can have. A proof coin has a high luster, mirror-like finish produced by striking a polished die into the metal. Coins are the highest grade a coin can have.</td>
</tr>
<tr>
<td>3- proof</td>
<td>4- Proof coins are highly regarded by collectors and require extreme care to protect their ______-like finish.</td>
</tr>
</tbody>
</table>
GAMES

ROLLER SKATING SAFETY
DARLENE HARING, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 20 frames, $.15.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL POPULATION(S): Grade 3.
Prerequisites: “Grade 3 reading level.”
Average Time: 8-15 minutes (est.).
Next Revision: “The program is the final revision.”
(1 sample page)
GAMES

ROLLER SKATING SAFETY
Haring; LEARNING INCORPORATED
one sample page:

1. Always take off your skates to cross a busy street.
2. To be safe, take off your skates before you cross the street.
3. Don't fall on the stairs. You should take off your skates before you go up and down the stairs.
4. Before you go up and down stairs, take your skates off.
5. Take your skates off before you go up and down the stairs.
6. Always watch for cars and before you cross the street.
7. When we skate, it's better to be Safe Sam than Sorry Sally.

Safey rules help us to be Safe Sam.

Remember these skate safety rules: Skate on the sidewalk, not on the street.

Draw Safe Sam, Draw Sorry Sally.
GRAMMAR & USAGE

BASIC ENGLISH 37
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 16,200 frames, paperback, 540 pp.,
5" x 7", available in 15 separate units at $3.75 each.
For use in SPEED machine, program reusable, $150.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine,
$700 & $850.
Average Time: 25 hours (est.).
Next Revision:
(1 sample page)
GRAMMAR & USAGE

BASIC ENGLISH 37
Snyder; EDUCATION ENGINEERING
one sample page:

In SOME of the "demons" THERE is the temptation to omit certain letters.

COULD OFTEN SOME

HALF

ANSWER

In ad/di/tions to the temptation to omit letters, THERE is the question of meaning WHICH may confuse.

EXAMPLES

I DREW the lesson so well that I did not have to GUESS.

I had an HOUR left to BUY the gifts at the store.

He can talk for a WHOLE evening and his voice will not be ROAR.

QUESTIONS

1. Of as we miss one of the questions.
2. He ___ of the questions he ___ did not answer.
3. He ___ of the questions he ___ answer.
4. I can carry enough money in an ___er to buy our lunch.
5. His voice was so he ___ of that he took a hole week to recover.

ANSWERS

1. f and y
2. f and w
3. h and u
4. f and v
5. f and uv
6. a and w
7. h and a
8. a and w
9. h and u
10. h and v

X188Q1 - 09
GRAMMER & USAGE

ENGLISH I and II
EMANUEL BIERMAN, programer, assistant principal,
Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of
Technology
Published by CENTRAL/SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95;
program not reusable, 500 frames in I, 500 in II, I or
II included in price of machine.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DéVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)
ENGLISH II

34. A compound sentence can be divided into two simple sentences, each with a __________ and a __________ subject, predicate

35. We place the comma before the __________ in a compound sentence.

36. In a compound sentence, there is a subject and predicate both __________ and __________ the conjunction.

37. A compound sentence is made up of two or more simple sentences which are closely related in thought.
   a) Jones scored the touchdown, and he kicked the extra point.
   b) Mary writes well, and her hair is brown.
   In which sentence do the ideas fit better together. Sentence a
GRAMMAR AND USAGE

ENGLISH 2600, REVISED EDITION
A Programed Course in Grammar and Usage

ENGLISH 3200

JOSEPH C. BLUMENTHAL, former Head of English Dept., Mackenzie High School, Detroit, Michigan.

Published by HARCOURT, BRACE & WORLD, Inc., 750 Third Avenue, New York 17, New York.

2600: programed text, 2632 frames, paperback and cloth cover, 448 pp., 6 3/8" x 9", $2.88 (paperback), $3.88 (cloth cover).*

3200: programed text, 3208 frames, hardcover and paperback, 544 pp., 6 1/4" x 9", $3.36 (paperback), $4.36 (hardcover).*

Teacher’s Manual available; 2600: available without charge on class orders; 3200: $.60.

Table of Contents (both volumes). 
Unit, Final, Diagnostic Test(s) available (both volumes).
2600: Constructed and Multiple Choice Responses usually used; no Branching.
3200: Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
2600: “Tested in many school districts throughout the country.” 3200: “Three classes in New York City high schools.”

Other using population(s): 2600: Grades 7-12. 3200: College freshmen, also grades 9 and 10.
Prerequisites: 2600: “None other than grade 9 reading level.” 3200: “1 to 4 years of study of correct English.”

Average Time: 2600: 8 to 14 hours (based entirely on data). 3200: 13-30 hours, average 22 hours (est.).

(2 sample pages)

* A kit of forms for English 2600 and English 3200 “For Controlling Paper Work” is available from Developmental Corporation of America, 83 Clover Ave., Floral Park, N.Y.
### GRAMMAR & USAGE

**ENGLISH 2600, REVISED EDITION**  
**ENGLISH 3200**  
Blumenthal; HARCOURT, BRACE & WORLD  
2 sample pages:

<table>
<thead>
<tr>
<th>dropped</th>
<th>All my friends go to church. Which word would change if you changed this sentence from present to past?</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>120</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>subject complement</th>
<th>10 Review Recognizing Basic Sentence Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>339</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>more</th>
<th>The weather is cold. The weather is very cold. In both sentences, the adjective cold modifies the noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>559</td>
<td>560</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>verb</th>
<th>Prepositional phrases, too, can be used as adverbs. WHEN? Pete awake in the morning. The prepositional phrase in the morning tells when Pete</th>
</tr>
</thead>
<tbody>
<tr>
<td>779</td>
<td>780</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>adjective</th>
<th>He drove around the block. He looked for a place to park. He drove around the block, looking for a place to park. To change the second sentence to an -ing word group, drop the subject He, and change the verb looked to take</th>
</tr>
</thead>
<tbody>
<tr>
<td>999</td>
<td>1000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>take</th>
<th>The simple past form of this verb is took. The form that must be used with have, has, or had is (took, taken).</th>
</tr>
</thead>
<tbody>
<tr>
<td>1219</td>
<td>1220</td>
</tr>
</tbody>
</table>

---

*Page 153*
Henry is happy.

Henry was the chairman.

A verb like is or was is called a linking verb because it links a noun, pronoun, or adjective that follows it with the _______ of the sentence.

When might we use a semicolon in preference to a conjunction? If there are too many and’s in a sentence, we may get rid of one by substituting a semicolon.

The patient asked for steak and potatoes, and the doctors and nurses were astonished.

How many and’s are there in this sentence?

Roxanne made a rude remark for which there was no excuse.

My sister works for Dr. Mack, and his office is downtown.

We are planning a pageant to dramatize the history of our town.

The food was expensive and poor.

Supply the missing words to complete the “not only . . . but also” device:

Not only __________________________ but __________________________

S, F, or R-S?

The only-one in our family who plays a musical instrument.

page 269
ENGLISH GRAMMAR 28
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 6480 frames, paperback, 216 pp.,
5" x 7", available in 6 separate units at $3.75 each.
For use in SPEED machine, program reusable, $60.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine,
$700 & $850.
Average Time: 12 hours (est.).
Next Revision:
(1 sample page)
GRAMMAR & USAGE

ENGLISH GRAMMAR 28
Snyder; EDUCATION ENGINEERING
one sample page:

PROMOVS
A pronoun takes the place of a noun. It is a substitute for a noun. A noun for which a pronoun stands is called an antecedent (the word that stood before).

EXAMPLES

1. Jim is intelligent, but she is not pretty.
   Jim is the antecedent. She is the pronoun.

2. The man bought a car, but he did not like it.
   He is the antecedent of it. It is the antecedent of it.

QUESTIONS
In these sentences select (p.) pronoun and (a.) antecedent (if any).

1. In Washington Congress passed the bill and sent it to the President.
2. Wilson and they applied for the job, but both were disappointed.
3. Who is coming to the party?
4. The tickets were bought by Dave, but he did not receive them.
5. I oppose the resolution which they proposed

ANSWERS

1. bill (p. Washington (a))
2. it (p. which (a) resolution (a) they (a))
3. job (p. both (a))
4. who (p. plenty (a))
5. who (p.)
6. tickets (p. (a)) he (p. receive (a))
7. he (p. Dave (a)) there (p. tickets (a))
8. of (p. bill (a))
9. resolution (p. oppose (a))
10. both (p. William (a))
GRAMMAR & USAGE

ENGLISH GRAMMAR U-3003
UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION
Published by UNIVERSAL TEACHING MACHINE
INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program re-
usable, 2160 frames, machine and program, $25.00
(school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Grade Level - 5-9.”
Other using population(s): “High school students and adults.”
Prerequisites: None.
Average Time: 28 to 34 hours (est.).
Next Revision: August, 1963.
(2 sample pages).
**GRAMMAR & USAGE**

**ENGLISH GRAMMAR U-3003**
Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE

2 sample pages:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>619</td>
<td>This mark (.) is called a period. A period is used at the end of a statement.</td>
<td></td>
</tr>
<tr>
<td>620</td>
<td>A sentence that asks something is called a question, and it has this mark (?) after it. Are you going to the movies?</td>
<td>Is</td>
</tr>
<tr>
<td>621</td>
<td>Please write the correct mark needed after this sentence: Did you see Mary (?)</td>
<td>?</td>
</tr>
<tr>
<td>622</td>
<td>Many errors are made when the words who and whom are used. Who is used in speaking about one person or thing. Was the girl with John?</td>
<td>Was</td>
</tr>
<tr>
<td>623</td>
<td>John the one we saw.</td>
<td>was</td>
</tr>
<tr>
<td>624</td>
<td>Mary (was/were) the person who received all &quot;A's.&quot;</td>
<td>was</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>627</td>
<td>Come sometimes needs a helping word, such as \textit{like}, \textit{has}, or \textit{had}. How many children _____ come to the park? What helping word does \textit{come} need in this sentence?</td>
<td>have have</td>
</tr>
<tr>
<td>628</td>
<td>Mary \textit{has/have} come to find leaves. Write the correct helping word.</td>
<td>has</td>
</tr>
<tr>
<td>629</td>
<td>The children \textit{have/have} come to the woods.</td>
<td>have</td>
</tr>
<tr>
<td>630</td>
<td>A word that does \textit{not} need a helping word is \textit{walk}. She _____ to the party.</td>
<td>came</td>
</tr>
<tr>
<td>631</td>
<td>Outside \textit{comes/come} with red and yellow leaves.</td>
<td>come</td>
</tr>
<tr>
<td>632</td>
<td>Sometimes \textit{comes/come} needs a helping word.</td>
<td>come</td>
</tr>
</tbody>
</table>
GRAMMAR & USAGE

ENGLISH USAGE
THORWALD ESSENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 600 frames, paperback, 120 pp., 5" x 8", $7.85 (includes response device).

"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."

Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average third-grade class."
Prerequisites: "Ability to read at third grade level."
Additional material required: "Response device described above."
Average Time: 10 hours (est.).
Next Revision: "Unknown."
(1 sample page)
This lesson will help you learn the correct ways to use the words there, their, and they're.

**THINK:**
- If you mean they are, use they're.
- To show ownership (somebody owns something), use their.
- Otherwise, use there.

Say this sentence to yourself, filling the blank with the correct word.

- **5-20** Their
- **1-3** They're
- **7-12** There

Did you remember the rules?

- They're too busy to go now is correct.
- They're means they are.
- Their shows ownership.
- In other cases, use there.

Now, let's try picking the correct word for the blank in another sentence.

- **14-27** there
- **1-9** their
- **9-17** they're

You are doing fine. Let's see how well you do on this one.

- They want to go in **9-10** they're car.
- **23-26** their
- **6-13** there
FIGURES OF SPEECH
WINIFRED NEAL, Programer, Learning Incorporated
JOSEPH P. COLLIGNON, English Dept. Arcadia High
School, Scottsdale, Arizona.
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 308 frames, paperback, 59 pp., 7" x 10",
$1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used: some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"...Small representative samplings at appropriate
grade levels tested informally on one-to-one basis
with programer. Small representative samplings
under controlled conditions (Dukane Redi-tutor using
35 mm. film) for each revision of program. Program
has been through 8 complete revisions, each revision
based on data obtained from formal machine testing.
Field testing in progress: Classroom testing from
8th through 12th grades, administered by classroom
teachers. Test areas distributed geographically
from Florida to California. All testing conducted by
Learning Incorporated."

Prerequisites: Grade 9 reading level.
Average Time: 2 hours, 19 minutes (based entirely on
data); standard deviation, 27.2 minutes.
Next Revision: "The published program is the final
revision."

(1 sample page)
FIGURES OF SPEECH
Neal, Collignon; CORONET INSTRUCTIONAL FILMS
one sample page:

Set 2
Basic Figures of Speech

2-1 Find the sentence that contains a figure of speech:
A) "There are ten stores in our town."
B) "She has a beautiful flower garden."
C) "That girl is as delicate as a glass doll."
Sentence ______.

2-2 Find the sentences that contain figures of speech:
A) "That dancer is as graceful as a snowflake."
B) "That dancer is like a snowflake."
C) "That dancer is beautiful and graceful."
Sentences ( ), and ( ).

2-3 A) "That dancer is as graceful as a snowflake."
B) "That dancer is like a snowflake."
These figures of speech use the words like and as to describe a dancer by comparing her to a ______ ( ).

2-4 A figure of speech that uses like or as in the comparison is called a simile.
A) "Our house is like an overstuffed suitcase."
B) "Our house is as cramped as an overstuffed suitcase."
Each sentence contains a figure of speech called ______ ( ).
GRAMMAR & USAGE

FUN WITH WORDS
Homonyms-Sound Alike Words
RUTH B. ROSENBERG, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use with HONOR TEACHING MACHINE, $20 (approx.)
including 3 programs; program reusable, 200 frames;
$2.00-$2.50.

Constructed Responses sometimes used; some Multiple
Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Public and private schools.”

Prerequisites:
Average Time:
Next Revision:
(1 sample page)
Use the correct word to complete this rhyme:

Hear and here are twin words that sound just the same.
To tell them apart is the aim of our game.
The trick's in the spelling; put h before ear.
And it's clear far and near what the word is we.

| a. here |
| b. hear |

Press and hold the button of your choice.

No.
Read these lines again!
The trick's in the spelling; put h before ear.
And it's clear far and near what the word is we.

| a. here |
| b. hear |

Press and hold the button of your choice.

You hear with your ears.
(illustration)

No answer needed

Here's another rhyme to see if you remember.
There are many ways to spell "to."
It's so hard to know just what to do!
Here is one that is fun:
You said add one and one.
While the answer, of course, is a two.

| a. too |
| b. two |
| c. to |

Press and hold the button of your choice.
GRAMMAR AND USAGE

PROGRAMMED ENGLISH
A Modern Grammar for High School and College Students
M. W. SULLIVAN
Published by THE MACMILLAN COMPANY
60 Fifth Avenue, New York 11, New York

Programed text, 1782 frames, hard cover, 430 pp.,
8-1/4" x 11", $7.80.
Teacher's Manual available, $1.25.
Unit, Final and Diagnostic Test(s) available.
Constructed Responses usually used; some Multiple
Choice Responses; and no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"The course has been revised a total of 10 times making use of the combined efforts of 20 authors and
critics. It has been field tested in the schools in and around Palo Alto, California from the seventh
through the twelfth grades and at the college level."
Other using population(s): "The material has been tested
from the seventh grade level through the college
graduate level and in addition a total of 82 individuals
ranging in age from 12 to 72 have individually tested
the material."
Prerequisites: "Only the ability to read normal English
sentences of the grade equivalent of 7 is needed."
Average Time: 24 hours (based entirely on data); standard
deviation, 4 hours.
Next Revision: June 1964.
(1 sample page)
Words are divided into classes. We call the largest class Nouns.
Nouns are a class of words.

In English the class of words called nouns is larger than all the other classes of words combined.

We call the largest class of English words nouns.

You will learn a number of ways to recognize and to use the class of nouns called nouns.

The words in a class are all alike in some way. All the members of the class of words called nouns have characteristics in common.

You will see that nouns occur in special positions in English sentences. Any word that occurs in a noun position must be a noun.
GRAMMAR & USAGE

STRENGTHENING GRAMMATICAL CONCEPTS
FRANCES J. ZALENKA, Programer, GPTC
JEROME B. WHITE, Programer, GPTC
ANNE BEACH, Editor, GPTC
PAUL H. CARLSCN, Editor, General Programmed
Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2400 frames, paperback, 600 pp.,
8-1/2" x 11", $

Teacher’s Manual: “Instructions to teacher included in
preface.”
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental testing: 8th graders and above.
Field testing: High school English students.”

Prerequisites: None.
Average Time: 24 hours (based entirely on data).
Next Revision: 1968.
(2 sample pages)
GRAMMAR & USAGE

STRENGTHENING GRAMMATICAL CONCEPTS
Zalenka, White, Beach, Carlson; ENCYCLOPAEDIA
BRITANNICA PRESS
2 sample pages:

33 Punctuate the sentences.
   a) I will not go to the game nor will I go to the party
   b) Robert entered the contest and he won

34 Combine the two simple sentences into a compound sentence using the
   conjunction "but," and punctuate it.
   a) Toast tastes good with butter.
   b) It tastes better with jam.

35 Punctuate the sentences.
   a) Hay is fine but straw is cheaper
   b) Consideration for others is important but many people fail to realise this

36 Punctuate the sentences.
   a) A little common sense never hurt anybody but some people disregard it
   b) The fire was billowing and the people were running out of the building
37. Combine the two simple sentences into a compound sentence using the conjunction "but," and punctuate it.
   a) Scotch tape holds fairly well.
   b) Glue does a better job.

Scotch tape holds fairly well, but glue does a better job.

38. Does the underlined clause in the following sentence make a complete sentence standing alone?
   Yes
   No
   When I tried out for the football team, I was very nervous. CIRCLE THE CORRECT ANSWER

39. Circle the number of the sentence which has a clause that cannot stand alone.
   1) When the sun goes down, the moon comes up.
   2) Scotch tape holds fairly well, but glue does a better job.

   2

40. A complex sentence contains at least one clause which cannot stand alone and one clause which can stand alone. Circle the complex sentence.
   a) After the children left for school, the house became quiet.
   b) The children left for school, and the house became quiet.

   b
GRAMMAR & USAGE Jr. H.S.

STUDENTUTOR LIBRARY OF SENTENCES, WORDS, REFERENCES.

TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, INC.,
96 Mount Auburn St., Cambridge 38, Mass.

For use in STUDENTUTOR, program reusable, 1500 frames, programs are supplied in a kit which contains 5 machines, 5 exhibit books, and 36 scrolls, $75.00.

Teacher’s Manual available, free with kit.

Table of Contents.
Unit, Diagnostic Test(s) available. Pre and Post tests are interchangeable.

Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Pre and post tests used on 8-10 students per revision.
Several revisions to achieve negligible error rates.

Average Time: 16 to 18 hours (est.).
Next Revision: “None planned as yet.”

(2 sample pages)
**Excerpt from**
**Section I: SENTENCES**
Program 1: Understanding Sentences

5. The man ate the fish.
   The fish ate the man.

   Changing the order of words in a sentence can make ...
   (a huge difference/no difference) in the meaning of a sentence.

   a huge difference (especially if you were the man in this sentence.)

6. Ate fish man the the.

   Here are the same five words again. This time they are placed in alphabetical order. Without switching words around can you tell what this "sentence" means? ...
   (Yes/No)

   No

7. In order for us to understand a sentence, the words must be placed in a certain order. The words in any meaningful sentence are arranged ...
   (in any order/in a very special order.)

   in a very special order

---

**Excerpt from**
**Section II: WORDS**
Program 3: There, They're, Their

1. The single word "they're" stands for the two words "they are". The two words "they are" can be combined to form the single word "th___'re".

   "they're"
2. When we combine the words "they are" to form the word "they're" we leave out one letter and insert an apostrophe (') in place of that letter. The letter that we leave out to form "they're" is the letter "a" (what letter?).

3. In forming "they're" from "they are" we omit the letter "a" and insert an apostrophe in its place between the letters "y" and "r".

Excerpt from
Section III: REFERENCES
Program 4: Page Numbers

| 5. Herbert gobbled up bananas, pears and grapes. | (a) bananas and pears. (Are you wondering what this has to do with indexes?) |
| This sentence means that Herbert ate | (a) bananas and pears. (Are you wondering what this has to do with indexes?) |
| (a) bananas and pears. | (a) bananas and pears. (Are you wondering what this has to do with indexes?) |
| (b) bananas or pears. | (a) bananas and pears. (Are you wondering what this has to do with indexes?) |

| 6. Oscar loves licorice, fishing and girls. | and |
| A comma, then, is sometimes used instead of the word "and". | and |

| 12. Ice cream, 29, 33 | 29 and 33 (Do you see now what Herbert's bananas and pears have to do with indexes?) |
| This index entry means that the subject ice cream is discussed on pages | 29 and 33 (Do you see now what Herbert's bananas and pears have to do with indexes?) |
SYNONYMS, ANTONYMS, HOMONYMS
MARTA ZABORSKA, Programeer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 34 frames, $.15.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 5, 6.
Prerequisites: “Grade 6 reading level.”
Average Time: 12.8 minutes (based entirely on data);
standard deviation, 3.8 minutes.
Next Revision: “The program is the final revision.”
(1 sample page)
9. Skip and leap are ___.

10. When you turn left and your dog turns right, you are turning in the ___ of opposite ways.

11. Right and left are not ___.

12. The special name for a word which means the opposite of another word is ___.

13. An ___ for hot would be ___.

14. A word which means the opposite of another is ___.

15. Fast and slow are ___ but fast and quick are ___.

16. A word (nym) which means the opposite (anto) is called ___.

17. Say to yourself silently sum and some. Both words sound ___ (alike or different?)

alike
ACHIEVING CLARITY THROUGH PUNCTUATION

ANNE BEACH, Editor, GPTC
ROBERT A. FAWVER, Programer, GPTC
WILLIE Y. HUFF, Programer, General Programmed
Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 300 pp.,
8-1/2" x 11", $[

Teacher's Manual: "Instructions to teacher included
in preface."

Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 8th-10th grade students.
Field testing: High school students."

Prerequisites: None.
Average Time: 18 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)
What is so funny. This exclamatory sentence, if not asked with strong feeling, would have ended with ____ (Write the mark)

Write the end punctuation of the following sentences (a) expressed without strong feeling and (b) expressed with strong feeling.
1. Tread water (a) ____ (b) ____
2. We'll save you (a) ____ (b) ____
3. Why don't you learn to swim (a) ____ (b) ____
4. (a) ____ (b) ____ 5. (a) ____ (b) ____ 6. (a) ____ (b) ____

Match the following forms of sentences with the sentences on the right.
1. Imperative ____  A. What a handsome waiter we have!
2. Declarative ____  B. Would you like the shrimp cocktail?
3. Interrogative ____  C. Give me the check.
4. Exclamatory ____  D. This roast-beef is excellent.

1. C  A  B  A
2. B  C  A  D

Complete the following statements.
1. The first letter of a sentence is a _________ _________
2. Punctuation marks which may end a sentence are _________ _________
   (Write the marks)
3. A sentence expresses a _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _________ _______
GRAMMAR AND USAGE

MODERN ENGLISH SERIES: PUNCTUATION
LLOYD E. HOMME
POLO C. DE BACA, both of Teaching Materials Corporation. Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 1,178 frames, paperback, 272 pp.,
8 1/2" x 11", $8.50.
For use in MIN/MAX II, $25.00; program reusable, $7.50.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Age range 12 to 21 years, 7th grade through high school, average age of 14.7. Average school grade:
4th month of 9th year.”
Other using population(s): “Review for college students,
technical writers, adults performing secretarial duties.”
Prerequisites:
Average Time: 8-12 hours (based entirely on data).
(1 sample page)
Copy the word "ellipsis."

<table>
<thead>
<tr>
<th>ellipsis</th>
<th>ellipsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>The ellipsis shows that one or more words have been left out of a quotation. Which sentence shows the correct use of an ellipsis? 1. &quot;To be or not to be...&quot; 2. John came yesterday...</td>
</tr>
<tr>
<td>150</td>
<td>Choose the correct answer. The paper quoted Mr. Bark as saying, &quot;(---/...) and furthermore, we need at least three million dollars for this project.&quot;</td>
</tr>
<tr>
<td>154</td>
<td>Which is correct? &quot;Fourscore and seven years ago our fathers (.../...)&quot; The ellipsis shows that one or more words have been left out of a quotation.</td>
</tr>
<tr>
<td>155</td>
<td>What does the ellipsis show? The ellipsis shows that one or more words have been left out of a quotation.</td>
</tr>
</tbody>
</table>
GRAMMAR & USAGE

PROPER PUNCTUATION

KELLOGG SMITH
LEIGHTON STEELE

*ADRIENNE ZAHNISER, all of U.S.I. Educational Science Division.

Published by DOUBLEDAY & COMPANY, INC., 575 Madison Avenue, N.Y.C.

Programed text, 266 frames, hard cover, 277 pp., 8 1/4" x 5 3/8", $4.95.

(Asimilar program, PUNCTUATION, is available in TM format from: EDUCATIONAL SCIENCE DIV., U.S. INDUSTRIES, INC., 250 Park Avenue, N.Y.C.

For use IN AUTOTUTOR MARK II. $1,250; Program reusable, $70.00.)

Table of Contents, both programs; Index, programed text.

Unit Test(s) available, machine program.

Multiple Choice Responses and Branching always used, no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

College remedial English students.

Prerequisites: High school education.

Additional Material required: Dictionary (optional), pencil and paper.

Average Time: 5-7 hours (est.), programed text; 4-10 hours (est.), machine.


(1 sample page)

*Machine program only.
YOUR ANSWER: The colon may be used only after a complete statement.

Right.

This is a carry-over from the older use of the colon to separate the independent elements of sentences. You should write

I bought a box of crayons, some paper, and a stencil-cutter.

because I bought is not a complete statement. If you want to introduce the series with a colon, you should write

I bought the following items: a box of crayons, some paper, and a stencil-cutter.

for I bought the following items is a complete statement, and can stand by itself.

Which of the following sentences is incorrectly punctuated?

I chose: the red, the blue, the green, and the mauve.

What is the cause of your failure: sloth or neurosis?

Again, nothing is asserted: no belief, no truth, no philosophy.
GRAMMAR & USAGE

PUNCTUATION & CAPITALIZATION 26

GEORGE M. SNYDER, Programer

Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 3240 frames, paperback, 108 pp.,
5" x 7", available in 3 separate units at $3.75 each.
For use in SPEED machine, program reusable, $30.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 5 hours (est.).
Next Revision:
(1 sample page)
THE APOSTROPHE (´)

The apostrophe is a clever invention used to compress words into one word. The apostrophe indicates contractions. To contract means to reduce in length.

**EXAMPLES**
- does not - didn't
- do not - don't
- can not - can't
- he is - he's
- It is - It's
- there is - there's
- they are - they're
- who is - who's

**EXAMPLES**
- Where is the book? It is the book, not here. The
  book is not there. to keep. It is yours. The dog
  wagging his tail is more

**QUESTIONS**

Is the usage understood right or wrong?

**ANSWERS**

1. **WRWW**
2. **WRWW**
3. **WRWW**
4. **WRWW**
5. **WRWW**
6. **WRWW**
7. **WRWW**
8. **WRWW**
9. **WRWW**
10. **WRWW**

**WARNING**

Do not use an apostrophe with the possessive pronouns or with WHOSE.
GRAMMAR & USAGE

USING CAPITAL LETTERS
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)

Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 300 frames, paperback, 70 pp., 5" x 8", $6.45 (includes response device).

"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."

Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average third-grade class."

Prerequisites: "Ability to read at third-grade level."

Additional material required: "Response device described above."

Average Time: 5 hours (est.).
Next Revision: "Unknown."

(1 sample page)
GRAMMAR & USAGE

USING CAPITAL LETTERS

Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.

one sample page:

The name of any school subject that comes from the name of a country should be capitalized. Look at this sentence: He is taking a course in French. In this sentence, should the word French be capitalized?

1-3 Yes
1-5 No

The word French comes from the name of the country, France. Therefore, ?

2-4 the word French should be capitalized.
2-5 the word French should not be capitalized.

The sentence should look like this: ?

3-4 He is taking a course in French.
3-5 He is taking a course in French.

Is it true that the name of any school subject should be capitalized?

4-8 Yes
4-9 No

Which statement is true?

5-8 The name of any school subject that comes from the name of a country should be capitalized.
5-9 The name of any school subject should be capitalized.
GRAMMAR & USAGE

USING PUNCTUATION
THORWALD ESBESEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 600 frames, paperback, 170 pp., 5" x 8", $7.85 (includes response device).
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."

Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average third-grade class."
Prerequisites: "Ability to read at third-grade level."
Additional material required: "Response device described above."

Average Time: 10 hours (est.).
Next Revision: "Unknown."
(1 sample page)
GRAMMAR & USAGE

USING PUNCTUATION
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.

one sample page:

SAMPLE FRAMES: USING PUNCTUATION

Sometimes, when we speak directly to a person, we use that person's name: George, are you coming?

Notice ? after the word George.
6-8 the comma
6-9 the exclamation point

Look at the following sentence: Where did you go, Sally?
Notice the before the word Sally.
6-12

Look at the following sentence: Say, Tom, what are you doing?
Notice the on each side of the word Tom.
16-28

Which rule fits these three examples?
7-8 When you speak directly to a person and use his name, always put a comma on each side of his name.
7-9 When you speak directly to a person and use his name, you should use a comma or commas to separate his name from the rest of the sentence.
GRAMMAR AND USAGE

BEGINNING SPELLING

THORWALD ESSENSE

DONALD HURST

CHARLES JENKS

DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)

Published by E-Z SORT SYSTEMS, LTD.,

45 Second Street, San Francisco, California.

Programed text, 1500 frames, paperback, 105 pp.,

5" x 8", $____

"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."

Teacher's Manual available, included with program.

Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

"Primary grade students."

Prerequisites: "Readiness ability to discriminate between numbers and letters."

Additional material required: "Response device described above."

Average time: 120 hours (est.).

Next Revision: "Unknown."

(2 sample pages)
BEGINNING SPELLING
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.

2 sample pages:

SAMPLE FRAMES: BEGINNING SPELLING

1. Cake
   9-14 9-11 2-4 5-7

2. Apple
   9-17 10-12 20-28 9-12 2-12

3. Chicken
   9-21 13-14 5-12 14-27 4-15 7-10 5-11

4. Chair
   21-27 14-24 4-10 12-23 6-21

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### BEGINNING SPELLING

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>b</td>
<td>c</td>
<td>y</td>
<td>n</td>
<td>s</td>
</tr>
<tr>
<td>t</td>
<td>x</td>
<td>h</td>
<td>r</td>
<td>e</td>
<td>q</td>
</tr>
<tr>
<td>a</td>
<td>v</td>
<td>z</td>
<td>d</td>
<td>f</td>
<td>i</td>
</tr>
<tr>
<td>e</td>
<td>k</td>
<td>l</td>
<td>u</td>
<td>o</td>
<td>h</td>
</tr>
<tr>
<td>t</td>
<td>g</td>
<td>o</td>
<td>e</td>
<td>e</td>
<td>e</td>
</tr>
</tbody>
</table>

**E-Z SORT SYSTEMS INSTRUCTOCARD**
GRAMMAR & USAGE 

IMPROVING YOUR SPELLING
SHIRLEY B. BITTERLICH, Programer, GPTC
ROBERT K. BRANSON, Editor, GPTC
PAUL H. CARLSON, Programer, GPTC
WILLIE Y. HUFF, Programer, General Programed Teaching Corporation.

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2106 frames, paperback, 351 pp., 8-1/2" x 11", $ 
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 8th-11th graders. Field testing: Junior high students."
Prerequisites: None.
Average Time: 10 hours (based entirely on data).
Next Revision:
(2 sample pages)
## GRAMMAR & USAGE

### IMPROVING YOUR SPELLING
Bitterlich, Branson, Carlson, Huff; ENCYCLOPAEDIA BRITANNICA PRESS

2 sample pages:

<table>
<thead>
<tr>
<th>Page</th>
<th>Task</th>
<th>Correct Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>Mark out all incorrect spellings.</td>
<td>remember</td>
</tr>
<tr>
<td>56</td>
<td>Check all correct spellings.</td>
<td>remember</td>
</tr>
<tr>
<td>57</td>
<td>Check all correct spellings.</td>
<td>remember</td>
</tr>
<tr>
<td>58</td>
<td>She did not (remember/remember/remember) to mail the letter.</td>
<td>crowd</td>
</tr>
<tr>
<td>59</td>
<td>Write the correct letters.</td>
<td>examination</td>
</tr>
<tr>
<td>60</td>
<td>Mark out all incorrect spellings</td>
<td>mentioned</td>
</tr>
<tr>
<td>61</td>
<td>Write the correct letter.</td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mentioned</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>62</th>
<th>Underline all correct spellings.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>examination</td>
</tr>
<tr>
<td></td>
<td>examination</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>63</th>
<th>Mark out all incorrect letters and write the correct spelling.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>croude</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>64</th>
<th>Write the correct letters.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rfsfbr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>65</th>
<th>The speaker (mentioned/menabused/mentioned) the international situation.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>66</th>
<th>Mark out all misspellings.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>examination</td>
</tr>
<tr>
<td></td>
<td>evaluate</td>
</tr>
<tr>
<td></td>
<td>knowledge</td>
</tr>
</tbody>
</table>
GRAMMAR AND USAGE

MODERN ENGLISH SERIES: SPELLING RULES
LLOYD E. HOMME
DONALD T. TOSTI, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 2,990 frames, paperback, 612 pp.,
8 1/2" x 11", bound in 3 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program re-
usable, $12.50.
Teacher’s Manual: General Manual for all TMI-Grolier
programs available.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“8 year olds in 4th month of 3rd grade with average
IQ of 107.”
Prerequisites: “Third grade reading skill.”
Average Time: 12-24 hours (based entirely on data);
standard deviation, 4.2 hours.
Next Revision: June, 1963.
(3 sample pages)
### The Shun Sound is Often Spelled 

6. The shun sound is often spelled **tion**.

A story based on imaginary happenings is **fic**.

A double line under a letter(s) means to copy the letter(s).

### Test

7. A story based on imaginary happenings is called **fic**.

### Imaginary

8. A story based on **imaginary** happenings is called fiction.

### Choose the Right Letters

9. Choose the right letters:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ly</td>
<td>ey</td>
<td>ey</td>
<td>ry</td>
<td>ry</td>
</tr>
</tbody>
</table>

### Choose the Right Spelling

10. Choose the right spelling:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>fiction</td>
<td>fiction</td>
<td>fiction</td>
<td>fiction</td>
<td>fiction</td>
</tr>
</tbody>
</table>

1. fiction
Bashful

A camera takes pictures. John takes pictures with his new _______.

camera

A camera takes pictures.

camera

A camera takes pictures. Choose the right letters.
1. area
2. mera

2. mera

A _______ takes pictures.

camera
<table>
<thead>
<tr>
<th>Page</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>When a line is placed over a vowel, it shows that it has the ______ vowel sound.</td>
</tr>
<tr>
<td></td>
<td>long</td>
</tr>
<tr>
<td>32</td>
<td>The word bring comes ______ the word bottle in the dictionary!</td>
</tr>
<tr>
<td></td>
<td>test</td>
</tr>
<tr>
<td>33</td>
<td>When you add ed to ______, you get flapped.</td>
</tr>
<tr>
<td></td>
<td>flap</td>
</tr>
<tr>
<td>34</td>
<td>Perhaps means maybe. Find the misspelled word and spell it correctly ______</td>
</tr>
<tr>
<td></td>
<td>perhaps</td>
</tr>
<tr>
<td>35</td>
<td>When words have the same letter at the beginning, like job and jump, they are put in the order of their ______ letter.</td>
</tr>
<tr>
<td></td>
<td>second</td>
</tr>
</tbody>
</table>
GRAMMAR & USAGE

SPELLING DEMONS, I and II
EMANUEL BIERMAN, programer, assistant principal,
Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of
Technology
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95;
program not reusable, 500 frames in I, 500 in II,
I or II included in price of machine.

Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over 200."

Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)
GRAMMAR & USAGE

SPELLING DEMONS, I and II
Bierman, Schure; CENTRAL SCIENTIFIC
one sample page:

226. When everyone agrees in electing a new officer, he is elected by a unanimous vote.

STOP

227. Peter was elected by a unanimous vote as the class president.

STOP

228. There are syllables in unanimous.

STOP

229. Fill in the missing syllables:

unanimous

STOP

230. Add ly to unanimous to get unanimously.

STOP

231. Peter was elected unanimously by as the class president.

STOP

199
GRAMMAR & USAGE

SPELLING IMPROVEMENT 18
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 6480 frames, paperback, 216 pp.,
5" x 7", available in 6 separate units at $3.75 each.
For use in SPEED machine, program reusable, $60.00.
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 8 hours (est.).
Next Revision:
(1 sample page)

200
SPELLING DEMONS II

29. __________ are words that mean the same or have the same definition.

30. A synonym of resident is __________.

31. To break into someone's conversation is to __________ the conversation.

32. You will __________ the speaker is you ask a question while he is speaking.

33. It is impolite to __________ a conversation.

201
GRAMMAR & USAGE

SPELLING U-3007
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE, 510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).

Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade level - 2-6."
Other using population(s): "Jr. High school students, high school students and adults."
Prerequisites: None.
Average Time: 24 to 28 hours (est.).
Next Revision: August, 1963.
(2 sample pages)
### GRAMMAR & USAGE

#### SPELLING U-3007

Universal Electronics Laboratories Corporation;  
UNIVERSAL TEACHING MACHINE INSTITUTE

2 sample pages:

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Write the plural form of <strong>ox</strong> as it is used in the following sentences:</td>
<td>tares</td>
</tr>
<tr>
<td></td>
<td>The old man ____ broken toys.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>How write the plural of the following words:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>brush</td>
<td>brushes</td>
</tr>
<tr>
<td></td>
<td>dress</td>
<td>dresses</td>
</tr>
<tr>
<td></td>
<td>leaf</td>
<td>leaves</td>
</tr>
<tr>
<td>3</td>
<td>To form the plural, you added ____ to the words you have just written.</td>
<td>es</td>
</tr>
<tr>
<td>4</td>
<td>What should we add to <strong>gig</strong> to form the plural?</td>
<td>es</td>
</tr>
<tr>
<td>5</td>
<td>What is added to <strong>chick</strong> to form the plural?</td>
<td>s</td>
</tr>
<tr>
<td>6</td>
<td>Write the plural of each of the following</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rush</td>
<td>rushes</td>
</tr>
<tr>
<td></td>
<td>dog</td>
<td>dogs</td>
</tr>
<tr>
<td></td>
<td>mane</td>
<td>manes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Once you hear a _ when you say the plural of _y, it must be formed by changing the _ in _y and adding _y. Write the plural of _y.</td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Words that end in _y or _y and rhyme usually form their plurals in the same way. If the plural of _y is _y, then the plural of _y is _y.</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>Write the plurals of the following words.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>write, write, write</td>
<td></td>
</tr>
<tr>
<td></td>
<td>write, write, write</td>
<td></td>
</tr>
<tr>
<td></td>
<td>write, write, write</td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>What is the letter you hear before the _ when you say the plural of _? You form the plural, then, by adding _y, as in the sentence. Different religions have different beliefs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ch, ch, ch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ch, ch, ch</td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>Form two other words that will rhyme with _y.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ch, ch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ch, ch</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>Write the plurals for the following words.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>belief, chief, grief</td>
<td></td>
</tr>
<tr>
<td></td>
<td>belief, chief, grief</td>
<td></td>
</tr>
<tr>
<td></td>
<td>belief, chief, grief</td>
<td></td>
</tr>
</tbody>
</table>
FUNDAMENTALS OF POETRY,
FRANKLIN M. DICKEY, Subject Matter Expert
JAMES E. LEAVENWORTH, Programer, General Pro-
grammed Teaching Corporation
EDNA M. MORGAN, Editor, General Programmed
Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1050 frames, paperback, 325 pp.,
8-1/2" x 11", $2
Teacher’s Manual: “Instructions to teacher included in
preface.”
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental testing: Senior high school and college.
Field testing: Senior high school.”
Prerequisites: None.
Average Time: 9 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)
When we say, "make a pattern" we mean scan.

You scan these lines. (Make an iambic pattern. The first foot is trochaic.)

As for myself, I walk abroad a-nights
And kill sick people groaning under walls

(Here is a typical example of a trochaic substitution in a basically iambic line.)

This is a(n) ________ foot sign. "uui/

amp ______

anapestic

Scan (or make a pattern).

And we will some new pleasures prove

"uui/uui/uui/
And we /will some /new pleasures prove
THE MEANING OF MODERN POETRY
JOHN CLARK PRATT, Captain U.S. Air Force
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 339 frames, hard cover, 399 pp.,
8-1/4" x 5-3/8", $5.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education.
Additional Material Required: Dictionary (optional).
Average Time: 6-8 hours (est.).
Next Revision: “Dependent on publisher’s requirements.”
(1 sample page)
We have seen thus far how a person (a woman), an action (a salute), and a work of art (a painting) have led us into subjects of sexual love, dominion, and the relationship of art to life. In each case we have used the process of abstraction to arrive at the subject, starting with the occasion for the poem at the literal level, then proceeding to the pure idea behind it.

Let us look at another poem now, this one by Robert Frost. At first appearing deceptively simple, this poem is seen to be complex when studied carefully.

The Oven Bird
There is a singer everyone has heard,
Loud, a mid-summer and a mid-wood bird,
Who makes the solid tree trunks sound again.
He says that leaves are old and that for flowers
Mid-summer is to spring as one to ten.
He says the early petal-fall is past
When pear and cherry bloom went down in showers
On sunny days a moment overcast;
And comes that other fall we name the fall.
He says the highway dust is over all.
The bird would cease and be as other birds
But that he knows in singing not to sing.
The question that he frames in all but words
Is what to make of a diminished thing.

First, what type of poem is it?

It is a Shakespearean sonnet.

It is a sonnet.

It falls into no specific category, other than lyric.
POETRY: A CLOSER LOOK
JAMES M. REID, Harcourt, Brace & World
JOHN CIARDI, Saturday Review poetry editor
LAURENCE PERRINI, Dept. of English, Southern Methodist University
Published by HARCOURT, BRACE & WORLD,
750 Third Avenue, New York 17, New York

Programed text, 210 frames, paperback and hardcover,
128 pp., 6 1/4" x 9", $1.60 (paperback), $3.75 (hardcover).
Table of Contents, Index.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"1200 students in 33 schools and 4 colleges, involving 37 teachers."
Prerequisites: None
Average Time: "3 hours for programed section of 210 frames" (est.).
Next Revision: 1966
(1 sample page)
At the opening of Scene Three (stanza four), the man has two main things on his mind: (1) the impatience of the little horse and (2) the attraction of the loveliness, "dark and deep."

In the last three lines of stanza four, there appears still another problem for the speaker to face. To it Frost gives two names or descriptions: (1) "________ to keep" and (2) "________ to go before I sleep."

This new third question or problem refers to the original purpose of the driver's journey or errand. He has to decide whether to _______ on about his business or to linger by the woods.

In the fourth stanza the man makes his decision. Because he has _______ to keep," he _______ on his way.

Your second reading of the poem has carried you to a detailed understanding of a simple narration of a simple incident. This is one important kind of meaning. What you have grasped is the surface _______ of the poem. Closer reading will reveal some deeper meanings.

You have seen what happened in the poem. This narrative provides the surface meaning. The reader properly finds a certain measure of enjoyment in grasping this _______ _______ meaning.

Usually there is little difference of opinion or interpretation about a poem's surface meaning. But just as we expect to find deep water beneath the quiet surface of a lake, we may expect to find deeper or more profound meanings beneath the surface of a poem.
EFFECTIVE WRITING
LEIGHTON STEEL*
JANE STAPLEFORD
KELLOGG SMITH
ADRIENNE ZAHNISER, all of U.S.I. Educational Science Division
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 450 frames, hard cover, 8-1/4" x 5-3/8".

A similar program, IMPROVING YOUR WRITING, is available in TM format.
Published by EDUCATIONAL SCIENCE DIVISION, U.S. INDUSTRIES, Inc.,
250 Park Avenue, New York, New York
For use in AUTOTUTOR MARK II, $1,250; program reusable, $150.00.
Table of Contents, both programs; Index, programed text.
Unit Test(s) available, machine program.
Multiple Choice and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
College remedial (freshmen) English students.
Prerequisites: High school education.
Additional Material Required: Dictionary (optional).
Average Time: 12-15 hours (est.), programed text;
6-12 hours (est.), machine program.
Next Revision: Undetermined.
(1 sample page)

*Machine program only.
None of their plans are working out.

YOUR ANSWER: The sentence above is correct.

Right. None, like any, all, more, most, and some, takes a singular or a plural verb, depending upon the word to which it refers. In the sentence above, none refers to plans, and thus takes the plural verb are.

Here is another rule:

6. Collective nouns commonly take singular verbs.

Collective nouns (like herd, class, committee, crowd) take singular verbs because we think of them as acting as a unit. For example:

The class is bored.

We'll abide by what the committee decides.

Collective nouns do, however, take plural verbs when the parts or members of the collection are thought of as individuals.

For example:

The committee were always arguing among themselves.

Which of the following sentences is correct?

The number of such incidents has greatly decreased. [H]

If the government decide against war, the press will be disappointed. [G]

The basketball team are well trained in zone defense. [F]
PERSUASIVE WORDS
Effective Word Usage
HELEN KAIN, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

Use in HONOR TEACHINE MACHINE, $20 (approx.);
program reusable, 200 frames, $2.00-$2.50. (Machine
may be marketed in retail channels at this $20 com-
bination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice;
some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools."

Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)
# LANGUAGE ARTS

## PERSUASIVE WORDS

Kain; HONOR PRODUCTS COMPANY

one sample page:

<table>
<thead>
<tr>
<th>Feelings of dislike, hate, and disgust are negative feelings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of liking, love, and admiration are positive feelings.</td>
</tr>
<tr>
<td>Feelings that are neither positive nor negative are called neutral feelings.</td>
</tr>
</tbody>
</table>

Suppose that you like music; you have positive feelings about it. Then, you will probably also like words that have to do with music, like "song" or "melody." You will probably have feelings about the words "song" and "melody." When we associate a word with something that we like, the word takes on our positive feelings toward the thing that we like. When we associate a word with something that we dislike, the word often takes on our negative feelings toward the thing that we dislike.

Just as we have positive, negative, and neutral feelings about people, things, and events, we also have feelings toward words that we associate with people, things, and events. Such words are said to have positive, negative, and neutral associations for us. For instance, a word that we associate with something that we like is said to have positive associations for us. A word that we associate with something that we dislike is said to have negative associations for us.
PRINCIPLES OF DEBATE

PETER PROUSE, Subject Matter Expert
L. S. HARMS, Special Consultant
WAYNE T. ALCOCK, EDNA M. MORGAN, HENRY C. ELLIS, Programers, GPTC

MARK W. UTTON, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2000 frames, paperback, 250 pp., 8-1/2" x 11", $_____
Teacher’s Manual: *Instructions to teacher included in the preface.*
Table of Contents.
Final test available.

Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
*“High school and college students in Albuquerque, New Mexico; high school students in Roanoke, Virginia.”
Prerequisites: *“9th grade reading level.”
Average Time: 25 hours (based entirely on data).
Next Revision: Undetermined.
(2 sample pages)
**PRINCIPLES OF DEBATE**

Prouse, Harms, Alcock, Morgan, Ellis, Utton;
ENCYCLOPAEDIA BRITANNICA PRESS

2 sample pages:

<table>
<thead>
<tr>
<th>Question</th>
<th>Affirmative</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>57) Beginning with the First Affirmative Speaker, the teams alternate in giving constructive speeches. The second constructive speech is given by the First Speaker.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58) The third constructive speech is given by the (1) Affirmative Speaker, and the fourth, or last, constructive speech is given by the (2) Speaker.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59) The speaking order of the constructive speeches is (1) First Affirmative, (2) First Negative, (3) Second Affirmative, (4) Second Negative.</td>
<td>(1) First Affirmative</td>
<td>(1) Second</td>
</tr>
<tr>
<td>(Complete the answers)</td>
<td></td>
<td>(2) Second Negative</td>
</tr>
<tr>
<td>60) The speaking order of the constructive speeches is (1) First Affirmative, (2) First Negative, (3) Second Affirmative, (4) Second Negative.</td>
<td>(1) First Affirmative</td>
<td>(1) First Negative</td>
</tr>
<tr>
<td>61) In making rebuttal speeches, the teams alternate beginning with the Negative team. The first constructive speech is made by the (1) Speaker, but the first rebuttal speech is made by the (2) Speaker.</td>
<td>(1) First Affirmative</td>
<td>(1) First Negative</td>
</tr>
<tr>
<td>62) The first of the four rebuttal speeches in a debate is made by a member of the Negative team.</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>63) Beginning with the First Negative Speaker, the teams alternate in giving rebuttal speeches. The second rebuttal speech is given by the (1) Speaker.</td>
<td></td>
<td>First Affirmative</td>
</tr>
<tr>
<td>64) The third rebuttal speech is given by the (1) Negative Speaker, and the fourth, or last, rebuttal speech is given by the (2) Speaker.</td>
<td>(1) Second</td>
<td>(1) Second Affirmative</td>
</tr>
</tbody>
</table>
49) The first speech in a debate is made by the (1) Speaker. The debater who speaks immediately thereafter is the (2) Speaker.

50) The third speech in a debate is (1) speech made by the (2) Speaker.

51) The fourth and final constructive speech in a debate is made by the (1) Speaker.

(1) \( \text{constructive} \)

(2) \( \text{rebuttal} \)

52) Of the eight speeches made in a debate, the first four are called (1) speeches and the last four are called (2) speeches in which the speaker tries to rebuild his team's arguments.

53) Each speaker's second speech is his (1) speech, in which he tries to (2) his team's arguments after they have been attacked.

54) Each speaker's first speech is his (1) speech.

55) The second speech made by the Second Affirmative Speaker is his (1) speech.

(1) \( \text{rebuttal} \)

56) None of the rebuttal speeches are made until all of the (1) speeches have been completed.

(1) \( \text{constructive} \)
A PROGRAMED INTRODUCTION TO LINGUISTICS:
Phonetics and Phonemics
CYNTHIA D. BUCHANAN, programer with
Sullivan Associates
Published by: D. C. HEATH and Co.,
285 Columbus Ave., Boston, Mass.

Programed text, 1212 frames, 270 pp., 8 1/2" x 11", soft
bound, $5.00.
Table of Contents.
Unit Test(s) available.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Hollins College: undergraduate and graduate students.
N.D.E.A. Summer language institute at Converse
College: language teachers.

Prerequisites:
Average Time: 14 hours (based entirely on data).
Next Revision:
(1 sample page)
PHONEMICS

All speech sounds differ from each other. We note some of the differences between speech sounds and disregard others. Apparently, we notice the differences in sounds which are capable of changing the meaning of an utterance.

Functional Differences

We will call the differences between sounds which are capable of changing the meaning of an utterance FUNCTIONAL differences.

Is the difference between [p'] and [b'] a functional difference?

The difference between [t'] and [t] is the presence or absence of aspiration/voicing.

Non-Functional Differences

If a speaker pronounces TIP first with an aspirated, and then with an unaspirated "t," e.g., [t'ip'], [tip'], does the meaning of the word change?

[tip'] would sound odd, because we aspirate initial voiceless stops, but no difference in meaning results.

In English, presence or absence of aspiration changes the meaning of an utterance.
STUDENTUTOR LIBRARY OF MATCHING EXERCISES
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn St., Cambridge 38, Mass.

For use in STUDENTUTOR, program reusable, 360 frames, programs supplied in kit which contains 5 machines and 18 scrolls, $45.00.
Teacher's Manual available, free with kit.
Table of Contents.
"Items in program itself may be used for diagnostic purposes."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Kindergarten children tested one at a time under supervision. Materials were tested in teaching machines.
Average Time: 5 hours (est.).
Next Revision: Fall, 1963.
(1 sample frame)
LANGUAGE ARTS

STUDENTUTOR LIBRARY OF MATCHING EXERCISES
Technical Staff; GENERAL EDUCATION
one sample frame:

READING READINESS:
q c d p q g b j

PHONIC TRAINING:
f

NUMBER CONCEPTS:
two
THE BASAL PROGRESSIVE CHOICE READING PROGRAM.
MYRON WOOLMAN
RUTH ANN DAVY
LOUISE RAMIREZ
MARCIA WOOLMAN
PATTI LOWERY
ALLEN PETERSON, all of Institute of Educational Research.
Published by: THE INSTITUTE OF EDUCATIONAL RESEARCH, Inc.,
2226 Wisconsin Avenue, N.W., Washington 7, D.C.

Programmed text, 400 frames, Paperback, 428 pp., 8 1/2"x11"
Developmental editions available at $1.00 per segment.
Teacher's Manual available.
Table of Contents.
Diagnostic Test(s) available.
Some Constructed Responses, Multiple Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"500 mentally retarded children in 33 classes, taught by 33 different teachers. Children's ages: 6-18;
I.Q. range: 20-80. Pre and Post Testing by Metropolitan Achievement Test in Reading and Progressive Choice Marginal Diagnostic Reading Test.
Prerequisites: Reading level less than 2.0 at start of program.
Average Time:
Next Revision:
(1 sample frame)
LANGUAGE ARTS

THE BASAL PROGRESSIVE CHOICE READING PROGRAM
Woolman, Davy, Ramirez, Woolman, Lowery, Peterson;
THE INSTITUTE OF EDUCATIONAL RESEARCH
one sample frame:

H H H H

H H H H E

H H E

H

H

H
HOW TO IMPROVE YOUR READING
JANE BOYD LARIMORE, Programer, Learning Incorporated
WILLARD ABRAHAM, Dept. of Educational Services,
Arizona State University
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 300 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
constructed Responses usually used; some multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Data incomplete as of February 8, 1963."
Prerequisites: Grade 7 reading ability.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in Summer, 1963."

(1 sample page)
**LANGUAGE ARTS**

**HOW TO IMPROVE YOUR READING**

Larimore, Abraham; CORONET INSTRUCTIONAL FILMS

one sample page:

**Example 1**

George was always short of money, but he was too

*timorous* to ask his boss for a raise.

**2.6** The sentence in which a word is used is the context

of that word. Read Example 1. We can call the sentence

in which *timorous* is used, the context.

**2.7** Word recognition is one of the steps toward reading

improvement and one of the aids to this step is

context.

**2.8** Look at Example 1. Try to recognize the meaning

of *timorous* by its context. *Timorous*

means

context.

**2.9** The sentence in which a word is used is the

context of the word.

Example 2

Sarah is so *phlegmatic* that she is always the last

person finished with her work.

**2.10** Read Example 2. Use the context to help you

recognize the meaning of *phlegmatic*. *Phlegmatic*

means

context.

**2.11** You can use the context of a word to help you

recognize the meanings of unfamiliar words.
MODERN ENGLISH SERIES: FIRST STEPS IN READING
A Programed Reading Primer
L. BENJAMIN WYCKOFF
JOHN FULLILOVE
POLO C. DE BACA
THEODORE S. STRANCZEK
PATRICIA J. ANDREGO, all of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

For use in MIN/MAX II machine, $25.00; program reusable,
2,500 frames $10.00.
Teacher’s Manual: General Manual available for all
TMI-Grolier programs.
Table of Contents.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Students age 6 years 1 month to 9 years 11 months,
average age 7 years 0 months.”
Prerequisites: “Elementary motor skills with pencil.
Ability to comprehend simple instructions.
Average Time: 15-35 hours (based entirely on data);
standard deviation, .84 hours.
(2 sample pages)
LANGUAGE ARTS

PROGRAMMED READING
CYNTHIA DEE BUCHANAN, Sullivan Associates
Published by McGRAW HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, paperback, 144 pp., 8 1/4" x 11",
$_____.
Teacher's Manual available.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
- Prerequisites:
- Average Time:
- Next Revision:
(1 sample page)
no
This is Sam. Is Sam sitting? yes
no

no
Is this Sam? yes
no

Nip
This is N__p.

Nip
Sam pats Nip.
Tab.

230
READER

Charles Williams, Programmer
Published by Publishers Co.,
1106 Connecticut Avenue, N.W., Washington, D.C.

For use in TeachAll machine, $69.95; program reusable,
800 frames, included in cost of machine, additional
800-frame programs, $24.95.

Teacher's Manual included.
Table of Contents.
Unit, Final, Diagnostic Test(s) available.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

Developmental (Field Test) Population(s):
"Elementary levels."
Prerequisites:
Additional material required: TeachAll machine,
$69.95.
Average Time: 1/2-1 hour (est.).
Next Revision: "New courses ready about Feb. 15, 1963."
(1 sample page)
READING UNIT 1

1

box

2

box

mother
doll

mother
box
cake

READING UNIT 1

3

box

READING UNIT 1

4

cat

box
cat

sun
LANGUAGE ARTS

REMEDIAL READING
A Set of 16 Automated Workbooks
Prepared through the facilities of THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

Programed workbooks, 2016 frames, paperback, 18 pp. in each book, 7” x 11”. “Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.

For use in DEVEREUX TEACHING AID - MODEL 50, $89.50, program reusable.
Teacher’s Manual available, $1.00.
Table of Contents.
Unit Test(s) available; coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: “Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is the ability to write, so physically handicapped can and do use them.”

Additional material required: Devereux Teaching Aid - Model 50, $89.00. Some developmental material available on the Graflex Instructor machine.
Average Time: “Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days.”

Next Revision: September, 1963.
(1 sample page)
Many of us like to find seashells on the beach. Where do they all come from? They are the houses of shellfish which have been washed up on the beach by the water. Shellfish are soft little animals which live inside of these shells. They do not look like the fish we know but do have eyes, a mouth and other things like a fish. Some shellfish have a foot to help them move. Others fasten themselves to one place and stay there.

<table>
<thead>
<tr>
<th>What are seashells?</th>
<th>How do shellfish move?</th>
</tr>
</thead>
<tbody>
<tr>
<td>little pieces of rock</td>
<td>with feet</td>
</tr>
<tr>
<td>the houses of starfish</td>
<td>with arms</td>
</tr>
<tr>
<td>the houses of shellfish</td>
<td>with a foot</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How do shells get on the beach?</th>
<th>Do all shellfish move in the water?</th>
</tr>
</thead>
<tbody>
<tr>
<td>they live there</td>
<td>yes</td>
</tr>
<tr>
<td>water washes them there</td>
<td>no</td>
</tr>
<tr>
<td>air moves them there</td>
<td></td>
</tr>
</tbody>
</table>

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STEPS TO BETTER READING, Book One
WILBUR SCHRAMM, Institute for Communication Research,
Stanford University
HERBERT POTELL, New Utrecht High School, Brooklyn,
New York.
GEORGE D. SPACHE, Reading Laboratory and Clinic,
University of Florida.
Published by HARCOURT, BRACE & WORLD,
750 Third Avenue, New York 17, New York.

Programed text, 808 frames, paperback, 176 pp.,
6 3/4" x 9 1/8", $1.72.
Teacher’s Manual available.
Table of Contents.
Unit and Final Test(s) available, included with book or
$.40 when ordered separately.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"About 100 pupils in three different schools."
Prerequisites: "None, except being in Grade 7."
Average Time: 20 hours (est.).
Next Revision: 1968.
(1 sample page)
14. Parentheses and commas aren't the only signals that the author is giving us a definition of an unfamiliar word. Look at this sentence:

"The pilot looked again and again at his altimeter—a little dial that told him the height of his plane above the ground."

Here the signal that a definition of altimeter follows is the punctuation mark called a _______.

15. Let's see what we can learn about the context of altimeter. We learn from the sentence in Step 14 that an altimeter is a little _______ that the pilot looks often.

16. The pilot looks often at his altimeter because it tells him how high or far his plane is flying above the ground.

17. All this information is to be found in the text that goes with the unfamiliar word or, as we call it, the _______ of the word.

18. "The pilot looked again and again at his altimeter—a little dial that told him the height of his plane above the ground."

In this case the definition of altimeter comes immediately following the word and is set off by a _______.

19. You have learned three punctuation signals telling you that a definition may be expected immediately after an unfamiliar word. When the author explains the meaning of the unfamiliar word, he sometimes sets off the definition by _______. Sometimes by _______. Sometimes by _______.

20. "Modern jet engines have tremendous thrust, the force that pushes the airplane forward."

In this sentence the definition of thrust is signalled by a _______.

21. "You can often determine the meaning of a word from its context in the text that goes with it."

In this case the signal that context is going to be defined by _______.

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BEGINNING SIGHT VOCABULARY
THORWALD ESSENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 945 frames, edge-punched cards,
105 "lesson units," $174.65.
Teacher's Manual available, included with program
Table of Contents, Index.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Primary classes and upper primary with reading
difficulties."
Other using population(s): "Used with remedial readers
and with mentally retarded students."
Prerequisitess: None
Average Time: 30 hours (est.).
Next Revision: "Unknown."
(2 sample pages)
BEGINNING SIGHT VOCABULARY
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.
2 sample pages:

BASIC SIGHT VOCABULARY   INCORRECT RESPONSE
BUILDING WORDS
Structural Analysis of Words
RENATE LEPEHNE, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.);
program reusable, 200 frames, $2.00-$2.50. (Machine
may be marketed in retail channels at this $20 com-
bination price including 3 or 4 programs.)
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)
A port or harbor is a place where goods are brought in (or into).

The word in serves many purposes and undergoes many changes. Not only may it be used as a word by itself, but it also may be used as a prefix. When used as a prefix, the n is changed to m before words beginning with p. Using these facts, write port and in as one word in the sentence below:

If we bring things into a country, we __________ them.

Import may be used as both a noun and as a verb. When used as a verb, import is pronounced im-port. When used as a noun, import is pronounced im-port.

We not only import things, we also carry things out of the country. For the words out, out of, and away from there is another prefix: ex.

If Mortimer Wordstock, a United States businessman, wants to sell his goods in European countries, he has to __________ them.

It turns out that Mr. Wordstock wants to __________ to Europe, soapflakes manufactured in his factory in Cincinnati.

Another word in the port family may be used to say that Mr. Wordstock wants to carry the boxes of soapflakes across the country to the ship in the port of New York.

Here is a good clue: the new prefix is trans, which means across.

Therefore, if you carry things across the country, you __________ them.

If, on the other hand, Mr. Wordstock himself goes to Europe, he will bring back news and stories to his partner, or he will again bring out the news and stories of his trip.

The prefix meaning back or again is re. Therefore, Mr. Wordstock will bring back news and stories to his partner, or he will __________ the news and stories.
LANGUAGE ARTS

DAVID DISCOVERS THE DICTIONARY
NANCY GRANIERI WILLFORD, Programer, Learning Incorporated
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois

Programed text, 300 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Data incomplete as of February 8, 1963."
Prerequisites: 4th grade reading level.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in Summer, 1963."

(1 sample page)
DAVID DISCOVERS THE DICTIONARY
Willford; CORONET INSTRUCTIONAL FILMS
one sample page:

7-1 Cecil was confused when Miss James told the class that one word could have four or five definitions. She explained that you can only one at a time.

7-2 Miss James explained it this way. A word you read in a sentence has only one definition. The same word in a dictionary may have many definitions. To understand the sentence, you must decide which of the word has been used.

7-3 Henry looked up the entry "fly" in the dictionary.
fly (fli), 1. an insect, 2. motion through the air with wings.
The entry above has two definitions. Read the sentence below:
"The small bird could not fly."
This sentence uses ___ definitions of "fly".

7-4 All the definitions of a word cannot be used in the same sentence. Read all the definitions of "horse" below:

horse (hɔr), 1. the animal shown in the picture, 2. a supporting frame, 3. a piece of gymnasium equipment.

"You can pet a horse and feed it sugar." This sentence uses definition number ___ of "horse".

7-5 Look at definition number 3 above. You do not pet or feed sugar to this kind of horse. A horse is also a piece of gymnasium ___.

7-6 "The carpenter put the board across a horse before he cut it." This sentence uses definition number ___.

7-7 You use the dictionary to choose which __ of a word has been used in the sentence.
For use in STUDENTUTOR with Variprompter window, program reusable, 840 frames, programs supplied in kit which contains 5 machines and 18 scrolls. $45.00
Table of Contents.
“Items in program may be used for diagnostic purposes.”
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Materials are based on research studies reported in Israel, M. L., Variably Blurred Prompting: I. Methodology and Application to the Analysis of Paired-Associate Learning, The Journal of Psychology, 1960, 50, 43-52.”
Average Time: 9 hours (est.).
Next Revision: Fall, 1963.
(1 sample page)
ORNAMENTAL
(adj) Decorative; used to add beauty. Hats are often not for warmth, but are merely ornamental.
LANGUAGE ARTS

VOCABULARY BUILDING I and II
EMANUEL BIERMAN, Programer, assistant principal,
Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of
Technology
Published by CENTRAL SCIENTIFIC COMPANY,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95;
program not reusable, 500 frames in I and 500 in II,
I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice
Responses; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)
VOCABULARY BUILDING II

8. John's lethargic behavior convinced his mother he was ill. John was (spirited, sluggish, bored).
   ___________________________________________________ sluggish

9. A synonym is a word that means the same as another word. A synonym for lethargic is (in a stupor, sorrowful).
   ___________________________________________________ in a stupor

10. To be sluggish is to be ____________________________
    __________________________________________________ lethargic

11. The original meaning of lethargic was forgetful. The Greek work leth means_____________________
    __________________________________________________ forgetfulness

12. To be homesick is to be ____________________________
    To be sluggish is to be ____________________________
    __________________________________________________ nostalgic, lethargic
VOCABULARY GROWTH

Divide and Conquer Words

MARTA ZABORSKA, Programer, Learning Incorporated
JAMES COFFROTH, Instructor of Journalism and Publications, South Mountain High School, Phoenix, Arizona

Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 339 frames, paperback, 57 pp., 7” x 10”, $1.20.
Teacher’s Manual included.
Test Set included.
Constructive Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

“...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 5 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 8th through 12th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated.”

Other Using Population(s): “Subjects as low as grade 7.”

Prerequisites:
Average Time: 2 hours, 18 minutes (based entirely on data); standard deviation, 32.8 minutes.

Next Revision: “The published program is the final revision.”

(1 sample page)
9-5 The magnate looked at the magnet with a magnifying glass. In this sentence the word which does not refer to greatness in any way is (9).

9-6 In the word *magnitude* the root meaning great is (9).

9-7 *Magnitude* means (9).

9-8 *Magnitude* means size and importance. Besides (9) ness.

9-9 *magnitude* = size, greatness, importance. Write the meaning which fits best in the following phrases:

a) a decision of great *magnitude* or (9)

b) a building of great *magnitude* or (9)

c) the *magnitude* or (9) of his generosity.
WORD CLUES
Be a Word Detective
B. JEAN ANWYLL, Head Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.);
program reusable, 200 frames, $2.00-$2.50. (Machine
may be marketed in retail channels at this $20 com-
bination price including 3 or 4 programs.)
Constructed Responses used sometimes; some Multiple
Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)
In each example, the restatement was a clue to the meaning of the new word, and the restatement was found right after a semicolon.

You are now on your way to becoming a word detective. One clue that alerts a word detective is the semicolon because it often introduces a restatement.

San's OOPAS set the class to laughing.
An "OOPAS" is:
- a. an eight-legged animal.
- b. a musical instrument.
- c. There are not enough "clues" in the context to tell.

Press and hold the button of your choice. Do not be disturbed if you skip some of the material.

San's OOPAS set the class to laughing.
An "OOPAS" is:
- a. "An eight-legged animal"?
  I'd say I caught you guessing!
- b. "A musical instrument"?
  Remember, I made up the word "OOPAS." Are there really enough clues in the context to tell what it means?
- c. You're right!
  There aren't enough clues in the context to tell what "OOPAS" means.
WORD CLUES

STANFORD E. TAYLOR, President, Educational Developmental Labs
HELEN FRACKENPOHL, Educational Developmental Labs
ARTHUR S. MCDONALD, Director of Reading Services, Marquette University
NANCY JOLINE, Staff Associate, Educational Developmental Labs

Published by EDUCATIONAL DEVELOPMENTAL LABORATORIES, Inc.,
284 Pulaski Road, Huntington, New York

Programmed text, 310 frames (in each book), paperback, 176 pp., 8-1/2” x 11”, $1.80.
Teacher’s Manual available, $.30.
Index.
“Three equated tests are available which may be used as initial, medial, or final tests,” $.25 per copy.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Schools in Milwaukee area and on Long Island.”
Other using population(s): “Capable sixth grade students have used the seventh and eighth grade books.”
Prerequisites: “Need to be reading on at least sixth grade level.”

Average Time: 10-12 hours (est.).
Next Revision: 1-2 years.
(1 sample page)
An introductory frame sets the stage for the lesson to follow. Each of the ten words is then developed in three frames as follows:

**FIRST FRAME**

| 1a | Write a definition or comment. |
|    | Washington is a city in which many wonderful things are happening. |

**SECOND FRAME**

| 1b | Another word for others: |
|    | a. block |
|    | b. act |
|    | c. but |
|    | d. talk |

**THIRD FRAME**

| 1c | Check the sentence in which the word is used correctly. |
|    | a. Please write down the words. |
|    | b. He wrote the words down on the wall. |
|    | c. The words were written on the wall. |
|    | d. The words written on the wall. |

(First frame for next word)
WORDS
A Programed Course in Vocabulary Development
SUSAN MEYER MARKLE, Education Dept., University of California at Los Angeles.
Published by SCIENCE RESEARCH ASSOCIATES, Inc.,
259 East Erie Street, Chicago 11, Illinois.

Programed text, 2200 frames, paperback, 224 pp.,
8 1/2" x 11", $1.40 (quantity discounts).
Teacher's Manual available, $.35, free with 25 or more
Text booklets.
Table of Contents.
Unit, Final, Diagnostic Test(s) available.
Constructed Responses usually used; some Multiple Choice Responses; some Branching; some Double Tracking.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grades 4-9"
Prerequisites:
Additional equipment required: (dictionary listing is a self-contained unit within the program.)
Average Time: 40 hours (based entirely on data).
Next Revision: September, 1965.
(2 sample pages)
## Language Arts

### Words

Markle; SCIENCE RESEARCH ASSOCIATES

2 sample pages:

<table>
<thead>
<tr>
<th>Chapter Seven</th>
<th>Chapter Seven</th>
</tr>
</thead>
</table>
| 52. b (If you said “no,” there are several possible reasons.) | 52. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 53. b This (The negative prefix is the first one.) | 53. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 54. b In | 54. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 55. b first or at the beginning or in front | 55. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 56. b negative | 56. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |

### Part B

| 57. b dehumanize | 57. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 58. b demobilized | 58. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 59. b opposite (“Antonyms” is also correct.) | 59. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 60. b negative | 60. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |
| 61. b humanized (Things are better now.) | 61. INCOMPLETE  
Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the negative prefix in each word? Why? |

---

**Part B**

| 57. b dehumanize | 57. In the word dehumanized the prefix de- comes first and the prefix human- comes second. Which is the negative prefix? |
| 58. b demobilized | 58. In the word demobilized, the prefix de- comes first and the prefix mobil- comes second. Which is the negative prefix? |
| 59. b opposite (“Antonyms” is also correct.) | 59. In the word opposite, the prefix opposite- comes first and the prefix opposite- comes second. Which is the negative prefix? |
| 60. b negative | 60. In the word negative, the prefix negative- comes first and the prefix negative- comes second. Which is the negative prefix? |
| 61. b humanized (Things are better now.) | 61. In the word humanized, the prefix human- comes first and the prefix human- comes second. Which is the negative prefix? |

---

**Part B**

| 57. b dehumanize | 57. In the word dehumanized the prefix de- comes first and the prefix human- comes second. Which is the negative prefix? |
| 58. b demobilized | 58. In the word demobilized, the prefix de- comes first and the prefix mobil- comes second. Which is the negative prefix? |
| 59. b opposite (“Antonyms” is also correct.) | 59. In the word opposite, the prefix opposite- comes first and the prefix opposite- comes second. Which is the negative prefix? |
| 60. b negative | 60. In the word negative, the prefix negative- comes first and the prefix negative- comes second. Which is the negative prefix? |
| 61. b humanized (Things are better now.) | 61. In the word humanized, the prefix human- comes first and the prefix human- comes second. Which is the negative prefix? |
### Chapter Seven

#### Part D

<table>
<thead>
<tr>
<th>95. in</th>
<th>95. The word indisposed has four parts. The first prefix is __________. The second prefix is __________. The root is __________. to is a __________.</th>
</tr>
</thead>
<tbody>
<tr>
<td>96. in</td>
<td>96. In the word indisposed the negative prefix is __________ because it comes __________.</td>
</tr>
<tr>
<td>97. put away</td>
<td>97. The definition of the parts of dispose is __________.</td>
</tr>
<tr>
<td>98. dispose</td>
<td>98. Suppose something you no longer want is worth money. A sale is one way of getting rid of something, or of &quot;putting it away&quot; for good. You can __________ of something by selling it.</td>
</tr>
<tr>
<td>99. un</td>
<td>99. When someone means &quot;throw away&quot; or &quot;sell,&quot; it is negated by the prefix __________, not by __________.</td>
</tr>
<tr>
<td>100. undisposed of</td>
<td>100. A used car that has been sitting on the salesman's lot (for months) is a car that is __________ disposed of.</td>
</tr>
<tr>
<td>101. no</td>
<td>101. A newspaper headline says: PRESIDENT KENNEDY WAS INDISPOSED. Was anyone trying to &quot;sell&quot; or &quot;throw away&quot; Mr. Kennedy? __________.</td>
</tr>
</tbody>
</table>

**Note:** Use this panel for Items 102-109 (keep in view from No. 102 to No. 109).

A. The picture was still undisposed of.
B. President Kennedy was indisposed.
C. Henry was indisposed to accept my plan.

<table>
<thead>
<tr>
<th>102. A</th>
<th>102. In each of the three sentences above, there is a negation of parts. In which of the sentences does the word undisposed mean &quot;sold&quot; or &quot;thrown away&quot;? Sentence __________.</th>
</tr>
</thead>
<tbody>
<tr>
<td>103. no</td>
<td>103. In Sentence A, undisposed means &quot;not gotten rid of.&quot; In Sentence B, no one tries to get rid of Mr. Kennedy, so indisposed can't mean &quot;not gotten rid of.&quot; What about Sentence C? Could indisposed mean &quot;not gotten rid of&quot; in that sentence? Would it make sense? __________.</td>
</tr>
</tbody>
</table>
MODERN LANGUAGE

ELEMENTARY FRENCH

MARY K. RICKERT, Programer, General Programmed Teaching Corporation
BETTY LOU C. DUBOIS, Editor, General Programmed Teaching Corporation

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425-N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2385 frames, paperback, 477 pp., 8-1/2" x 11", $...
Teacher's Manual: "Instructions to teacher included in the preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High school and college students in Albuquerque, New Mexico; high school students in Roanoke, Va."

Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision: 1968.

(2 sample pages)
Translate into English:
Est-ce que Marie et elle parlent français?
Mais oui, elles parlent français.

Is je parle an infinitive?
Répondez en français.

Circle the en which does not have the nasal sound |

Match Pierre with the correct pronoun.

Pierre elle
Substitute Pierre for il in the sentence: Il parle française.

To pronounce e in femme, gently place the tongue against the lower teeth, lower the jaw slightly and say a.

Practice this French sound [a] by repeating the words below.

The French word parler means to speak.

Write to speak in French.

Write in French without using est-ce que: Peter and my son are speaking English. Is she speaking English?

The French word pronounced [par le] which means to speak is ________.
MODERN LANGUAGE

FRENCH (ELEMENTARY)
CLT French Series I (No. 46-12-03)
EDWARD M. STACK, Dept. of French, The American University, Washington, D.C.
Published by ELECTRONIC TEACHING LABORATORIES, 5034 Wisconsin Avenue, N.W., Washington 16, D.C.

For use in LANGUAGE LABORATORY, program reusable, 2340 frames, $79.95.
Teacher's Manual available; $1.25.
Table of Contents, Index.
Unit test (s), "integral part of program.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prérequisites:
Additional material required: Minimum requirement:
tape recorder.
Average Time: 10 hours (est.).
Next Revision:
(1 sample page)
MODERN LANGUAGE

FRENCH (ELEMENTARY)
Stack; ELECTRONIC TEACHING LABORATORIES
one sample page:

SAMPLE FRAMES (from tapescript) CLT French (Series I)

1. STIMULUS  La femme est intelligente. Et l’homme ?
    RESPONSE  (timed pause for student answer)
    MASTER    L’homme est intelligent.
    REINFORCEMENT (timed pause for repetition)

2. STIMULUS  La jeune fille est charmante. Et le garçon ?
    RESPONSE  (timed pause for student answer)
    MASTER    Le garçon est charmant.
    REINFORCEMENT (timed pause for repetition)
FRENCH I
Short-Cut in Vocabulary Building
OGUZ R. TURKKAN, President of LFI
Mrs. J. BOUCHER, Consultant, Board of Education, N.Y.C.
Published by LEARNING FOUNDATIONS INSTITUTE, Inc.
271 North Avenue, New Rochelle, N.Y.

For use in LEARNATRON MK II $495.00
A/Z MARK I AND II $89-189
THE MINIK $4.95-14.75
Program reusable, 106 frames, $2.00-20.00

Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"International Camp and Children's Colony (Lakeville, Conn.): advanced students and teachers' training camp."
Other using population(s): Adult beginners.
Prerequisites:
Average Time: 2 hours (est.).
Additional Material required: "Tape Recorder desirable, not necessary; (we supply a Transistorized Tape Recorder - The "Miny."

Next Revision: 1964.
(1 sample page)
MODERN LANGUAGE

FRENCH I
Turkkan, Boucher; LEARNING FOUNDATIONS INSTITUTE

one sample page:

[Image of a sample page with a grid of exercises and instructions in French.]
MODERN LANGUAGE

FRENCH PHONETICS
ELIANE BURROUGHS, French Dept., Hollins College
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago Il, Illinois

Programed text, 1,000 frames, paperback, 170 pp.,
8-1/2" x 11-1/2", $7.70.
For use in TEMAC BINDER, $1.75; program reusable,
$5.95.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"College students at Hollins College; high school
students at Roanoke City Public Schools."
Prerequisites: "Basic vocabulary of at least 300 French
words."
Additional material required: Tape recorder or language
laboratory. Three single tapes—$42.30 per set.
Average Time: 16 hours for average students (est.).
No Revision.
(1 sample page)
In the following sentences underline the "e" [e] which must be pronounced:

1. Je ne répond pas.
2. Elle ne répond pas.

Note: Remember that the graphemes "e" do not represent any consonant sound but ONLY the vowel [e].

—

1. Je ne répond pas.
2. Elle ne répond pas.
3. Il ne dit pas.
4. Elle ne sait pas.

When a [e] is preceded by several consonant sounds it is pronounced. It is pronounced also when it is followed by the combination consonant plus a vowel.

—

When a [e] is pronounced in rapid speech a double consonant sound sometimes occurs. Listen to the word "boue" [bu] in rapid speech. The "e" [e] is not pronounced and a double [u] occurs.

—

To pronounce a double consonant sound such as [b] [d] [l] [m] and [j], hold your breath for a brief pause before the consonant.

1. Je déclare.
2. Nettoyer.

Repeat the words and note the differences that occur in rapid speech. The "e" [e] is pronounced when a [e] occurs in the future form of certain verbs to mark the difference from the present tense.

—

A double consonant sound occurs when a [e] is dropped in rapid speech. A double [r] occurs in the future form of certain verbs to mark the difference from the present tense. Repeat the words sentence by sentence and note the differences that occur.

—

Note: To pronounce a double [p] [t] [k] [b] [d] [l] and [n] there is a slight break in the flow of sound before the consonant. To pronounce any other double consonant, the pause is held a little longer and the consonant is lengthened.

—

Programmed Student Manual for French Phonetics

265
FRENCH TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JOHN V. GORMLEY, Instructor
JEAN FREMONT, Instructor
Published by GRAFICROLL SYSTEMS, Inc.
4215 Calavo Drive, La Mesa, California

Programed text, 975 frames, paperback, 242 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in French to English.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
(1 sample page)
**Correspondence**

1. Unlike the United States, in France you can buy stamps in a tobacco shop. If you do need a post office, you ask—Le bureau de poste, la poste. (leh burodeh post, la post) or in English ___ ___ ___.

<table>
<thead>
<tr>
<th>1-the post office</th>
<th>2-The post office in French is Le bureau de __, la __.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>2-poste poste</th>
<th>3-Parcel post is pronounced Le colis postal (leh koli postal). Parcel is English for the French ____, and colis postal is ____.__.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3-colis parcel post</th>
<th>4-If you wish to send a parcel, you would say—&quot;Je veux envoyer ce colis&quot;, this is the same as—&quot;I want to send this ____.&quot;</th>
</tr>
</thead>
</table>

---

267
MODERN LANGUAGE

BASIC GERMAN VOCABULARY
HALMUTH H. SCHAEFER
CHARLES B. FERSTER, both of Institute for Behavioral Research
Published by PROGRAMMED TEACHING AIDS, Inc.
3810 South Four Mile Run Drive, Arlington, Virginia.

Programmed text, 1,586 frames, 131 pp., 8 1/2"x11".
$3.00.
For use in FERSTER TUTOR, under $5.00, program re-usable.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
27 graduate students, 3 high school students, 4 undergraduate students, 1 secretary, 1 housewife.
Prerequisites:
Average Time: 50 hours (based entirely on data). Standard deviation, 10 hours.
Next Revision:
(1 sample page)
MODERN LANGUAGE

BASIC GERMAN VOCABULARY
Schaefer, Ferster; PROGRAMMED TEACHING AIDS
one-sample page:

1. It takes a Knabe and a girl to fall in love.
2. When Washington was a little Knabe he lied.
3. When I was a little one I wore knee pants.
4. Snips and snails and puppy dog's tails,
that's what a little boy is made of.
5. "Those awful Blumen," said Rensa who had hayfever.
"Sie sind schöne Blumen, not awful at all" said his Schwester who had no hayfever.

499. "Du bist ein schöner Student!" said the General full of sarcasm to his rocket expert.

500. "Du bist ein schöner Student, getting all F's." Maybe you see it now, but don't write anything down yet

501. "Du bist ein schöner Student, getting all F's."

502. A famous sarcastic line from Gilbert and Sullivan is:
"What a schöner state of things!"

503. Translate as far as you can:
"Rome student you are, getting all F's."
MODERN LANGUAGE

GERMAN A

DR. ERNEST E. ELLERT, Colorado State University
Published by ENCYCLOPAEDIA BRITANNICA PRESS
425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 5,050 frames, paperback,
8 1/2" x 11 1/2", $33.75. Bound in 10 separate
sections.

For use in TEMAC BINDER, $1.75; program reusable,
$32.00.

Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

"Students at Hollins College and Roanoke Public
Schools."

No special prerequisites.

Additional material required: Tape recorder or language
laboratory and tapes accompanying the program.

Price of tapes - $115.00 for a set of 12

Average Time: 120 classroom hours (est.).

No Revision.

(1 sample page)
The words of a language are combinations of sounds. When you speak English, you use English sounds. When you speak German, you will use German sounds.

German and English are related languages. Thus they have many similar sounds, but they also have some different sounds.

The sounds of English are divided into two groups: vowels and consonants. The sounds of German are also divided into vowels and consonants.

We use the letters of the alphabet to represent English sounds. We will use the same letters to represent German vowels that we do to represent English vowels.

But these letters will always represent the same sounds that they do in English.
MODERN LANGUAGE

GERMAN TRAVATUTOR

JAC D. MEACHAM, Director, Universal Learning Division,
RUTH H. COOVER, Instructor
MARIANNE C. BUSCH, Instructor
Published by GRAFICROLL SYSTEMS, Inc.
4215 Calavo Drive, La Mesa, California

Programed text, 1010 frames, paperback, 247 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in German to English.

Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."

Prerequisites: None
Average Time: 10 hours (est).
(1 sample page)
1. The letter *a* in English is pronounced eight (8) different ways. In German, we are concerned with only two types of sounds. The **LONG** *a* and the **SHORT** *a*. The long *a* is one of the German sounds for the letter *a*.

2. The **LONG** *a* in German can also be spelled *aa* or *ah*. The long *a* in German is pronounced like the *a* in father and the *a* in *dame* (*lady*), haben (*have*), *haar* (*hair*) in the language.

3. The **SHORT** *a* in German is the sound of *ah* as in pot or like the *a* in artistic. The sound of the short *a* in German is like: *mann* (*man*), *anna* (*Anne*), *ball* (*ball*), and *das* (*the*). The *a* is quicker in sound than in the long *a*.

4. The German language, unlike the English, has only **two** types of sounds for the letter *a*. The **LONG** and the **SHORT** *a*.
MODERN LANGUAGE SERIES - BASIC GERMAN READING
DONALD TOSTI
NIRAM A. WILSON, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,643 frames, paperback, 740 pp.,
8 1/2” x 11”, bound in 3 separate volumes, $16.00.
For use in MIN/MAX II machine, $25.00; program reusable,
$15.00.
Teacher’s Manual: General Manual for all TMI-Grolier
programs available.
Final Test included.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Thirteen year olds through adults.”
Prerequisites: “Requires ability to read and follow
simple instructions in English.”
Average Time: 17-30 hours (based entirely on data);
standard deviation, 3.5 hours.
Next Revision: June, 1963.
(3 sample pages)
Which of these below is correct for "You (they) will (to) go"?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Sie (sie) wird gehen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Sie (sie) werde gehen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Sie (sie) werden gehen.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Germ:  

Which of these below is correct for "I shall (to) understand"?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Ich werde verstehen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Ich werde verstehten.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Ich wird verstehten.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Ich werde verstehten.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Germ:  

Which of these below is correct for "We shall (to) come"?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Wir werden kommen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Wir werde kommen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Wir werden kommen.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Germ:  

Which of these below is correct for "He (she) will give"?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Er (er) wird geben.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Er (er) werde geben.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Er (er) werde geben.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Er (er) werden geben.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Germ:  

German: Sie (sie) werden verstehten.  
Sound: Zee (see) VEHR-deh fren-SHTAY-ehn.  
Meaning: You (they) will (to) understand.  
You (they) will understand. (Copy all sentences.)
<table>
<thead>
<tr>
<th></th>
<th>German: Wie geht es Ihnen?</th>
<th>German: Wie geht es Ihnen?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means: How goes it (with) you? (How are you?)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Means: How goes it (with) you? (How are you?)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The German word &quot;geht es&quot; means</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The German word &quot;Ihnen&quot; means</td>
<td></td>
</tr>
<tr>
<td></td>
<td>goes it (with) you</td>
<td></td>
</tr>
</tbody>
</table>

<p>|   | German: 1. 2. 3. |
|   | German: Sound |
|   | 1. &quot;w&quot; is always sounded as &quot;v&quot; as in &quot;verv.&quot; |
|   | 2. &quot;w&quot; is always sounded as &quot;v&quot; as in &quot;wee.&quot; |
|   | &quot;w&quot; is sounded |
|   | vee |
|   | Which word below is the correct sound for &quot;how&quot;? |
|   | Which word below is the correct German word for &quot;how&quot;? |
|   | boe vee wie |
|   | vee wie |
|   | 1-23 |</p>
<table>
<thead>
<tr>
<th>66</th>
<th>German:</th>
<th>Meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Menschen:</td>
<td>Herr (her) name Schmidt. (Her (his) name is Schmidt.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>67</th>
<th>German:</th>
<th>Meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Wir heißen Koch. 2. Heißt er Müller?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>68</th>
<th>German:</th>
<th>Meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wir heißen Koch. (Our name is Koch.) 2. Name der Müller? (Is their name Müller?)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>69</th>
<th>German:</th>
<th>Meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Ich muß gehen. 2. Er (sie) muß sehen.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>70</th>
<th>German:</th>
<th>Meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Ich muß (zu) gehen. 2. Er (sie) muß (zu) gehen. (I must go.) (He (she) must go.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

277
MODERN LANGUAGE SERIES: MODERN HEBREW: 
BASIC READING
RABBI MAX LEADER
DONALD BERTHOLOMEY, Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

Programmed text, 2,541 frames, paperback, 528 pp.,
8 1/2" x 11", bound in 2 separate units, $16.00.
For use in MIN/MAX II machine, $25.00; program
reusable, $15.00.
Teacher's Manual: General Manual for all TMI-Grolier
programs available.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"8-15 year olds, 3-10th grade students."
Prerequisites: "Requires an ability to read and write
elementary English."
Average Time: 17-25 hours (based entirely on data);
standard deviation, 2.63 hours.
(2 sample pages)
MODERN LANGUAGE

MODERN LANGUAGE SERIES: MODERN HEBREW:
BASIC READING
Leader, Bertholomey; TEACHING MATERIALS CORP.
2 sample pages:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Observe is a letter.</td>
<td>BOTH</td>
</tr>
<tr>
<td>The three dots under the letter are called a vowel. Which is a vowel?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Which is a vowel?</td>
<td>BOTH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>is a vowel that has the sound of &quot;ah.&quot;</td>
<td>BOTH</td>
</tr>
<tr>
<td>Kaf and , have the sound of ______.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) &quot;kah&quot;</td>
<td>2) &quot;kah&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Every Hebrew letter, unless it comes at the end of a word, must have a vowel. Which example follows this rule?</td>
<td>BOTH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Notice that under the letter Sin 3 in 278 in the vowel . Choose the vowel.</td>
<td>BOTH</td>
</tr>
</tbody>
</table>

279
Which is Vext?

Vext has the sound of the English letter:
1) a 2) h 3) oh 4) v

How would you pronounce "x"?
1) "veh" 2) "leh" 3) "oh" 4) "uh" 5) "eh"

"x" is pronounced "veh" because a Hebrew letter is always pronounced before the vowel that goes with it.

Which letter in "xx" does not have a vowel?
1) 2) 3) 4) v

280
ITALIAN TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JOSEPHINE REID, Instructor
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 900 frames, paperback, 230 pp.,
5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75;
program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in Italian to English.
Table of Contents.
Final Test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None.
Average Time: 10 hours (est.).
(1 sample page)
## Colors

1. The color blue in Italian is **blu** (bloo) and quite similar to the English blue. Black is **nero** (nay row). The water is ____ (blue) and the dirt is ____ (black).

<table>
<thead>
<tr>
<th>1 - blu, nero</th>
<th>2 - If you wanted to buy a red and blue shirt you would ask for--<strong>rosso</strong> (red) and ____. Rosso is red and <strong>blu</strong> is blue. ____ is black.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - blu, nero</td>
<td>3 - White in Italian is <strong>bianco</strong> (bee yonk koh). The U.S. flag is ____ (red), ____ (white), and ____ (blue).</td>
</tr>
<tr>
<td>3 - <strong>rosso</strong> bianco blu</td>
<td>4 - The colors that we have covered thus far are: ____ , ____ , ____ , and ____ .</td>
</tr>
</tbody>
</table>
MODERN LANGUAGE

JAPANESE TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
YASUKO KAJII, Instructor
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 1075 frames, paperback, 263 pp.,
5 1/2" x 8", $9.95.

Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language.”

Prerequisites: None
Average Time: 10 hours (est.).
(1 sample page)
### Money of Japan

#### 1. The dollar-to-yen conversion rate is $1.00 to ¥360.00.
   - The ¥ is the Japanese sign for money and is the equivalent to our $ (dollar) sign.

#### 2. The kinds of yen currency in circulation are: 1,000, 500, 50, 100, 10, and 5 ¥ bank notes. If you had 3,600 yen, you would have: ______ in U.S. dollars.

#### 3. The coinage used in Japan are in denominations of: ¥50, ¥10, ¥5, and ¥1. The coins are used very little since if you had ¥5, you would have only ___¢ in U.S. money.

#### 4. When entering Japan you should convert your dollars to ___(¥) and when leaving Japan reconvert your ___(¥) to dollars.
MODERN LANGUAGE JR. H.S.

MODERN LANGUAGE SERIES: BASIC RUSSIAN READING
LLOYD E. HOMME
NJRAM A. WILSON, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

Programed text, 1,994 frames, paperback, 402 pp.,
8 1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program
reusable, $10.00.
Teacher's Manual: General Manual for all TMI-Grolier
programs available.
Final Test included.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Twelve year olds through adults."
Prerequisites: "Requires an ability to read and write
elementary English."
Average Time: 18-20 hours (based entirely on data).
(2 sample pages)
MODERN LANGUAGE SERIES: BASIC RUSSIAN READING
Homme, Wilson; TEACHING MATERIALS CORPORATION
2 sample pages:

---

M: hotel?
---

S: goSTEEnette?
M: hotel?
---

S: goSTEEnette?
M: hotel?
---

S: GYEEnette? (COPY)
M: hotel?
---

S: GYEEnette?
M: ___ hotel?
---

S: goSTEEnette where
M: ___
They will speak Russian.
MODERN LANGUAGE

WRITING RUSSIAN SCRIPT
A Self-Instructional Program.
IRVING J. SALTZMAN, Dept. of Psychology, Indiana University
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 2,000 frames, paper cover, 400 pp.,
8 1/2" x 11", $3.95.
Table of Contents.
Final Test included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High school and college students, adults."
Prerequisites: "Must be able to read and write English."
Additional equipment required: "Tape recorder and taped material, optional."
Average Time: 10.5 hours plus 1.5 hours on tape (est.).
Next Revision:
(1 sample page)
IN RUSSIAN SCRIPT, THE SMALL LETTER "YAH" (lığa) IS CONNECTED WITH THE SMALL LETTERS WHICH PRECEDE IT AND FOLLOW IT IN THE FOLLOWING MANNER:

NOTICE THAT THE SMALL BOOK I ALWAYS PRECEDES AT THE BEGINNING OF "YAH," JUST AS "TIH" "ELI" AND "EM."

***

From each of the following pairs, select the item indicated, check your response and then make a copy of the correct item.

Q1-224: мяч in script.
1) мяч - 2) мяч
A1-224: 1)

Q4-224: шум in script.
1) шум - 2) шум
A4-224: 2)

Q6-224: Write: мяч
A6-224: мяч
Copy this if your answer is wrong.

Q7-224: Write: облак
A7-224: облак
Copy this if your answer is wrong.

R-Q1: Are the following letters in their correct alphabetical order: чшьи

R-A1: Yes.
MODERN LANGUAGE

AUTOMATED SPANISH

DELBERT L. BARCUS, Supervising Teacher, Denver Public Schools.

Published by DENVER PUBLIC SCHOOLS,

414 14th Street, Denver 1, Colorado

Programmed text, 2016 frames, paperback, 291 pp., 8-1/2" x 11", 3 separate units @ $1.50 each.

Final Test available, 2 forms, $.10 per copy.

Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "6 to 20 individual trials preliminary to research study using 6000 sixth graders in the Denver Public Schools."

Prerequisites: "Fifty to seventy-five hours of audio-lingual training in Spanish."

Average Time: 21,039 hours (based entirely on data with a standard deviation of 4,926 hours).

Next Revision:

(2 sample pages)
245. señora 246. Este es el sitio y él se llama.

246. señor 247. José tiene dos hermanos.
Una se llama Alberto;
uno se llama Federico.

247. se llama 248. Alberto no tiene hermanos.
Alberto tiene hermanos.

248. tiene 249. ¿Cuántos hermanos tiene Alberto?
Alberto tiene hermanos.

249. tiene 250. Alberto no tiene tres hermanos;
tiene sólo dos.

250. hermanos 251. Los hermanos se llaman José
y Federico.

251. hermanos 252. Hay tres niños y dos niñas.
252. niñas
253. No hay tres niños: hay ___ niños.

254. dice
255. ¿Tiene Alberto dos her? ___ Sí.

256. hermanos
257. Hay un niño: hay tres ___.

258. niñas
259. ¿Cuántos a___ de hay? ___ Tres.

259. niños
260. ¿Cuántos niños hay? ___ cuatro niños.

261. hay
262. ¿No hay una niña? No, hay dos ___.

263. niños
264. Esta ___ tiene cuatro ventanas.
MODERN LANGUAGE

INTRODUCTORY SPANISH
M. W. SULLIVAN, President, Sullivan Associates
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 3,284 frames, paperback, 1,250 pp. (7 units), 8-1/2" x 11-1/2", $18.00 plus Binder.
For use in TEMAC BINDER, $1.75; program reusable; $18.00.
Teacher’s Manual included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Hollins College students, Roanoke City Public School students.”
Prerequisites: “No special prerequisites.”
Additional material required: Tape recorder or language laboratory and accompanying tapes—$64.75.
Average Time: 45 hours (est.).
No Revision.
(1 sample page)
11. Fill in the missing word:
   The table is pretty.
   La \underline{_____} es muy bonita.

12. The Spanish adjectives for BLACK, WHITE, PRETTY, etc., end in ______ when they modify masculine nouns, and in ______ when they modify feminine nouns.

13. Answer the question:

Check your answer.

14. Ask the question:

\textbf{Is the table black?}

Check.

Now answer the question. Check.
MODERN LANGUAGE JR. H.S.

MODERN LANGUAGE SERIES: BASIC SPANISH

JAMES L. EVANS
RAFAEL VALDES, both of Teaching Materials Corp.

Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

Programed text, 3,480 frames, paperback, 837 pp.,
8 1/2" x 11", bound in 3 separate volumes, $17.50.
For use in MIN/MAX II machine, $25.00; program
reusable, $16.50.

Teacher's Manual: General Manual available for all
TMI-Grolier programs.

Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Eighth, ninth, tenth and eleventh grade students with
no prior studies or background in the subject."

Prerequisites: "Requires ability to read and follow simple
instructions in English."

Average Time: 30 hours (based entirely on data); standard
deviation, 5.24 hours.

(3 sample pages)
MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC SPANISH
Evans, Valdes; TEACHING MATERIALS CORPORATION
3 sample pages:

<table>
<thead>
<tr>
<th>Page</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>817</td>
<td>To form the plural of most words ending in a vowel, add</td>
</tr>
<tr>
<td>818</td>
<td>To words ending in consonants, add</td>
</tr>
<tr>
<td>819</td>
<td>The plural of “corder” is</td>
</tr>
<tr>
<td></td>
<td>The plural of “corderas” is</td>
</tr>
<tr>
<td>820</td>
<td>To words ending in , add “-as” to form the plural.</td>
</tr>
<tr>
<td>821</td>
<td>To words ending in , add “-es” to form the plural.</td>
</tr>
<tr>
<td>822</td>
<td>The word “-es” in Spanish (“-es” next to a vowel) may be “-as” or</td>
</tr>
<tr>
<td></td>
<td>depending on whether you are “broken” or “proper.”</td>
</tr>
</tbody>
</table>

296
"Twenty-two" is "ventisiete." "Twenty-three" is _______.

Add the Spanish words for "two," "three," "four," "five," and "six" to "venti-" to form "ventii," "ventiii," "ventiv," "ventivi," and "ventivi."  

"Twenty-four" is not "ventuestra," but _______.

(Que hora es?)

Son las diez y _______.

(Que hora es?)

Son las cinco menos _______.
MODERN LANGUAGE  Jr. H.S.-Coll.

SPANISH A
First Year Course in Spanish
STANLEY M. SAPON, Professor of Psycholinguistics,
University of Rochester
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 6,602 frames, paperback, 8-1/2" x 11-1/2", $29.25 including Binder.
For use in TEMAC BINDER, $1.75; program reusable, $28.50.
Teacher's Manual included.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Ohio State University students."
Prerequisites: "Reading ability of seventh grade or above."
Additional material required: Tape recorder or language laboratory and tapes accompanying the program—$200.00 for 21 tapes.
Average Time: 50-85 hours (est.).
No Revision.
(1 sample page)
1. You are looking at frame number 1. It contains some instructions, and an underlined space to write your answers.

The underlined space is used to write down your answer.

Write in the word that would complete the sentence above, and pull the lower mask down to the next solid line at the margins.

1. answers

(After you pull the top mask down to meet the line below, you will be ready to go on to frame number 2. You expose frame number 2 by pulling the lower mask down to the solid lines at the margins.)

2. (If you followed the instructions, frame number 1 and its answer frame are no longer visible. The top mask should be above the printed number 2 at the left, and the bottom mask should be at the solid lines at the margins. If the masks are not properly set, flip them now.)

After you are told something in a frame, you will either answer a question or complete a sentence. In either case, you will find a line on which to write your answer.

2. answer (or answers)

(Cover up both parts of frame number 2, and proceed to the next frame.)

3. The purpose of the answer frame is to let you know immediately whether your answer is right or wrong.

3. right

4. Sometimes instead of writing out an answer, you will have to make a mark in a space like this: [ ]. Here is a question for you to answer:

When do you look at the answer frame, before or after you write your answer?

[ ] before [ ] after

4. [ ] after

5. When you reach the last frame on a page, you will find marks like this: ???

This means that you are to bring both masks to the top of the page, lift the masks slightly, and flip the page back. Once you have done this, you will be ready to expose the next frame.

5. frame

???

???
MODERN LANGUAGE

SPANISH (ELEMENTARY)
CLT Spanish, Series I (No. 16-12-04)
CHARLES I. FOLTZ, author
Published by ELECTRONIC TEACHING LABORATORIES,
5034 Wisconsin Avenue, N.W., Washington 16, D.C.

For use in LANGUAGE LABORATORY, program reusable,
2400 frames, $89.95.
Teacher's Manual available, $1.25.
Table of Contents, Index.
Unit test(s), integral part of program.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: Minimum requirement:
tape recorder.
Average Time: 12 hours (est.).
Next Revision: (1 sample page)
SAMPLE FRAMES (from tapescript) CLT Spanish (Series I)

1. STIMULUS  Yo sigo el taxi. Y ellos?
      RESPONSE  (timed pause for student response)
      MASTER    Ellos siguen el taxi.
      REINFORCEMENT (timed pause for repetition)

2. STIMULUS  Come Ud. carne?
      RESPONSE  (timed pause for student response)
      MASTER    Si, yo como carne.
      REINFORCEMENT (timed pause for student response)
MODERN LANGUAGE

SPANISH U-3002
UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION
Published by UNIVERSAL TEACHING MACHINE
INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program
reusable, 2160 frames, machine and program,
$25.00 (school discount).

Table of Contents.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade Level - 8-12."
Other using population(s): Adult.
Prerequisites: None
Average Time: 30 to 36 hours (est.).
Next Revision: August, 1963.
(2 sample pages)
MODERN LANGUAGE

SPANISH U-3002
Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>452</td>
<td>The word <strong>tarn</strong> is pronounced <strong>tah</strong>.</td>
<td><strong>BAH</strong></td>
</tr>
<tr>
<td>454</td>
<td>The word <strong>sa4</strong> is pronounced <strong>sah</strong>.</td>
<td><strong>bob</strong></td>
</tr>
<tr>
<td>455</td>
<td>The Spanish word <strong>marn</strong> is pronounced <strong>man</strong>.</td>
<td><strong>SAY</strong></td>
</tr>
<tr>
<td>456</td>
<td><strong>KAHN</strong>-kah is spelled <strong>ka</strong> in Spanish.</td>
<td><strong>cante</strong></td>
</tr>
<tr>
<td>457</td>
<td>The Spanish word <strong>SAH-keh</strong> is pronounced <strong>keh-kah</strong>.</td>
<td><strong>bey</strong></td>
</tr>
<tr>
<td>458</td>
<td><strong>KEE</strong>-kah is spelled <strong>ke</strong> in Spanish.</td>
<td><strong>give</strong></td>
</tr>
</tbody>
</table>

304
| 463 | In the Spanish language, ___ is the meaning similar definite article. |  |  | el |
| 464 | The article ___ means the. El means ___ in Spanish. |  |  | the |
| 465 | The Spanish word ___ means the. |  |  | el |
| 466 | In Spanish, ___ libros means the book. The phrase ___ libros means ___ book. |  |  | the |
| 467 | The phrase ___ libros means the book. |  |  | el |
| 468 | El libro means ___ |  |  | the book |
MODERN LANGUAGE

SPANISH TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JAMES M. HARDISON, Instructor, Writer
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 850 frames, paperback, 210 pp.,
5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75;
program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program
reusable, $15.00.
Program also available in Spanish to English.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple
Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen,
families, tourists, travelers or anyone interested
in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
(1 sample page)
The "A" in Spanish is pronounced like the response given to the doctor when he says--"Open your mouth and say --ah". Now say -ah each time the letter a appears in the following words: casa, mama, papa, pasa, la, da.

Now modify the a with the respective consonants and say --"Papa pasa la casa" (Father passes the house).

Let's try another one. "Papa da la casa a mama" (Father gives the house to mother).

In Spanish a is always pronounced the same, regardless of where it appears in a word.

The a in Spanish is pronounced----

(Select one of the following statements)

---as in the english words: day, say, and may. ... turn to Page 3

---as in "ah" when responding to a doctor asking you to open your mouth for a look at your throat.

... turn to Page 2
MATHEMATICS-ALGEBRA

ADVENTURES IN ALGEBRA (TutorText)
NORMAN A. CROWDER,
GRACE C. MARTIN, both of U.S.I., Educational Science
Division
Published by DOUBLEDAY & CO., Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 336 frames, hard cover, 348 pp.,
8 1/4" x 5 3/8", $4.95.
A similar program, INTRODUCTION TO ALGEBRA
(TutorFilm), available in TM format.
For use in AUTOTUTOR MARK II, $1,250; program re-
usable, 410 frames, $40.00.
Table of Contents, Index.
Unit Test(s) included.
Programed text available in Japanese.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisite:
Average Time: 6-8 hours (est.).
Next Revision: "Not scheduled."
(1 sample page)
YOUR ANSWER: If \( x + a = 0 \), \( x = -a \).

You are correct. If we wish to solve any equation of the form \( x + a = 0 \), where \( a \) is a known number and \( x \) is the unknown, we can proceed as follows:

\[
x + a = 0
\]

Subtract \( a \) from both sides:

\[
x + a - a = 0 - a
\]

\( a - a = 0 \), so

\[
x + 0 = -a
\]

\[
x = -a
\]

If we had begun with the equation \( x - a = 0 \), we would have

\[
x - a = 0
\]

Add \( a \) to both sides:

\[
x - a + a = 0 + a
\]

\[
x = a
\]

Now, as we said at the beginning of this lesson, in solving an equation such as \( x - a = 0 \) or \( x + a = 0 \), we want to deduce from our original equation one in the form "\( x = \) some number." When we have a term such as \( a \) either added or subtracted from our unknown, \( x \), what rule will summarize the calculations above and enable us to get rid of the troublesome \( a \) on the left-hand side of the equation?

Move the \( a \) to the other side of the equation and change its sign.  
Move the \( a \) to the other side and put a minus sign in front of it.  
Move the \( a \) to the other side.

C  
B  
A
MATHEMATICS – ALGEBRA

ALGEBRA I
DANIEL P. MURPHY, Teaching Fellow State University of Iowa.
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 8,200 frames, paperback, 1,290 pp., 8-1/2" x 11-1/2", $13.25. Available in 5 separate units @ $3.25 each.
For use in TEMAC BINDER, $1.25; program reusable, $12.00.
Teacher’s Manual available, $.50.
Table of Contents.
Unit Test(s) available. More than one equivalent form of test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Selected groups, Roanoke City Public Schools."
Other using population(s): "Adult education groups; review."
Prerequisites: "No special student prerequisites other than those required for normal ninth grade algebra."
Average Time: 135 classroom hours for average students (est.).
No revision of this particular program. New programs in ninth grade algebra will be developed.

(1 sample page)
Now we shall return to the problems. Refer to page 163.

If \( x \) represents the number, what represents the number increased by \( x^2 \)?

If \( x \) represents the number, how would you represent the product of the number \( x \) and the number increased by four? \((x + 6)^2\)

The product of a certain number and the number increased by four is \(-3\). According to the problem, \( p \) is \((-3)\). Write an equation stating this equality.

If \( x \) is the number, the equation which represents the problem \( x^2 + 4x = -3 \). Transpose all terms on \( x \) to make the right number equal to 0. Factor the equation and find the roots.

\[ x^2 + 4x + 3 = 0 \]
\[ (x + 3)(x + 1) = 0 \]
\[ x + 3 = 0 \]
\[ x = -3 \]
\[ x + 1 = 0 \]
\[ x = -1 \]

Roots: \(-3, -1\)

Since we have two roots, we have two possible answers for our problem. Let us check \( x = -1 \). The product of this number \((-1)\) and the number increased by \( 4(x + 6) \), is \(-3\). Therefore, the answer checks. Now let us check \( x = -3 \). Is the product of \(-3\) and \(-3\) increased by \( 3 \) equal to \(-37?\)

Refer to page 164. If \( x \) represents the number, how would you represent the product of a certain number and the number increased by \( 7^2 \)?

Let \( x \) represent the number. Refer to page 164. Write the equation which states the fact of the problem.

\[ p = x + 7 \]
\[ \]
MATHEMATICS—ALGEBRA

ALGEBRA II
ROBERT J. TITIEV, Britannica Center for Studies in Learning
Published by ENCYCLOPEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 6,750 frames, paperback, 1,036 pp.,
8-1/2" x 11-1/2", $13.25. Available in 5 separate
units @ $3.25 each.
For use in TEMAC BINDER, $1.25; program reusable,
$12.00.
Teacher's Manual available, $2.50.
Table of Contents.
Unit Test(s) available $1.60 per copy. More than one
equivalent form of test available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Naive groups from the Roanoke City Public Schools;
field test population classrooms from Roanoke City
Public Schools, Roanoke, Virginia.”
Other using population(s): “Adult education, professional
review.”
Prerequisites: “No special prerequisites other than reading
ability approximating ninth grade level.”
Average Time: 120 classroom hours for average students
(est.).
No expected revision.
(1 sample page)
MATHEMATICS – ALGEBRA

ALGEBRA II
Titlev; ENCYCLOPAEDIA BRITANNICA PRESS
One sample page

4096. Now refer to Figure 106. Remember that the function
\(-x^2 + 12x\) represented the product of two real numbers whose sum
is 12. We have found that the product is a maximum when
\(x = 6\)

4097. Therefore, since the two numbers that we wanted to find
were represented by \(x + 6\) and \(-x\), we know that the solution to the
problem will be the numbers _____ and _____

4098. By graphing a function, we have found that the product of
\(6\) and \(6\) is greater than the _____ of any other two numbers
whose sum is 12

4099. Look at Figure 106 once again. We see that the graph of
\(y = -x^2 + 12x\) crosses the X-axis at the point whose x-coordinate
is 0, and also at the point whose x-coordinate is _____

4100. Since the y-coordinate of every point on the X-axis is 0,
we know that the function \(-x^2 + 12x\) will be equal to 0 whenever
the graph crosses or touches the X-axis

4101. We know that the graph of \(-x^2 + 12x\) crosses the X-axis
at \(x = 0\) and at \(x = 12\). Therefore, \(-x^2 + 12x = 0\) when
\(x = 0\) and when \(x = 12\)

4102. We know that the roots of a function will be equal to 0
whenever the _____ of the function crosses the _____ axis

4103. We know that the graph of \(-x^2 + 12x\) crosses the X-axis
at \(x = 0\) and at \(x = 12\). Therefore, \(-x^2 + 12x = 0\) when
\(x = 0\) and when \(x = 12\)

4104. Since the function \(-x^2 + 12x\) is equal to 0 when \(x = 0\) and
\(x = 12\), we know that \(x = 0\) and \(x = 12\) are two solutions to the equa-
tion \(-x^2 + 12x = 0\)

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MATHEMATICS – ALGEBRA

ALGEBRA I and II
PROFESSOR KRAKOW, programer
MARTIN MEO, New York University
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95;
program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over 200."
Prerequisites: None.
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)
MATHEMATICS – ALGEBRA

ALGEBRA I and II
Krakow, Meo, Schure; CENTRAL SCIENTIFIC CO.
one sample page

ALGEBRA II

3. $16a^3b^3$ is called a ____________
   \[ \text{monomial} \]

4. $15a^2 + 9b^2 + 8c + d^3$ is called a ____________
   \[ \text{polynomial} \]

5. When we multiply a polynomial by a monomial we first multiply all the terms of the polynomial separately by the monomial and then combine the resulting products using the correct sign.

6. Let's work a sample problem. To multiply $16r + t$ by $2r$ we begin by rewriting the expression as we would an arithmetical multiplication.$16r + t$
   \[ \text{corRECT} \]

   Our first step is multiplying $16r \cdot 2r$ giving ____________
   \[ 32r^2 \]
MATHEMATICS-ALGEBRA

ALGEBRA 11
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 15,200 frames, paperback, 540 pp.,
5" x 7", available in 15 separate units at $3.75 each.
For use in SPEED machine, program reusable, $152.00
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $10.00 per unit.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Arithmetic
Additional material required: SPEED teaching machine
$700 & $850.
Average Time: 30 hours (est.).
Next Revision:
(1 sample page)
MATHEMATICS-ALGEBRA

ALGEBRA 11
Coursey; EDUCATION ENGINEERING, Inc.

one sample page

If a letter or letters has no coefficient written before it, the coefficient 1 is understood.

For example, in is the same as a because multiplying a number by 1 does not change its value.

In the product ab:
the coefficient of ab is 1.
the coefficient of a is b.
the coefficient of b is a.

What do we mean by the coefficient 1 is understood? We mean that even though it is not written down, we know it is there.

QUESTIONS
1. What is the coefficient of xy in the product xy?
2. What are the prime factors of 16?
3. What are the prime factors of Day?
4. What is the coefficient of x in the product Day?
5. What is the coefficient of aways in the product aways?

ANSWERS
1. y
2. 1
3. 2, 2, 2, x and y
4. 4 and 4
5. x
6. 2, 4, x and y
7. 3
8. 2y
9. xwy
10. 2, 2, 2 and 3

317
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade Level - 8-12."
Other using population(s): "Adult."
Prerequisites: None
Average Time: 36 to 45 hours (est.).
Next Revision: August, 1963.
(2 sample pages)
**MATHMATICS – ALGEBRA**

**ALGEBRA U-3001**

Universal Electronics Laboratories Corporation; UNIVERSAL TEACHING MACHINE INSTITUTE

2 sample pages

<table>
<thead>
<tr>
<th>Step</th>
<th>Equation</th>
<th>Next Step 1</th>
<th>Next Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>430</td>
<td>( x + 0 = -6 )</td>
<td>Add ( -6 )</td>
<td>Add ( x )</td>
</tr>
<tr>
<td>440</td>
<td>( x = -6 )</td>
<td>Add ( x ) and ( -6 )</td>
<td>Add ( x )</td>
</tr>
<tr>
<td>441</td>
<td>( x = -6 )</td>
<td>Add ( x ) and ( -6 )</td>
<td>Add ( x ) and ( -6 )</td>
</tr>
<tr>
<td>442</td>
<td>( x + 0 = -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
</tr>
<tr>
<td>443</td>
<td>( x + 0 = -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
</tr>
<tr>
<td>444</td>
<td>( x + 0 = -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
<td>Add both ( x ) and ( -6 )</td>
</tr>
</tbody>
</table>

The solution is \( x = -6 \)
### 467. Addition in Algebra

Addition in algebra is roughly similar to addition in arithmetic.

| A negative number plus a negative equals a negative number. |
|---|---|
| A positive number plus a positive equals a positive number. |

#### 468. If we add a negative and a positive number, and, if the negative number is larger, then the sum of the two numbers will be a negative number. |

#### 469. If we add a positive and a negative number, and, if the positive number is larger, then the sum of the two numbers will be a positive number. |

#### 470. A positive number plus a positive number equals a positive number. |

#### 471. Now let's solve for \( x \) in this equation:

\[
+3 \cdot x + (-2 \cdot -2) + (-3 \cdot -1) + (-6 \cdot -2)
\]

Our general rule for solving for \( x \) is to get \( x \) by itself on one side.

#### 472. First, we'll do the obvious addition problems on each side, to shorten the equation.

<table>
<thead>
<tr>
<th>On the left side:</th>
<th>On the right side:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( +3 \cdot x + (-2 \cdot -2) + (-3 \cdot -1) )</td>
<td>( +(-6 \cdot -2) )</td>
</tr>
</tbody>
</table>

We then have \( +2 \cdot x + (9 \cdot -1 \cdot -1) \)
ALGEBRAIC EQUATIONS
LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER,
$2.95; 100 frames.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Planned population of 100."
Prerequisites:
Average Time: 3 hours (est.).
Next Revision: September, 1963.

(1 sample page)
28. Use division to change an equation so that it can be used simultaneously with another equation.
First set of equations
\[ 9A - B = 31 \] leave unchanged \[ 9A - B = 31 \]
\[ 92A - 23B = 253 \] divide by 23
\[ \frac{92A}{23} - B = \frac{253}{23} \]
Complete equation
\[ 4A - B = \frac{253}{23} \]

29. Solve for \( A \) by subtraction
\[ 9A - B = 31 \]
\[ 4A - B = 11 \]
Complete equations
\[ 5A = 20 \]
\[ A = 4 \]

30. Another problem: Machines \( J \) and \( K \) make the same product, but the machine \( K \) is older and slower. With 3\( J \) and 2\( K \) machines, 7 finished products can be made per hour. Write the equation.
Complete equation
\[ 3J + 2K = 7 \]
MATHEMATICS - ALGEBRA

EQUATIONS AND INEQUALITIES
EUGENE D. NICHOLS
ROBERT KALIN
HENRY GARLAND, all of Florida State University.
Published by: HOLT, RINEHART & WINSTON,
383 Madison Ave., N. Y. 17, N.Y.

Programed text, 284 frames, paperback, 80 pp., 7" x 10",
$.96.
Teacher's Manual available, $.16.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grades 7 thru 12."
Prerequisites: "Four fundamental operations with
directed numbers."
Average Time: 3-9 hours (est.).
Next Revision: Unknown.
(1 sample page)
MATHEMATICS - ALGEBRA

EQUATIONS AND INEQUALITIES
Nichols, Kalin, Garland; RINEHART & WINSTON
one sample page

77 If Writeall writes 5 in place of □ in
10 □ + 4 = 9,
does he obtain a true or false statement?

STOP

77 False

78 If Writeall writes 4 in place of □ in
10 □ + 4 = 9,
does he obtain a true or false statement?

STOP

78 False

79 What should Writeall write in place of □ in
10 □ + 4 = 9
to get a true statement?

STOP

79 2

80 Does 2 in place of □ in
□ × 9 + 3 = 3
give a true statement?

STOP

80 Yes

81 What should Writeall write in place of □ in
□ × 25 + 9 = 9
to get a true statement?

STOP

81 0

324
MATHEMATICS-ALGEBRA

INTENSIFIED ALGEBRA R-1
A Review or Remedial Program
NANCY ANDERSON, University of Maryland
THOMAS GILBERT
Published by PROGRAMMED TEACHING AIDS, Inc.
3810 S. Four Mile Run Drive, Arlington, Virginia.

For use in FERSTER TUTOR, Program reusable, $10.00.
machine and program, separate answer tapes
replaceable. 1,300 frames (approx.)
Teacher’s Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): “Both
High School and College freshman.”
Prerequisites:
Average Time: 20 hours (est.).
(1 sample page)
MATHEMATICS-ALGEBRA

INTENSIFIED ALGEBRA R-1
Anderson, Gilbert; PROGRAMMED TEACHING AIDS, Inc.

one sample page

52. But the fact that 3.7 = 7.3 follows
from the _______ law for mul-
tiplication.

Topic IV - Multiplication and Division of Signed Numbers

41. Since -x is defined equal to (-1) x
then -(-x) = (-1) x

Topic VI - Operations on Algebraic Expressions

2. So 3x+4x = (3+4)x = ______x 

(total)

Topic VII - Division

14. 8x² = _______x

2x

Topic X - Linear Equations 1.

75. Solve w = -1

50 5

Topic XII - Fractions 1.

24. Thus a fraction can sometimes be
simplified by removing factors
common to the numerator and the
denominator. In this way

x²-a² = (x+a)(x-a)

3x-3a = 3(x-a)

326
MATHEMATICS - ALGEBRA Jr. H.S.

INTRODUCTION TO ALGEBRA
JACOB REGER, Programmer, General Programmed Teaching Corporation
JOHN MORRIS, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1000 frames, paperback, 200 pp.,
8-1/2" x 11", $ .
Teacher's Manual: "Instructions to teacher included in preface."
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 8th and 9th grade students."
Prerequisites: None.
Average Time: 10 hours (est.).
Next Revision:
(1 sample page)
**MATHEMATICS – ALGEBRA**

**INTRODUCTION TO ALGEBRA**
Reger, Morris; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page

<table>
<thead>
<tr>
<th>473</th>
<th>A term is an expression whose parts ARE NOT connected by addition or subtraction. Is $2 + y$ a term? Circle.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

474 The parts of a term are not connected by addition or subtraction. $3 - x$ is not a term because $3$ and $x$ are connected by addition. Is $y - 5$ a term?  

475 The parts of a term may be connected by multiplication or by division. Circle the letters before the terms below.  

<table>
<thead>
<tr>
<th></th>
<th>A) $2 + 5t$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B) $c - y$</td>
</tr>
<tr>
<td></td>
<td>C) $5d$</td>
</tr>
<tr>
<td></td>
<td>D) $\frac{w}{8}$</td>
</tr>
<tr>
<td></td>
<td>E) $\frac{a}{4} + (g + \frac{3}{2})$</td>
</tr>
<tr>
<td></td>
<td>F) $\frac{d}{4} + x$</td>
</tr>
</tbody>
</table>

476 An expression whose parts are not connected by addition or subtraction is called a **term**.
MATHEMATICS - ALGEBRA

AN INTRODUCTION TO VERBAL PROBLEMS IN ALGEBRA

DR. NATHAN LAZAR, Mathematics Education, Ohio State University

Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,024 frames, paperback, 147 pp., 8-1/2" x 11-1/2", $4.75.

For use in TEMAC BINDER, $1.25; program reusable, $3.50.

Teacher’s Manual available, $1.00.

Table of Contents.

Unit Test(s) available.

Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

“Berkeley, California public schools on development testing. Roanoke City Schools on evaluation testing.”

Other using population(s): “Any remedial students, pre-algebra.”

Prerequisites: “Ability to solve equation 3W is equal to 15.”

Average Time: 10-20 hours (est.).

No Revision.

(1 sample page)
9. The value of \( y \) which makes \( 6y = 12 \) a true statement is the number \( \boxed{2} \). Therefore, we say that this number is a solution of the equation, \( 6y = \boxed{12} \).

10. The solution of the equation, \( 2m = 15 \), is the number \( \boxed{\frac{15}{2}} \).

11. The equation, \( 3m = 12 \), means that "three times a certain unknown number, represented by the letter \( m \), is equal to twelve." This statement in words is called a translation of the equation into words.

12. When we express the meaning of the equation, \( 4x = 36 \), as "four times a certain number, represented by \( x \), is equal to thirty-six," we say that we have translated the equation, \( 4x = 36 \), into \( \boxed{4x = 36} \). words.

13. Another way of saying this is that the statement "four times a certain number, represented by \( x \), is equal to thirty-six," is a translation of the equation, \( \boxed{4x = 36} \).

14. The sentence which expresses, in words, the meaning of an equation is called a \boxed{translation of the equation into words}.

15. We have seen that a solution of the equation, \( 4m = 36 \), is the number \( \boxed{9} \).

16. Furthermore, 6 is the only solution of \( 4x = 36 \) since, when any number other than \( 9 \) is multiplied by 4 we (do/do not) \( \boxed{do not} \) get 36 as the product.
THE LANGUAGE OF ALGEBRA
Fields and Ordered Fields
F. WILLIAM LAWVERE, Britannica Center for Studies in Learning and Motivation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,947 frames, paperback, 342 pp., 8-1/2" x 11-1/2", $7.30. Available in 2 separate units @ $4.50 each.
For use in TEMAC BINDER, $1.25; program reusable, $6.05.
Teacher's Manual available, $1.25.
Table of Contents.
Unit Test(s) available, $1.60.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students at Hollins College, Roanoke Public Schools developmental and public school classrooms at Roanoke, Virginia for field test."
Other using population(s): "Advanced high school students, professional review, teacher training in modern mathematics."
Prerequisites: "Basic understanding of algebra."
Average Time: 35-40 hours for average students (est.).
No Revision.
(1 sample page)
THE LANGUAGE OF ALGEBRA

Lawvere; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page

Theorem 13-20

\[ \frac{3x+3}{x^2-1} \]

Similarly,

\[ \frac{2x+2}{x^2-1} \]

107. When multiplying or dividing fractions, there is of course no need to find common denominators. The techniques in such examples is to cancel as many common factors from numerators and denominators as is possible at every stage. For example:

\[ \frac{x-30}{x+10} \]

\[ \frac{x+30}{x+10} \]

\[ \frac{x-10}{x+10} \]

109. The Language of Algebra: Fields and Ordered Fields

332
MATHEMATICS—ALGEBRA
Jr. H.S.

NUMBER SENTENCES
An Introduction to Equation Solving
VERNON L. DAUSCH, Millburn Jr. H. S.
MARTIN M. MOSKOWITZ, Mathematics Department,
Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Department,
Weequahic H. S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, New York

Programed text, 600 frames, 144 pp., paperback, 8-1/4” x
11”, $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy,
program can be reusable.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple
Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Average 7th and 8th grade students. Some testing of
students in Grades 5 and 6.”
Prerequisites: “Programs will fit in with both “modern”
and traditional backgrounds.”
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)
SPECIAL PROPERTIES OF THE NUMBER 0

110. In the last few sections you have been dealing with properties of operations. Now you are going to take a look at special properties of certain numbers.

First we will talk about the number 0. When 0 is added to 7, the sum is ——?
  a. 0  b. 7

111. Look at the list below and fill in the blanks to make each of the number sentences true.

a. $11 + 0 = \_\_\_\_\_\_\_

b. $17 + 0 = \_\_\_\_\_\_

c. $0 + 0 = \_\_\_\_\_\_

d. $1 + 0 = \_\_\_\_\_\_

e. $a + 0 = \_\_\_\_\_\_

112. When 0 is added to any number, it ——?— change that number.

a. does  b. does not

113. No matter what number $a$ stands for, $a + 0 = ——?—.

a. 0  b. 1  c. $a$

e. $a$

114. You know that $a + 0 = a$. And you know that addition is commutative. Then you can say that $0 + a = ——?

a. 0  b. 1  c. $a$

e. $a$
MATHEMATICS - ALGEBRA  Jr. H.S.-Coll.

PROGRAMMED BEGINNING ALGEBRA
IRVING DROOYAN,
WILLIAM WOOTON, both of Pierce College, Los Angeles, California
Published by JOHN WILEY & SONS, Inc.,
605 Third Avenue, New York 16, N.Y.

Programed text, 4500 frames, spiral bound, 752 pp.,
8 1/2" x 11", $14.00. Available in 5 separate units
at $2.85 each.
Teacher's Manual available, free.
Table of Contents.
Unit and Prerequisite Test(s) available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Jr.-sr. H.S. students, first year college students,
tech. institute students, heterogeneous group of
employees in industrial training program."
Prerequisites: 8th grade reading level, mastery of
arithmetic (through fractions).
Average Time: 42-97 hours (est.).
Next Revision:
(4 sample pages)
272. "Find a number such that five more than the number is 9." This sentence is what is called a "word problem" or a "stated problem." It asks us to find a number that is subject to the condition that its sum with five is 9. This condition is expressed by the equation
\[ x + 5 = 9 \]
Any letter will do for the variable.

273. Solve \( x + 5 = 9 \).

274. Since five more than 4 is 9, 4 (is/is not) the solution of the word problem in Frame 272.

275. "If four times a certain number is increased by 1, the result is 29. What is the number?" Let \( x \) represent a number and write an equation representing the conditions on the number stated in the first sentence.

276. If the solution of \( 4x + 1 = 29 \) is evident, write it directly. If the solution is not evident, transform the equation to an equivalent equation in which the solution is evident. The solution of \( 4x + 1 = 29 \) is \( x = 7 \).

277. Does four times 7 increased by 1 equal 29?

Yes
Remark. While the quadratic formula offers a way to find the solutions of any quadratic equation, you generally resort to it only when you cannot find solutions an easier way. For example, if possible, it is more efficient to solve such an equation by factoring or by the extraction of roots.

289. The most efficient way to solve \( x^2 - 3x - 4 = 0 \) would be by (circle one)
   a) factoring  b) extraction of roots  c) formula

290. The most efficient way to solve \( x^2 - 8 = 0 \) would be by (circle one)
   a) factoring  b) extraction of roots  c) formula

291. The most efficient way to solve \( 2x^2 - 3x - 2 = 0 \) would be by (circle one)
   a) factoring  b) extraction of roots  c) formula

292. Since the left member of \( 2x^2 - 3x - 6 = 0 \) will not factor, the way to solve the equation would be by (circle one)
   a) factoring  b) extraction of roots  c) formula

Programmed Beginning Algebra/Unit VIII 42
time

689. Suppose a freight train travels 120 miles in the same length of time an express train travels 180 miles, and suppose that the express travels 20 miles per hour faster than the freight; how fast must each be traveling? Since the time the trains travel is the same in each case, it seems reasonable to approach the problem by writing an equation relating the ________ each travels.

\[ r + 20 \]

690. If \( r \) represents the rate of the freight, and if the express travels 20 miles per hour faster than the freight, the rate of the express is given in terms of \( r \) by ________.

\[ \frac{120}{r} \]

691. If the freight train travels 120 miles at a rate \( (r) \), the time it takes to do this can be represented by the expression ________.

\[ \frac{180}{r + 20} \]

692. If the express train travels 180 miles at a rate \( (r + 20) \), the time it takes to do this can be represented by the expression ________.

693. The fact that the time traveled by the freight train and the time traveled by the express train is the same, can be expressed in terms of \( r \) by the equation ________.

40

694. The solution of \( \frac{120}{r} = \frac{180}{r + 20} \) is ________.

Programmed Beginning Algebra/Unit V 106
Remark. This unit introduces a part of the vocabulary necessary for the successful study of algebra. The terms are introduced through a consideration of the numbers of arithmetic, and certain properties associated with these numbers.

1. Any collection of things is called a set. The letters in the English alphabet form a set.

2. The collection of coins in a man's pocket is a set.

3. Braces, \{\}, are used to identify a set. Thus, \{1, 2, 3, 4, 5\} is the set of numbers 1, 2, 3, 4, and 5.

Similarly, \{8, 10, 12\} denotes the set of numbers 8, 10, and 12.

4. Any one of a collection of things in a set is called a member of the set. Thus, 3 is a member of \{3, 4, 5\}.

5. A member of a set is also called an element of the set. Thus, 3, 4, and 5 are the members or the elements of \{3, 4, 5\}.

Programmed Beginning Algebra/Unit I
MATHEMATICS-ALGEBRA

A PROGRAM IN CONTEMPORARY ALGEBRA
I Sets, Numbers and Language of Algebra
II Equations and Inequalities in One Variable
III Equations and Inequalities in Two Variables
IV Polynomial Expressions Relations and Functions
V Exponents, Radicals and Quadratic Equations

RALPH T. HEIMER, University of South Florida
FRANK KOCHER, Pennsylvania State University,
JOHN J. LOTTES, State University College, Genesee, N. Y.

Published by HOLT, RINEHART AND WINSTON,
383 Madison Ave., N. Y. 17, N.Y.

Programed text, 3792 frames, paperback, 728 pp., 8-1/2" x 11", available in 5 separate volumes @ $1.20 each.
Teacher’s Manual available, $.60.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“High School and College students.”
Other using population(s): “Inservice and preservice training of math teachers; College students with little previous math.”

Prerequisites: “The program assumes a knowledge of the arithmetic of positive integers, but no previous study of algebra is required.”

Average Time: 32-1/2 hours (est.).
Next Revision: unknown

(2 sample pages)
Every natural number is an integer. Is every integer a natural number?

**NO**

For example, \((-1)\) is an integer, but it is not a natural number.

The number 0 is an integer. Is it a natural number?

**NO**

The additive inverse of 7 is \((-7)\).

Is the additive inverse of 7 an integer?

**YES**

The additive inverse of \((-6)\) is the number ___

Is the additive inverse of \((-6)\) an integer?

**YES**

The number \((-1)\) is

(a) an integer
(b) a natural number
(c) both (a) and (b)
(d) neither (a) nor (b)

**AN INTEGER**
If $x < N$, then the point whose coordinate is $x$ appears to the left of the point whose coordinate is $N$. Hence $x < N$.

The word "arithmetic" is normally construed to mean the study of certain numbers under the operations of addition, subtraction, multiplication, and division.

We shall undertake a study of the arithmetic of real numbers, that is, study the real numbers under the operations of addition, subtraction, multiplication, and division.

We know how to add two positive numbers. For example, $2 + 3 = 5$ and $1 + 7 = 8$. 5 is said to be the sum of 2 and 3, and 8 is said to be the sum of 1 and 7.
MATHEMATICS-ALGEBRA

SECONDARY MATHEMATICS SERIES - ALGEBRA REFRESHER

CHARLOTTE YESSELMAN, Teaching Materials Corporation.

Published by TEACHING MATERIALS CORPORATION:
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,313 frames, paperback, 752 pp., 8-1/2" x 11¼", bound in 4 separate volumes, $16.00.
For use in MIN/MAx II machine, $25.00; program reusable, $15.00.

Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“High school graduates who had studied one year of Algebra.”
Prerequisites: “Ability to read at 8th grade level and to add, subtract, divide and multiply whole numbers, fractions and decimals.”
Average Time: 30-50 hours (based entirely on data).
(2 sample pages)
### MATHEMATICS-ALGEBRA

**SECONDARY MATHEMATICS SERIES—ALGEBRA REFRESHER**

Yesselman; TEACHING MATERIALS CORPORATION

2 sample pages

| 124 | If the first expression in is parentheses, it usually does not have 
|-----| "-" sign in front. In \((a + b) - c\), \((a - b)\) (does/dose not) have a 
<table>
<thead>
<tr>
<th></th>
<th>&quot;-&quot; sign in front.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>does not</td>
</tr>
</tbody>
</table>

| 107 | If the first expression in is parentheses, it has a "-" sign in front. 
<table>
<thead>
<tr>
<th>-----</th>
<th>In ((a + b) - c), the parentheses (can/cannot) be removed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----</td>
<td>can</td>
</tr>
</tbody>
</table>

| 108 | \(-(a + b)\) means the same thing as \(-1(a + b)\). By the distributive law 
|-----| \(-1(a + b) = -a - b\). 
|-----| \(-(a - b)\) means the same thing as \(-1(a - b)\). By the distributive law  
<table>
<thead>
<tr>
<th>-----</th>
<th>(-1(a - b) = -a - (-b)).</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----</td>
<td>(-a - b)</td>
</tr>
</tbody>
</table>

| 109 | By the distributive law: To remove parentheses with "-" sign in front, change 
|-----| all "-" signs inside to "+". 
|-----| \(a - (b + c) = a - b - c\). 
<table>
<thead>
<tr>
<th>-----</th>
<th>Also: (a \cdot (y + z) = a\cdot y + a\cdot z).</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----</td>
<td>(x \cdot y \cdot z)</td>
</tr>
</tbody>
</table>

| 110 | \(-(-a + b)\) \(\rightarrow \) (Remove parentheses) 
|-----| \(+(a + b)\) \(\rightarrow \) (Remove parentheses) 
<table>
<thead>
<tr>
<th>-----</th>
<th>(-(-a - b)) (\rightarrow ) (Remove parentheses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----</td>
<td>(-x - z) (\rightarrow ) (x + z)</td>
</tr>
</tbody>
</table>

344
If $y = -1$, $x = -2$

Fill in the table.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>3</td>
<td>-3</td>
</tr>
</tbody>
</table>

Plot and connect in order.
SECONDARY MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA
Part I and Part II
JAMES L. EVANS
CHARLOTTE YESSELMAN, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed texts; Part I, 1,933 frames; Part II, 4,385 frames; paperbacks; Part I, 462 pp.; Part II, 927 pp.; 8-1/2" x 11"; Part I, bound in 2 separate volumes, $11.00; Part II, bound in 4 separate volumes, $16.00.

For use in MIN/MAX II machines, $25.00; programs reusable, Part I: $10.00, Part II, $15.00.

Teacher's Manual: General Manual for all TMI-Grolier programs available

Unit Test(s) included (Part I) Final Test included (Part I & Part II).

Table of Contents.

Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Part I: "Eighth graders having no prior Algebra background - average age 13 years 6 months."
Part II: "Eighth grade students who have completed FUNDAMENTALS OF ALGEBRA, Part I - average age 13.5".

Other using population(s): "Brush up for those having had beginning Algebra."

Prerequisites: "Ability to read at 8th-grade level and to add, subtract, divide and multiply whole numbers, fractions, and decimals."

Average Time: Part I: 15-25 hours (based entirely on data); standard deviation, 7.07 hours. Part II: 30-50 hours (based entirely on data); standard deviation, 29.0 hours.


(6 sample pages)
Do additions inside the parentheses first.

7 + (3 + 1) = 7 + (4)
12 + (2 + 9) = 12 + (11)

(Please the pattern of the example.)

12 + (13)

After addition gives a single number, parentheses can be removed.

5 + (6 + 7) = 5 + (13) = 5 + 13
4 + (3 + 10) = 4 + (13) = 4 + 13

4 - (13) = 4 - 13

You can do two steps before writing your answer if you are careful.

5 - (5 + 6) = 5 - 11 (adding and removing parentheses).
14 - (3 + 1) = 11

14 - 3

After removing the parentheses, add

1 - (3 + 2) = 1 - 5 = -4
4 - (6 + 2) = 4 - 8 = -4

4 - 8 = 12

In (3 + 6) = 9, the __________ show that
3 and 6 are added first.
If a product has a single arithmetic number for a factor, that number is called a NUMERICAL COEFFICIENT of the other factors. In $x$, $3$ is the _______ of $x$. The numerical coefficient of $x$ is ____.

A numerical coefficient can be a fraction. In $\frac{1}{2}x$, the numerical coefficient is $\frac{1}{2}$. What is the numerical coefficient in $\frac{1}{2}x$? ____

In $\frac{3}{2}x$, $\frac{3}{2}$ is the _______

$\frac{1}{2}x$ can be written $\frac{1}{2}x^2$ or $\frac{1}{2}x$. Similarly, $\frac{1}{3}$ can be written $\frac{1}{3}x$. Write $\frac{1}{2}$ with a fractional coefficient. ____
You are going to learn an easy way to take square roots, using the Table of Approximate Square Roots.

Table I shows the square roots of numbers from 1 to 1000. (Ask your instructor for Table I.)

Table 1

<table>
<thead>
<tr>
<th>N</th>
<th>√N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
</tr>
<tr>
<td>2</td>
<td>1.414</td>
</tr>
<tr>
<td>3</td>
<td>1.732</td>
</tr>
<tr>
<td>4</td>
<td>2.000</td>
</tr>
<tr>
<td>5</td>
<td>2.236</td>
</tr>
</tbody>
</table>

In Table I, some columns are labeled "N." Other columns are labeled "√N." If you find a number in a column labeled "N," you can guess that the square root of that number is next to it in a column labeled "√N."

Look on the first page of Table I.

When N is 1, √N is 1.000.
When N is 2, √N is 1.414.
When N is 3, √N is 1.732.
When N is 4, √N is 2.000.
When N is 5, √N is 2.236.

TEST

1. 732
2. 000

√57.44
√128.00
<table>
<thead>
<tr>
<th>( \sqrt{16} )</th>
<th>( \sqrt{25} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sqrt{36} )</td>
<td>( \sqrt{100} )</td>
</tr>
<tr>
<td>( \sqrt{49} )</td>
<td>( \sqrt{144} )</td>
</tr>
</tbody>
</table>

In other words, \( \sqrt{\frac{ab}{c^2}} \).}

If the expression under the square root sign is a perfect square, you may leave off the square root sign only after taking the square root of the expression. Ex: \( \sqrt{9} \) is a perfect square, so you can express \( \sqrt{9} \) as \( 3 \). You cannot express \( \sqrt{9} \) as just \( 9 \). Express \( \sqrt{xy} \) without the square root sign. **

If the expression under the square root sign is a perfect square, and you write its square root, you do not use the square root sign. Ex: \( \sqrt{9} \) is not \( \sqrt{3} \). **
In some fractions it may be necessary to factor before we can cancel.

\[ \frac{a+b}{a+b} = \frac{a}{a} = 1 \]

(removing a common numerical factor)

\[ \frac{x+y}{x+y} \]

(factoring, canceling, and reducing)

factor the fraction and reduce to lowest terms.

\[ \frac{x+y}{x} \]

Did you factor first?

\[ \frac{(x+y)}{x} \]

Factor and reduce:

\[ \frac{x+y}{x} \]

Factor and reduce:

\[ \frac{x(y+z)}{x+y} \]

Factor and reduce:

\[ \frac{x+y}{x+y} \]

Factor and reduce if possible.

A. \( \frac{x+y}{x+y} \)
B. \( \frac{x+y}{x+y} \)

A. \( \frac{x+y}{x+y} \)
B. \( \frac{x+y}{x+y} \)
The L.C.D. of \( \frac{3}{7} \) and \( \frac{4}{8} \) is \( 7 \cdot 8 \cdot r \cdot s \). The denominator of \( \frac{3}{7} \) does not have the factors 3 and 4 which are found in the L.C.D. The denominator of \( \frac{4}{8} \) does not have the factors 3 and 4 which are found in the L.C.D.

The L.C.D. of \( \frac{1}{2} \) and \( \frac{1}{3} \) is \( 2 \cdot 3 \cdot r \). We must multiply the numerator and denominator of \( \frac{1}{2} \) by 3, the missing factor, to get a like fraction: \( \frac{1 \cdot 3}{2 \cdot 3} = \frac{3}{6} \).

What factor of the L.C.D. was missing in the denominator of \( \frac{1}{2} \)?

The L.C.D. of \( \frac{1}{7} \) and \( \frac{1}{2} \) is \( 7 \cdot 2 \cdot r \cdot s \). The factors \( r \) and \( s \) which are found in the L.C.D.

What method would you use to add \( \frac{4}{7} \) and \( \frac{4}{8} \)?

<table>
<thead>
<tr>
<th>L.C.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-106</td>
</tr>
</tbody>
</table>
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Average and above average ability 7-8 grade.
Prerequisites: “Facilities with negative quantities and signs.”
Average Time: 4 hours (est.).
Next Revision:
(1 sample page)
There is one more step in setting out these equations. So far, the solutions at the beginning have been easy because all the signs in the equations were plus. This does not always happen, but from earlier algebra we have a rule for subtracting, 'Change the sign on the bottom line and add', like this.

\[ \begin{align*}
3x - 2y &= 18 \\
2x + y &= 2 \\
\text{Subtract: } & 2x + y = 2 \\
\text{Add: } & x - 3y = 16 \\
\text{Answer: } & x = 10, y = 2
\end{align*} \]

Similarly,

\[ \begin{align*}
5x + 3y &= 21 \\
4x - 2y &= 12 \\
\text{Subtract: } & 5x + 3y = 21 \\
\text{Add: } & x - 2y = 3 \\
\text{Answer: } & x = 5, y = 4
\end{align*} \]

We use this in the first part of the solutions of these equations. Let us work through the example in A31 again, so that we can compare the results:

\[ \begin{align*}
3x + 7y &= 17 \quad \text{[1]} \\
3x - y &= 5 \quad \text{[2]} \]

\[ \begin{align*}
\text{Subtract: } & 3x + 7y = 17 \\
\text{Add: } & -3x - y = 5 \\
\text{Answer: } & y = 2
\end{align*} \]

Next problem:

\[ \begin{align*}
4x + 3y &= 29 \quad \text{[1]} \\
4x + 2y &= 23 \quad \text{[2]} \\
\text{Subtract from [1]} & \quad \text{[2]} \\
\text{Change the signs on the top line and add:} \\
4x + 7y &= 29 \\
6x &= -29 \\
5y &= -29 \\
\text{Answer: } & x = 2, y = -2
\end{align*} \]
MATHEMATICS - ALGEBRA

SOLVING ARITHMETIC WORD PROBLEMS
Be a Problem Analyst
DIANE CUMMINGS, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.)
including 3 programs; program reusable, 200 frames,
$2.00-$2.50.

Constructed Responses sometimes used; some Multiple
Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)
The first step in analyzing every problem is taking out the DATA. The data is the information in the problem.

Study the problem below:

In the first four years of the space age, several satellites were placed in orbit. First, 2 satellites were successful. Later, 8 satellites; then, 11 satellites; and, finally, 18 satellites were successful. After four years, how many satellites were placed in orbit?

The underlined words give you the information, or

Study the problem below:

It is about 26,000,000 miles from the sun to Mercury and about 31,000,000 miles from Mercury to Venus. It is only 26,000,000 miles from Venus to earth.

What is the sum of these distances?

All the data items are underlined except

Here is the problem with all the data underlined:

It is about 26,000,000 miles from the sun to Mercury and about 31,000,000 miles from Mercury to Venus. It is only 26,000,000 miles from Venus to earth. What is the sum of these distances?

How do Step 1 in the analysis; that is, find the data in the problem.

Here is the data record of the problem in the previous frame:

36,000,000 miles
31,000,000 miles
26,000,000 miles

The data record is all the data in the problem and, then, recorded.
MATHEMATICS – ALGEBRA

VECTOR ALGEBRA
R. K. MOORE, Programer
HENRY C. ELLIS, Programer
HOWARD LINDBERG, Programer
AMARYLLIS D. HUNT, Editor

Published by GENERAL PROGRAMMED TEACHING CORPORATION, 1719 Girard, N. E., Albuquerque, New Mexico

Programed text, 353 frames, paperback, 71 pp., 8-1/2" x 11", $1.75.

Table of Contents.
Final test available.
Constructed Responses always used; some Branching (*A linear supplement in determinants is supplied and is a type of branching known as branching-within-linear programing, as distinct from Crowderian branching); no Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Engineering college students at the University of New Mexico."

Prerequisites:
Additional material required: "Slide rule may be useful."
Average Time: 5 hours (based entirely on data).
Next Revision: 1968.

(1 sample page)
The area of the parallelogram is given by the formula \( A = bh \).

Why is the magnitude of the cross product \( \mathbf{A} \times \mathbf{B} \) equal to the area of the parallelogram formed by \( \mathbf{A} \) and \( \mathbf{B} \)?

Because \( \mathbf{A} \times \mathbf{B} = |\mathbf{A}| |\mathbf{B}| \sin \theta \mathbf{N} \),

\[ |\mathbf{A} \times \mathbf{B}| = \mathbf{A} \cdot \mathbf{B} \cdot \sin \theta \]

The component of \( \mathbf{R} \) in the direction of the vector \( \mathbf{v} \) is \( \frac{\mathbf{R} \cdot \mathbf{v}}{\mathbf{v} \cdot \mathbf{v}} \).

\[ \mathbf{R} = 3\mathbf{a} - 4\mathbf{b} + 14\mathbf{c} \]

The component of \( \mathbf{R} \) in the direction of the vector \( \mathbf{v} = 2\mathbf{a} - 4\mathbf{b} + 24\mathbf{c} \) is \( \mathbf{R} \).

\[ \mathbf{F} \times \mathbf{F} = \mathbf{0} \]

Find the work done by \( \mathbf{F} \) in moving an object from \( \mathbf{R} \) to \( \mathbf{S} \).

Find the moment of force about \( \mathbf{S} \) if \( \mathbf{F} \) is applied at \( \mathbf{R} \).

Find the area of a parallelogram whose sides are the vectors \( \mathbf{A} = 4\mathbf{a} + 6\mathbf{b} - 3\mathbf{c} \) and \( \mathbf{B} = -4\mathbf{a} - 3\mathbf{b} + 2\mathbf{c} \).

Find the vector \( \mathbf{A} \times \mathbf{B} \) and then determine its magnitude.
THE ARITHMETIC OF COMPUTERS
NORMAN A. CROWDER, Vice President and Technical
Director, U.S.I. Educational Science Division.
Published by: DOUBLEDAY & COMPANY, INC.,
575 Madison Avenue, N.Y.C.
British edition—THE ENGLISH UNIVERSITIES PRESS
LIMITED.

Programed text, 448 frames, hard cover, 469 pp.,
8 1/4" x 5 3/8", $4.95.
(A similar program, INTRODUCTION TO COMPUTER
MATHEMATICS, is available in TM format from:
EDUCATIONAL SCIENCE DIVISION, U.S. IN-
DUSTRIES, INC.,
250 Park Avenue, N.Y.C.
For use in AUTOTUTOR MARK II, $1,250; program
reusable, $100.00.)
Table of Contents, both programs; Index, programed text.
Unit Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Average Time: 10-12 hours for text, 8-20 hours machine
version. (est.)
Next Revision: “None scheduled.”
(1 sample page)
Sample from *The Arithmetic of Computers*

YOUR ANSWER: \(3^4 = 3 \times 3 \times 3 \times 3 = 81\).

You are correct. The symbol \(3^4\) means "the product formed by using 3 as a factor four times."

You can form an entire series of products by using a particular number as a factor twice, three times, four times, etc. These products are called the powers of the number. Thus:

\[
\begin{align*}
2 \times 2 &= 2^2 = 4, \text{ which is the 2nd power of } 2, \\
2 \times 2 \times 2 &= 2^3 = 8, \text{ which is the 3rd power of } 2, \\
2 \times 2 \times 2 \times 2 &= 2^4 = 16, \text{ which is the 4th power of } 2,
\end{align*}
\]

and so on.

\(2^2\) can also be called "2 raised to the 2nd power," \(2^3\) can also be called "2 raised to the 3rd power," and so on.

The 2nd power of 3, that is, 3 raised to the 2nd power, would be the number formed by using 3 as a factor twice.

What would 5 raised to the 2nd power be?

The 2nd power of 5 = \(5 \times 2 = 10\). \hspace{1cm} \text{page 12}

The 2nd power of 5 = \(5^2 = 5 \times 5 = 25\). \hspace{1cm} \text{page 24}

The 2nd power of 5 = \(2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32\). \hspace{1cm} \text{page 32}
APPLIED MATHEMATICS

ARITHMETIC FOR NURSES
MARILYN FERSTER, R.N.
Published by SPRINGER PUBLISHING COMPANY, Inc.,
44 East 23rd Street, New York 10, N.Y.

Programed text, 667 frames, paperback, 112 pp.,
6 3/4" x 10", $2.50.
Table of Contents.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"60 nursing students in Pittsburgh, Pa. area hospitals."
Prerequisites:
Average Time: 15 hours (est.).
Next Revision: "Not now planned."
(1 sample page)
F. Multiplication of decimal numbers is even simpler when one of the factors is 10 or any multiple of 10, because then you can use a short cut.

**Rule:**
Move the decimal point in one factor one place to the right for every 0 in the 10 (or multiple-of-10) factor.

**Example:** Multiply 25.3 by 1000.

<table>
<thead>
<tr>
<th>short cut</th>
<th>regular method</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.3 \times 1000 = 25300</td>
<td>compare 25.3 \times 1000 = 25300</td>
</tr>
<tr>
<td>3 zeroes</td>
<td>3 zeroes</td>
</tr>
</tbody>
</table>

In the short-cut method, you have to move the decimal point in 25.3 3 places to the right because 1000 has 3 zeroes. In order to do this, 2 zeroes are added to the right of 2. Look at the results using either method. Are they the same?

---

**F.1.** Multiply 0.0939 by 100.

0.0939 \times 100 = \[\boxed{93.9}\]

2 zeroes

Because one of the factors, 100, is a multiple of 10, you can use the short cut to multiply. Move the decimal point in 0.0939, 2 places to the right since 100 has 2 zeroes. Put the product in the double-line box.

---

**F.2.** For practice, use the short cut to multiply these factors.

(a) 5.63 \times 1000 = \[\boxed{5630}\]

(b) 42.09 \times 100 = \[\boxed{4209}\]

(c) 0.0009 \times 100 = \[\boxed{0.09}\]

(d) 0.50 \times 10,000 = \[\boxed{5000}\]

---

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APPLIED MATHEMATICS

BASIC COMPUTER PROGRAMMING

THEODORE G. SCOTT, U.S.I. Educational Science Division

Published by DOUBLEDAY & COMPANY, Inc.

575 Madison Avenue, New York, New York

Programed text, 457 frames, hard cover, 490 pp.,
8-1/4" x 5-3/8", $5.95.

A similar program, COMPUTERS, A Four-Part Course in
Programming, is available in TM format from
EDUCATIONAL SCIENCE DIVISION, U.S. INDUSTRIES,
Inc., 250 Park Avenue, New York, New York.

For use in AUTOTUTOR MARK II, $1,250; program reus-
able, available in 4 separate parts @ $100 each; com-
bination I-IV, $375.00.

Table of Contents, both programs; Index, programed text.
Unit Test(s) included, both programs; Final Test included
machine program.

Multiple Choice Responses, and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“High school graduates in business education; adult
education courses.”

Prerequisites: High school education.

Additional Equipment: Pencil, paper, machine program.

Average Time: 12-14 hours (est.) programed text; 24-40
hours, machine.

Next Revision:
(1 sample page) 457
YOUR ANSWER: The number -365 would appear in a memory cell as 1 0000000365.

Right. The decimal point is located at the extreme right of each cell. Thus, all whole numbers must be located in the right-hand positions. The sign digit (here 1, since -365 is a negative number) is located in the left-hand position of a cell.

Now let's have some practice coding numbers.

Here are three groups of numbers. Each number is followed by the corresponding TUTAC word. One number in one of these three groups is coded incorrectly. Which group contains the error?

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>921,165</td>
<td>0 0000921165</td>
<td>This group contains page 9 an error.</td>
</tr>
<tr>
<td>50,000</td>
<td>0 0000500000</td>
<td></td>
</tr>
<tr>
<td>-8,622,508</td>
<td>1 0008622508</td>
<td></td>
</tr>
<tr>
<td>1,010,101,010</td>
<td>0 1010101010</td>
<td>This group contains page 17 an error.</td>
</tr>
<tr>
<td>-183,002</td>
<td>1 000183002</td>
<td></td>
</tr>
<tr>
<td>-60</td>
<td>1 0000000060</td>
<td></td>
</tr>
<tr>
<td>1,000,000,009</td>
<td>1 0000000009</td>
<td>This group contains page 20 an error.</td>
</tr>
<tr>
<td>3</td>
<td>0 0000000003</td>
<td></td>
</tr>
<tr>
<td>-9,825</td>
<td>1 000000825</td>
<td></td>
</tr>
</tbody>
</table>
APPLIED MATHEMATICS

MATHEMATICAL BASES FOR MANAGEMENT DECISION MAKING - Unit I
Matrices and Mathematical Programming.
ALBERT G. HOLZMAN, Dept. of Industrial Engineering,
University of Pittsburgh
ROBERT GLASER, Dept. of Psychology, University of Pittsburgh
HAMLUTH H. SCHAEFER, Institute of Behavioral Research,
University of Maryland.

Published by: ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Ave., Chicago 11, Ill.

Programed text, 4,054 frames, paperback, 8 1/2" x 11 1/2",
$18.75. Bound in 3 separate units.
For use in TEMAC BINDER, $1.25; program reusable,
$17.50.
Teacher's Manual included.
Table of Contents.
Unit Test(s) included with program.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Industrial samplings; Westinghouse; Proctor & Gamble; Officers Section of Wright Patterson Center,
Dayton, Ohio; Undergraduate students in engineering,
University of Pittsburgh."
Other using population(s); "Mathematics courses on the
College level."
Prerequisites: None.
Average Time: "35 classroom hours for average college
level student" (est.).
No Revision.
(1 sample page)
The shipping cost to D, is
\[ a, e, c. \]

Since we have four destinations, the total shipping cost is
\[ b, e, a, c. \]

We can more conveniently express this as a double sum:
\[ \sum_{i=1}^{4} \sum_{j=1}^{4} \]

The total cost for this assignment is then
\[ \sum_{i=1}^{4} \sum_{j=1}^{4} \]

Since eight of the terms have a 3rd assignment, the cost is simply
\[ 100 + 2 = 102 \]

The solution obtained by selecting the minimum cost elements for shipping assignments (as we have done in this problem) usually gives an answer which is close to an optimum (best) solution. More sophisticated methods, such as linear programming, are needed to guarantee the solution to be an optimum or best.

In the transportation problem we have just solved, $315.60 is not the minimum cost solution. Therefore, we say that this is not the optimum or best solution.
THE MATHEMATICAL LANGUAGE OF SCIENCE
The Measurement of Space, Time and Matter
MARSHALL ARKY, et al., Roto-Vue
Published by MODEL PUBLISHING Company,
1606 Hodiamont Street, St. Louis, Missouri

Programed text, 1069 frames, paperback, 100 pp., 7"x10 1/2", available in 4 separate units at $2.25 each.
For use in HONOR SYSTEMS machine, $20.00; program reusable, $10.00.
Teacher's Manual included.
Table of Contents.
Diagnostic Test(s) included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Small groups of selected students for development. Field tested on two high school geometry classes and seven Junior High School science classes, and two large suburban school districts. Subsequent tests in large urban High School."
Prerequisites: Knowledge of decimal fractions.
Average Time: 10 hours (est.).
(1 sample page)
46. The meter is divided into smaller units just as the yard is divided into smaller units. One yard can be divided into three equal smaller units, each of which is called a foot. One meter is divided into 100 equal smaller units, each of which is called a centimeter. A meter can be divided into 100 smaller units each of which is called a millimeter.

A meter stick:

\[\text{1 cm} = \text{10 mm}\]

47. A centimeter is one-hundredth part of a meter. It takes one hundred centimeters to make a meter, just as it takes three feet to make a yard. One meter is made up of one hundred centimeters.

48. One hundred centimeters make a meter. This is similar to the system we use with money: one hundred cents make a dollar.

49. 100 centimeters equal 1 meter as 3 feet equal 1 yard. 200 centimeters equal 2 meters as 6 feet equal 2 yards. It takes 9 feet to make 3 yards. The number of centimeters it takes to make 3 meters is

50. 5 meters equals \[\text{centimeters}\]

51. 700 centimeters equal \[\text{meters}\]

52. A centimeter can be divided into 10 millimeters, just as a foot can be divided into 12 inches.

53. A centimeter can be divided into 10 millimeters. A cent or a penny, can be divided into 10 mills (these are used mostly for tax purposes).

54. The line below is actually 1 centimeter long. Each of the 10 spaces into which it has been divided is 1 millimeter:

\[\text{1 millimeter}\]

55. It takes 10 millimeters to make 1 centimeter. It takes 12 inches to make 1 foot, or 10 millimeters to make 1 centimeter.

56. 10 millimeters = 1 \[\text{centimeter}\]

57. The number of millimeters in any number of centimeters equals the number of centimeters multiplied by 10. 2 centimeters equal 2 x 10, or 20 millimeters:

\[\text{2 centimeters or 20 millimeters}\]

9 centimeters = 9 x 10, or \[\text{90 millimeters}\]
APPLIED MATHEMATICS

MEASUREMENT IN THE METRIC SYSTEM
NED HATTON, Programer
SHIRLEY B. BITTERLICH, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1500 frames, paperback, 300 pp., 8-1/2" x 11", $-
Teacher’s Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"8th-9th grade science students in Albuquerque; Similar students employed in field testing."
Prerequisits:
Average Time: 15 hours (est.).
Next Revision: 1968
(1 sample page)
A number with a unit describes a definite magnitude of a physical quantity. Which expression does not do this?

- one ounce
- 3 yards
- 4 seconds
- meters

Circle the part of the expression which indicates what kind of standard amount is being used to describe the physical quantity.

- 9 gm

Which expression does not indicate a definite magnitude of a physical quantity.

- 7 min
- two thumbs
- five hours
- 3 km

Circle the part of the expression which indicates how many standard amounts are necessary to describe the physical quantity.

- eight millimeters

The (1) in the description of a physical quantity tells "how many" and the (2) tells "of what kind."

- (1) number
- unit
- (2) number
- unit
APPLIED MATHEMATICS

NUMBERS AND UNITS FOR SCIENCE
FRANK E. HARRIS, Dept. of Chemistry, Stanford University;
in conjunction with Behavioral Research Laboratories,
Palo Alto, California.
Published by ADDISON-WESLEY Publishing Co., Reading
Mass.

Programed text, 1000 frames; paperback, 250 pp. 8 1/2" x
11", $3.75 (approx.).
Teacher's Manual available, $7.00.
Table of Contents.
Unit, Final, Diagnostic Test(s) available. More than one
equivalent form of Unit Test available.
Constructed Responses usually used; some Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): “High
school students with an I.Q. range of 95-145.”
Prerequisites: None
Average Time: 15 hours (est.)
Next Revision:
(t sample page)
CHEMISTRY SECTION X TEMPERATURE

57. If we speed up the random motion of the molecules of an object we increase its __________ temperature.

58. The temperature of an object doesn't tell us how many molecules the object has. It only tells us how ______ they are going. fast

59. If two glasses of water are at the same temperature the average speeds of the molecules in both glasses are ______ equal.

60. If the molecules of one object cannot change the average speed of the molecules of another object by collisions the two objects are at the same ______ temperature.

61. If the molecules of an object are moving very slowly, its temperature is very ______ low or cold.

62. There is no way of completely stopping the molecules of an object from moving at all. But if we could do this we would have made the lowest possible ______ temperature.

63. We call the lowest possible temperature the absolute zero of temperature. The absolute zero is the temperature at which the molecules do not ______ move randomly at all.

64. Because molecules are always moving randomly no matter what we do, we cannot cool off an object until it reaches the temperature of absolute ______ zero.

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APPLIED MATHEMATICS

NUMERATION SYSTEMS AND SCIENTIFIC NOTATION

MILDRED REIGH, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept.; all of Bucknell University.

Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher’s Manual available.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Developmental: 12 seventh grade students drawn from upper half of class. Test: 90 seventh grade students, one half average and one-half above average in mathematics ability.”
Prerequisites: “Knowledge of arithmetic including fractions.”
Average Time: 22 hours (est.).
Next Revision: June, 1963.
(1 sample page)
(Preliminary Version)

15 Thus, when you are asked for the factors of 20, you are to find two (or more) numbers that, when multiplied together, have a product of 20.

(1) Thus, the factors of 20 could be 2 and ___

(2) Or, the factors of 20 could be 4 and ___

(3) Or, the factors of 20 could be 1 and ___

(1) 10 (2) 5 (3) 20

16 Factors of 21 could be 21 and 1 or 3 and 7.

(1) Factors of 35 could be ___ and ___

(2) ___ or ___ and ___

(1) 5 and 7 \{ may have reversed order
(2) 35 and 1 \}
APPLIED MATHEMATICS

PRACTICAL MATHEMATICS
GRACE C. MARTIN
ANN SMALLEY, both of U.S.I. Educational Science Division.
Published by DOUBLEDAY & CO., Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 900 frames, Hard cover, 695 pp.,
8 1/4” x 5 3/8”, $5.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education
Average Time: 12-16 hours (est.).
Next Revision: Undetermined.
(1 sample page)
Now that you've learned how to handle signed numbers and exponents, the battle's half won. You're well on your way to a mastery of the fundamentals of algebra. Remember, the better you learn the basic rules, the easier it will be to understand more complicated operations.

We're going to use some of these basic rules now to simplify some rather formidable-looking algebraic expressions.

Any combination of explicit arithmetic numbers and literal numbers by addition, subtraction, multiplication, or division is called an algebraic expression.

\[
3x - y - 2 \\
a^2 - 6b^2 + c \\
5r^2 \\
\frac{6y - 3}{2} \\
c + 2d - 1
\]

are all algebraic expressions.

The parts of the expression joined together by plus or minus signs are called the terms of the expression.

How many terms are there in the algebraic expression \(4x^2y^3\)?

One. page 176A

Three. page 180A
THE SLIDE RULE
ROBERT SAFFOLD
ANN SMALLEY, both of Doubleday & Co.
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 456 frames, hard cover, 466 pp.,
8 1/4" x 5 3/8", $4.95.
Table of Contents, Index.
Unit Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: Slide rule.
Average Time: 10-12 hours (est.)
Next Revision: "Not scheduled."
(1 sample page)
YOUR ANSWER: The antilog of 13.68 is $4.79 \times 10^{12}$.

Correct. The part of the logarithm to the left of the decimal can be considered the exponent of a power of 10. The part to the right of the decimal is the log of a factor between 1 and 10 by which the power of ten is to be multiplied.

To put this another way, the logarithm 12.68 may be considered the sum of the logarithm 12.00 plus the logarithm 0.68. So the number whose logarithm is 12.68 can be considered the product of the antilogs of 12.00 and 0.68.

The antilog of 12.00, of course, is $10^{12}$. The antilog of 0.68 is found by a direct reading. Locate 0.68 on the L scale with the hairline and read the antilog on the D scale; it's 4.79. So the antilog of 12.68 is $4.79 \times 10^{12}$; therefore, $64.8^7 = 4.79 \times 10^{12}$.

If instead of raising 64.8 to the seventh power, you want to find the seventh root of 64.8 ($\sqrt[7]{64.8}$), what would you do first?

Divide log 64.8 by 7. page 222
Divide log 64.8 by log 7. page 232
MATHEMATICS - GEOMETRY

APPLIED GEOMETRY 36
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 8640 frames, paperback, 5" x 7", 288 pp.,
available in 8 separate units at $3.75 each.
For use in SPEED machine, program reusable, $80.00.
Teacher’s Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Arithmetic
Additional material required: SPEED teaching machine,
$700 & $850.
Average Time: 20 hours (est.).
Next Revision:
(2 sample pages)
**HOW TO NAME AN ANGLE**

The common ways to name an angle are:

1. Place a number between the sides.
2. Place a lower-case letter between the sides.
3. Use the name of the vertex if only one angle has that vertex.
4. Use three capital letters. Be sure to put the vertex letter in the middle.

In figure (1), \( \angle A \) can be named \( \angle APC \), \( \angle CVA \) or simply \( \angle F \). Since \( \angle B \) in figure (2) is the vertex of more than one angle, none of the angles can be named \( \angle B \). Another name for \( \angle B \) is \( \angle WER \); \( \angle A \) is also \( \angle WER \); and another name for \( (\angle 1 + \angle 4) \) is \( \angle WER \).
The common ways to name an angle are:

1. Place a number between the sides.
2. Place a lower-case letter between the sides.
3. Use the name of the vertex if only one angle has that vertex.
4. Use three capital letters. Be sure to get the vertex letter in the middle.

In figure (1), \( \angle 1 \) can be named \( \angle ACP \) or simply \( \angle C \). Since \( \angle 1 \) is in figure (2) is the vertex of more than one angle, none of the angles can be named \( \angle 2 \). Another name for \( \angle 4 \) is \( \angle NEM \); \( \angle 4 \) is also \( \angle NEM \); and another name for \( \angle 5 \) is \( \angle WED \).

The common ways to name an angle are:

1. Place a ______ between the sides.
2. Lower-case ______.
3. Use the name of the ______ if only one angle has that ______.
4. Use ______ capital letters.
5. Place a ______ letter between the sides.
6. Another name for angle \( b \) in the following figure is ______.

1. MNO
2. vertex, vertex
3. lower case
4. side, side
5. two
6. three
7. upper case
8. MNO
9. number
10. use
PLANE GEOMETRY
EDWARD B. CURTIS, Teaching Fellow, Harvard University.
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 11,207 frames, paperback, 1,151 pp.,
8-1/2" x 11-1/2", $19.75. Available in 5 separate
units @, $4.50 each.
For use in TEMAC BINDER, $1.25; program reusable,
$18.50.
Teacher’s Manual available, $3.50.
Table of Contents.
Unit Test(s) available, $1.60.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Selected groups during development; evaluative test-
ing Roanoke City Public Schools, Roanoke, Virginia.”
Other using population(s): “Adult education, professional
review.”
Prerequisites: “Student reading ability of eighthgrade level.”
Average Time: Average students, 185 classroom hours.
(est.).
No Revision.
(1 sample page)
4606. We see they that \( \angle AOC \) and \( \angle BOD \) are each equal to \( 180^\circ - \angle AOC \). We know then that \( \angle AOC \) and \( \angle BOD \) are equal.

4607. \( \angle AOC \) and \( \angle BOD \) are equal by the use of the axiom, 

Quantities equal to the same quantity are equal to each other.

4608. \( \angle AOC \) and \( \angle BOD \) are each

supplementary to \( \angle BOC \).

4611. We could show that \( \angle AOC \) and \( \angle BOD \) are equal in another way which is very similar to the preceding way. We would use the statement, "Supplements of the same angle are equal.

4612. Since \( \angle AOC \) and \( \angle BOD \) are supplements of \( \angle COB \), they must be equal.

4613. If \( \angle COB \) has \( 133^\circ \), then we would also know that \( \angle AOD \) has \( 133^\circ \).

4614. Then \( \angle BOD \) has (approximately) \( 47^\circ \).

4615. (On figure 341), we see three straight lines \( AB, CD, \) and \( EF \) which all pass through the point \( P \).

4616. (On figure 342), the three straight lines pass through the point \( P \). We say that the three lines are concurrent at \( P \).

4617. (On figure 343), \( \angle BPE \) and \( \angle EPB \) are two correct names for \( \angle Z P \).

4618. (On figure 344), \( \angle 3 \) and \( \angle 4 \) are a pair of vertical angles.

463. Plane Geometry.
POINTS, LINES, AND PLANES
An Introduction to Geometry in Two Dimensions
VERNON L. DAUSCH, Millburn Junior H. S.
MARTIN M. MOSKOWITZ, Mathematics Department,
Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Dept., Weequahic H. S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, New York

Programed text, 400 frames, paperback, 112 pp., 8-1/4" x 11", $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy;
program can be reusable.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Average 7th and 8th grade students. Some testing of students in Grades 5 and 6.”
Prerequisites: “Programs will fit in with both “modern” and traditional backgrounds.”
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)
114. As you have seen, polygons can be classified into two types: concave and convex. A polygon can also be classified according to the number of vertices (or sides, or angles) it has. A polygon with 3 vertices is called a 3-gon. A polygon which has 6 sides is called a __________ 6-gon

115. A polygon which has 9 angles is called a __________ 9-gon

116. A polygon which has 12 vertices is called a __________ 12-gon

117. If you saw the name "polygon RON," you would know that the polygon had _____ vertices. And then you would know that the polygon is a ____-gon _____

118. Suppose someone tells you about polygon RCFG. You know right away that the polygon is a ____-gon

119. Here is polygon KRATB.

The polygon is a __________-gon. It has _____ vertices, _____ sides, and _____ angles

120. Draw 6-gon MNOPQR.

121. Polygon MNOPQR has _____ vertices, _____ sides, and _____ angles.
MATHEMATICS—GEOMETRY

SOLID GEOMETRY
DAVID C. LUCKHAM, Research Assistant, Massachusetts Institute of Technology
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2,272 frames, paperback, 8-1/2" x 11-1/2", $15.00. Available in 3 separate units.
For use in TEMAC BINDER, $1.25; program reusable, $13.75.
Teacher’s Manual available, $1.75.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Selected students Palo Alto, Calif. during developmental stages. Roanoke City Public Schools during field test evaluation.”

Other using population(s): “Professional review; adult education.”
Prerequisites: “Reading level ninth grade.”
Average Time: 90 classroom hours for average students (est.).
Will not be revised.
(1 sample page)
7.2. REGULAR POLYHEDRONS

1.060 A solid geometrical figure bounded completely by planes is called a polyhedron. In the next few frames we shall see that the regular polyhedrons are given special names.

1.091 Now turn to Figure 540. The solid geometrical figure shown is called a _____________ since it is bounded completely by planes.

1.092 A polyhedron is any solid geometrical figure bounded completely by _____________.

1.093 The portions of the planes bounding a polyhedron are called its faces. Then $ABCD$ is a _____________ of the polyhedron shown in Figure 540.

1.094 How many faces does the polyhedron shown in Figure 540 have? _____________ (Note that _____________ of no faces are hidden from view.)

1.095 The lines of intersection of the planes forming the faces of a polyhedron are called the edges of the polyhedron. The intersections of the edges are called the vertices. How many edges of the polyhedron in Figure 540 meet at vertex $A$? _____________

1.096 How many edges intersect at vertex $A$? _____________

1.097 Can any of the faces of a polyhedron be curved surfaces (for example, a portion of a sphere)? _____________ (All faces of a polyhedron must be plane figures.)

SOLID GEOMETRY

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MATHEMATICS-LOGIC

BASIC SYMBOLIC LOGIC
JAMES L. BECKER, RCA
Published by RCA EDUCATIONAL SERVICES,
RADIO CORPORATION OF AMERICA.
Cherry Hill, Camden 8, New Jersey.

Programed text, 200 frames, paperback, 22 pp.,
8 1/2" x 11", $1.25.
“A Review and Test is included in the program.”
Constructed Responses usually used; some Multiple
Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Field Test - 15 Computer Technicians.
Prerequisites: “A knowledge of Binary Arithmetic is
desirable but not essential.”
Average Time: 1 1/2-2 hours.
Next Revision:
(1 sample page)
### MATHEMATICS-LOGIC

#### BASIC SYMBOLIC LOGIC

Becker; RCA EDUCATIONAL SERVICES

one sample page:

---

Using the following chart, complete the Truth Tables for the propositions "c" through "j:"

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>F</th>
<th>T</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>f</th>
<th>A ∨ B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>T</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Hint: invert Truth Table for A ∨ B (110)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>g</th>
<th>A ∧ B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>T</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Hint: construct Truth Table the same as v, except use A instead of a A, and F instead of B (485)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>h</th>
<th>A → B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(90)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>i</th>
<th>A ⊃ B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be careful (114)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>j</th>
<th>A ↔ B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(555)</td>
<td></td>
</tr>
</tbody>
</table>

Note, propositions "e" and "j" of item 17, have identical Truth Tables. Thus the Truth Table for A ↔ B is the same as ______ (560).

---

There are 5 basic rules for converting one logic formula (complex proposition) to another with the same Truth Table. These rules were first discovered by Augustus De Morgan and, in his honor, were termed De Morgan's Theorem. There are three steps to ______ (117) theorem which converts one logic formula to another that has the same ______ (372); they are:

---

389
WFF
The Beginner’s Game of Modern Logic
LAYMAN E. ALLEN, Yale Law School
Published by SCIENCE RESEARCH ASSOCIATES,
259 East Erie Street, Chicago 11, Illinois

Programed text, 71 frames, paperback, 84 pp., 2-1/4" x 4-1/4", $1.00 plus $.25 for mailing and handling from WFF 'N PROOF, Box 71, New Haven, Conn.; will be available from SRA late spring, 1963.
Teacher’s Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
“Unselected classes at each of the following grades:
6th grade, Orange, Conn.; 6th grade, Hamden, Conn.;
6-10th grade, Yale-North Haven, Conn.; 4-6th grade,
Palo Alto, Calif.; 7-9th grade, Palo Alto, Calif.”

Other using population(s): “Adults have played and enjoyed these beginning games.”

Prerequisites:
Additional material required: Logic cubes and playing mats (included with kit).
Average Time: 2 to 5 hours, depending on the students.”
Next Revision: February 1, 1963.
(1 sample page)
In the WFF games, the small letters 'p', 'q', 'r', and 's' are sentence variables. Each of them can symbolize any sentence whatsoever. For example, in one context we might stipulate that 'p' symbolizes the sentence "Logic is fun" and that 'q' symbolizes the sentence "Games are fun." If we did so stipulate, then the WFF 'Kpq' would symbolize the sentence "Logic is fun, and games are fun." What WFF would symbolize the sentence "Games are fun, and logic is fun"?

<table>
<thead>
<tr>
<th>WFF</th>
<th>Sentence Symbolized</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>p Logic is fun.</td>
</tr>
<tr>
<td>47</td>
<td>q Games are fun.</td>
</tr>
<tr>
<td>47</td>
<td>Kpq Logic is fun, and games are fun.</td>
</tr>
<tr>
<td>47</td>
<td>? Games are fun, and logic is fun.</td>
</tr>
<tr>
<td>48</td>
<td>Apq Logic is fun, or games are fun.</td>
</tr>
<tr>
<td>49</td>
<td>Cpq If games are fun, then logic is fun.</td>
</tr>
<tr>
<td>50</td>
<td>Np It is not so that logic is fun.</td>
</tr>
<tr>
<td>50</td>
<td>? It is not so that games are fun.</td>
</tr>
</tbody>
</table>
WFF 'N PROOF
The Game of Modern Logic
LAYMAN E. ALLEN, Yale Law School
Published by SCIENCE RESEARCH ASSOCIATES, 259 East Erie Street, Chicago 11, Illinois

Programed text, 2176 frames, paperback, 221 pp., 5" x 8", $6.00 from S.R.A. or plus 25¢ for mailing and handling from WFF 'N PROOF, Box 71, New Haven, Conn.
Teacher's Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Unselected classes at each of the following: 6th grade, Orange, Conn.; 6th grade, Hamden, Conn.; 6-10th grade, Yale-North Haven, Conn.; 4-6th grade, Palo Alto, Calif.; 7-9th grade, Palo Alto, Calif."

Prerequisites:
Additional material required: Logic cubes, playing mats, timer (all included with the WFF 'N PROOF kit).
Average Time: "Difficult to say. It may take years to become a good player of WFF 'N PROOF, somewhat like bridge or chess."
Next Revision: June, 1963.
(2 sample pages)
MATHEMATICS - LOGIC

WFF 'N PROOF
Allen; SCIENCE RESEARCH ASSOCIATES
2 sample pages:

4 Np?

* Yes. (Np (1) 'p' is a WFF by clause 1 (C1).
   (2) Since 'p' is a WFF, 'Np' is a WFF by clause 2 (C2).

   In other words: WFFs Reasons
   (1) p C1
   (2) Np 1. C2

5 NNq?

* Yes. (NNq 'Nq' WFFs Reasons
   (1) q C1
   (2) Nq 1, C2
   (3) NNq 2, C2

   The reason '1, C2' indicates that since 'q' is a WFF in Step 1, 'Nq' is a WFF by C2. The reason '2, C2' indicates that since 'Nq' is a WFF in Step 2, 'NNq' is a WFF by C2.

The underlined parts in 'Np' and 'NNq' of the answers to questions 4 and 5 are WFFs containing two or more letters. The expressions 'Np' and 'Nq' are 2-letter WFFs, and the expression 'NNq' is a 3-letter WFF. Any given expression comprised of two or more letters can be tested to determine whether or not it is a WFF by underlining every part (the whole is also a part) of that expression that is a WFF comprised of two or more letters. When tested by such an underlining procedure, a given two-or-more-letter expression is a WFF if and only if the entire expression gets underlined by one line. For example:

'CpNq' is a WFF.

'ANrNs' is a WFF.

'ANrCpNq' is a WFF.
WFF 'N PROOF (sample of program)

**Definition of a WFF**

A given expression is a WFF if and only if

- it is a 'p', 'q', 'r', or 's'; or
- it is the expression formed when 'N' is immediately followed by exactly one WFF; or
- it is the expression formed when a 'C', 'A', 'K', or 'E' is immediately followed by exactly two WFFs.

According to the definition of a WFF, is the expression 'p' a WFF? The answer to this question is "Yes." Hereafter, such questions will be abbreviated. The expression 'p?' appearing in the left column on a page will be an abbreviation for the question "Is the expression 'p' a WFF?" The answer to the question will appear in the right column enclosed in asterisks. Sometimes, immediately following the answer, there will be some further explanation enclosed in parentheses.

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>ANSWERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 p?</td>
<td>Yes.</td>
</tr>
<tr>
<td></td>
<td>('p' is a WFF by clause 1 (C1) of the definition of a WFF.)</td>
</tr>
<tr>
<td>2 o?</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td>(There is no clause in the definition of a WFF that indicates that an expression that contains an 'o' is a WFF, and a given expression is a WFF only if it is a WFF by one of the clauses of the definition.)</td>
</tr>
<tr>
<td>3 pq?</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td>(There is no clause in the definition of a WFF that indicates that an expression comprised of two WFFs is a WFF.)</td>
</tr>
</tbody>
</table>