A GUIDE FOR TEACHING THE MATHEMATICS

OF THE COMMUNITY IN A SOCIALIZED CURRICULUM

FOR THE JUNIOR HIGH SCHOOL

A THESIS

SUBMITTED TO THE DEPARTMENT OF

EDUCATION AND THE GRADUATE COUNCIL OF THE KANSAS

STATE TEACHERS COLLEGE OF EMPORIA IN PARTIAL

FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

By

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P. A. Y.

# TABLE OF CONTENTS

# LIST OF TABLES

# CHAPTER I

## INTRODUCTION

### 1. The Nature of the Study

In America we have placed our faith in the guiding concepts of democracy. Democracy requires that people, individually and collectively, must be responsible for the progress and preservation of their nation. In such a democracy the responsibility of the schools is great. Education must contribute to the direction of social development. Its contribution does not lie in passing on certain skills and bits of information entirely isolated from anything else. Its contribution lies in giving people help to solve the problems they meet and in directing the individual towards desirable ways of living in a democratic society. Or more specifically, as Professor Hullfish points out, the school must launch a positive program for dealing with the present confusion, both within and without the school by considering its reorganization in the following ways:

1. It is reasonable to expect the school progressively to orient the student in the life of which he is a part.

2. It is reasonable to expect the school to provide situations for the purpose of leading the student progressively to direct his action by an integrated and unified attitude to which he increasingly gives his allegiance.

3. It is reasonable to expect the school to encourage the development of independent interests, intellectual, esthetic, or practical, on the part of its students.

4. It is reasonable to expect the school to set up an environment in which all of its members, through active participation in its organization and control, may move progressively to a more complete appreciation of the deeper significance of the democratic way of life.

5. It is reasonable, finally, to expect the school to
   face frankly the fact that it will not contribute sig-
   nificantly to the reconstruction of the social process
   until it launches a positive program of experimentation
   directed toward the reconstruction of its own procedures.[1]

Mathematics perhaps more than any other "subject" has tended to
retain its compartmentalization. Mathematics has its social values but
these have been subordinated to the solving of isolated problems. Hence
the writer has as his main objective the presentation of suggestions for
the part that mathematics should play in the creation of a socialized
curriculum at the junior high school level. As a guide it will be ready-
made; however, the suggestions it contains will be intended for a curricu-
lum always in the process of development.

## 2. Previous Studies

An examination of various textbooks and courses of study for
Junior High Mathematics shows them to contain approximately the same
content and arrangement of materials. The general objectives outlined in
the courses of study are mathematical rather than social. That is, they
have emphasized perfection in the arithmetic processes of an isolated
system. The problem of fusing arithmetic, intuitive geometry, algebra,
and simple elements of trigonometry into integrated courses for the three
years of junior high school has held the interest of the majority of edu-
cators. Regardless of such integrated courses that have been practically

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[1] W. H. Kilpatrick and others, The Educational Frontier. New York:
D. Appleton-Century Company, 1933. p. 165.

perfected, the emphasis has still been upon the solving of isolated

problems that hold little real life meaning for the pupils.

An attempt has been made by Kenneth Skeen in his study "An Out-

line of a Half-Year Course for Seventh Grade Mathematics Based on a

Study of Home Budgeting" to vitalize the relation of mathematics to every-

day affairs.[2] His study has two purposes: first, through the method of

its content to supply the general mathematical concepts essential to the

early part of the junior high school level and second, in developing these

mathematical understandings it was purposed that they shall involve from

their very nature practical and real life situations.

Dr. Lull, in his book, Principles of Elementary Education, devotes

a chapter to arithmetic in the intermediate grades.[3] His outline of how

a personal-life budget should function in the life of a pupil will be re-

ferred to in connection with this study.

Other reports on projects and surveys having some relation to this

study will be referred to from time to time.

### 3. The Scope of the Study

The relations of the community, state relations, national relations,

and international relations all represent major areas of socially signifi-

cant relationships. This study is limited to the community, the primary

area of social relations.

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[2] Kenneth Skeen, An Outline of a Half-Year Course for Seventh Grade
Mathematics Based on a Study of Home Budgeting. Unpublished Master's Thesis,
Kansas State Teachers College, Emporia, Kansas, 1933.

[3] H. G. Lull, Principles of Elementary Education. New York: W. W.
Norton and Company, Inc., 1935. Chapter 17.

Emphasis will be placed upon the mathematics of the home, school, and church, the basic institutions of the community. Included with this also will be the mathematics of housing, recreation, health, business-consumer relationships, and other items in terms of community situations.

This study is a guide intended for use by the teachers of mathematics in the junior high school. Much of the material, however, is applicable to the senior high school level.

### 4. Sources of Data and Method of Procedure

The city budget for Dodge City, Kansas, was obtained through the courtesy of E. C. Hathaway, former city clerk of Dodge City.

The school budget for the Dodge City Public Schools was obtained through the courtesy of A. C. Schroedermeier, Superintendent of Schools.

The church budget was secured from the financial secretary of the First Methodist Church, Emporia, Kansas.

These budgets, whole or in part, were used to illustrate how the finances of the city, the school, and the church should be studied in terms of the curriculum objective, citizenship efficiency.

### 5. Definition of Terms

A socialized curriculum refers to a curriculum having objectives that are social, social in the sense of preparing the pupil to take a more helpful part in the society in which he lives.

Curriculum objectives is a term that refers to those aims or goals

representing a central emphasis in the interrelated objectives of life
and the curriculum.

### 6. Presentation of Data

This study is essentially a unit guide for the teaching of
mathematics in a socialized curriculum. One or more units have been
developed under each of these curriculum objectives, citizenship effi-
ciency, health efficiency, language efficiency, home-life efficiency,
leisure-time efficiency, and vocational efficiency, emphasized in the
junior high school.[4]

4 H. G. Lull, _Secondary Education, Orientation and Program_. New
York: W. W. Norton and Company, Inc., 1932. Chapter XI.

# CHAPTER II

## MATHEMATICS OF THE COMMUNITY IN TERMS OF
## THE CURRICULUM OBJECTIVE, CITIZENSHIP EFFICIENCY

If education is to prepare our people for the duties of citizenship there must be developed, first of all, an educational program specifically planned to aid our people in meeting the problems they face in their primary area of experience, the community. The curriculum objective, citizenship efficiency, represents a central emphasis on citizenship activities with a view of improving the inter-relationships of the home, the school, the church, business, industry, the professions, and other social agencies.*

### Unit I

A. Intermediate Objective: To understand the essential relations within the home with the view of making the home a better place in which to live for all the members of the family

1. Specific Objectives

   a. To introduce the concepts of total, account, graph, average, balance, error, maximum, and minimum

   b. To gain information relating to the elements of a home budget

   c. To develop skill in performing those arithmetic abilities per-

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* For the source of this objective and the remaining curriculum and intermediate objectives used in this study, reference must be made to the General Guidance Bulletin for Schools of East Central Kansas Cooperating in the Improvement of the Curriculum. Department of Education, Kansas State Teachers College, Emporia, Kansas, Volume II, March, 1936.

taining to the fundamental operations, per cent, denominate

numbers, making and interpreting graphs and tables, and

personal accounts

B. Suggestions for pupil activity and teaching procedure: This unit

will show how mathematics can be put to work within the child's basic

area of experience, the home. By the time the pupil has reached the

seventh grade he should have learned from his own personal experiences

the value of money. Perhaps he has even learned how to budget his

earnings and allowances. Dr. Lull in his book on elementary education

shows how a project in a personal life budget can actually put arith-

metic to work within the child's own area of experience starting in

the elementary grades.[1] It will not be the purpose of this unit to

outline any project in personal budgeting as a reference to Dr. Lull's

book should give the teacher a satisfactory outline for suggestions

on a personal life budget for the pupil. This work should precede a

study of the home budget. The main divisions of the home budget and

the order in which they shall be studied are: food, clothing, shelter,

savings, and miscellaneous.

According to Dr. H. G. Lull,[2] home budgeting efficiency presupposes

an adequate knowledge of home buying and consumption. Using this as a

point of departure have the pupils list all the different foods used in

the home. These lists should be combined into a general list for the whole

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[1] Herbert G. Lull, Principles of Elementary Education. New York:
W. W. Norton and Company, Inc., 1935. Pp. 408-427.

[2] Herbert G. Lull, Secondary Education. New York: W. W. Norton
and Company, Inc., 1932. P. 204.

class. The pupils should take this list home where they can work out
with their parents the average amount of each item of food bought and
the cost of refrigeration for a period of one week. Other data needed
will be the number of persons in the family and the family income. Then
the class as a whole should make out a price list using local food prices.
With this data a table should be made containing the food items, the
weekly amount of each consumed, the cost per unit, the cost of refrigera-
tion, and a column for totals. The table heading can include the family
income and the number of persons in the family. Typical problems that
should be worked out are as follows:

1. Find the total cost of food for one week; for one year.

2. What per cent of the total is spent for bread? For eggs?

3. Counting all children below twelve years of age in your
   family as equal to one-half an adult, find what per cent of
   the total is spent for each person in the family.

4. Make a line graph showing the relative amounts spent for
   various food items.

5. What per cent of the family income is spent for food?

In studying the consumption of foods and the relationship of
expenditures for food to the total expenditures of the home, statistics
gathered from various surveys, especially those conducted by the Bureau
of Labor Statistics, should be studied by the class for the purpose of
comparing with their own findings. Those surveys that make a study of
the consumption of foods at different economical levels are especially
useful in this respect.

Expenditures for clothing replacement and upkeep will be the second consideration in dealing with the divisions of the home budget. The basic activity centers on a study of the average annual amounts spent for clothing in relation to the total yearly income.

First have the pupils make a list of articles of clothing worn by members of the family; also a list of upkeep expenses as cleaning and repairing. Combine these lists and organize the items in an outline or form that can readily be filled in by the pupil with the aid of his parents. The following form suggests an itemized clothing account that can be worked out for the male members of the household. It is arranged so that it may be continued to include the rest of the members of the entire family.

# A SUGGESTED ITEMIZED CLOTHING ACCOUNT
## FOR THE MALE MEMBERS OF A HOUSEHOLD

| Member of Family | Article of Clothing | Number of Replacements | Price per Unit | Total Upkeep | Total Yearly Cost |
|---|---|---|---|---|---|
| Adult (father) | Hat | 2 | $3.00 | $.75 | $6.75 |
|  | Ties | 4 | 1.00 | .40 | 4.40 |
|  | Suits |  |  |  |  |
|  | Shirts |  |  |  |  |
|  | Underclothing |  |  |  |  |
|  | Socks |  |  |  |  |
|  | Shoes |  |  |  |  |
|  | Overcoat |  |  |  |  |
|  | Pajamas |  |  |  |  |
|  | Gloves |  |  |  |  |
|  | Handkerchiefs |  |  |  |  |
|  | Miscellaneous |  |  |  |  |
| Total yearly cost for adult (father) |  |  |  |  |  |

Adult (mother)

After the total yearly cost of clothing has been found the central problem is to determine what per cent of the yearly income is spent for clothing and upkeep for the entire family for a period of one year. A check that the pupils should use on the per cent thus found is suggested by the following table. This table is extracted from a compilation included in a report of the Heller Committee for Research in Social Economics, of the University of California.[3]

[3] California, University of. Heller Committee for Research in Social Economics. Quantity and Cost Budgets. Berkeley, February, 1935, (Mimeographed), cited by Monthly Labor Review, 40:1387, May, 1935.

## TABLE I

### FAMILY BUDGETS FOR EXECUTIVE, CLERK, AND WAGE EARNER, BASED ON PRICES IN SAN FRANCISCO, NOVEMBER, 1934

| Item | Executive | | Clerk | | Wage Earner | |
|------|-----------|-----------|-------|-----------|-------------|-----------|
| | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost |
| Total Cost | $5590.88 | 100.0 | $2033.41 | 100.0 | $1544.16 | 100.0 |
| Clothing and Upkeep | 705.94 | 12.6 | 360.24 | 17.7 | 226.56 | 14.7 |
| Man | 198.66 | 3.5 | 99.77 | 4.9 | 63.06 | 4.1 |
| Replacements | 179.32 | 3.2 | 92.92 | 4.6 | 59.60 | 3.9 |
| Upkeep | 19.34 | .3 | 6.85 | .3 | 3.46 | .2 |
| Wife | 329.49 | 5.9 | 119.09 | 5.9 | 61.26 | 4.0 |
| Replacements | 322.90 | 5.8 | 115.99 | 5.7 | 58.82 | 3.8 |
| Upkeep | 6.59 | .1 | 3.10 | .2 | 2.44 | .2 |
| Boy of 11 | 89.68 | 1.6 | 57.65 | 2.8 | 83.05 | 2.8 |
| Replacements | 83.88 | 1.5 | 53.53 | 2.6 | 38.81 | 2.5 |
| Upkeep | 5.80 | .1 | 4.12 | .2 | 4.24 | .3 |
| Girl of 5 | 88.11 | 1.6 | 44.54 | 2.2 | 32.30 | 2.1 |
| Boy of 2 | ------ | --- | 39.19 | 1.9 | 26.89 | 1.7 |

Read Table thus: The total yearly cost of an executive's family budget is $5590.88, represented by 100 per cent; of a clerk's budget, $2033.41, also represented by 100 per cent, etc. The annual cost of clothing and upkeep for the executive family budget is $705.94, represented as 12.6 per cent of the total annual cost; for the clerk's budget, $360.24, represented as 17.7 per cent of the total annual cost, etc.

Expenditures for shelter will be the third consideration in dealing with the divisions of the home budget. The basic activity will be a study of the average annual amount spent for shelter in relation to the total yearly income.

The pupils should make an individual list of the expenses of shelter. When a general list is made by combining the items of the individual lists, the shelter expenses, for convenience, should be divided under at least three main headings. The headings suggested are housing, operation expenses, and furnishings. For housing the pupil will have to determine whether his parents own their home, rent a house, or are paying for a home on an installment plan.

If the home is owned by the parents the pupil should figure the cost separately, of taxes, interest on investment, insurance, and repairs. The total of these expense items determines the total housing expense.

If the parents rent a home, the problem of housing expense is simple as the only expense involved is that of yearly rent.

If the house is bought on the installment plan, the yearly payments plus carrying charges will have to be included with the regular expenses of owning a home.

Under the next heading, house operation, will be included such items as light, fuel, telephone, servants and miscellaneous. The pupil should find the total expense for operation and then under the third heading, furnishings, determine as nearly as possible the average yearly amount spent in his home for furniture and furnishings. After the total yearly amount spent for shelter has been found, the central problem is to determine what

per cent of the yearly income is spent for shelter. A check that the
pupils should use on the per cent thus found is suggested by the follow-
ing table. This table and similar tables should be used by the pupil
for a comparison with his own findings. The table is extracted from a
compilation included in a report of the Heller Committee for Research in
Social Economics of the University of California.[4]

| Item | Annual Cost | Annual Cent | Annual Cost | Per Cent | Annual Cost | Per Cent |
|---|---|---|---|---|---|---|
| Total costs | | | | 100.0 | | 100.0 |
| Shelter | | | | | | |
| Heating | | | | | | |
| House operation | | | | | | |
| Light and fuel | | | | | | |
| Service | | | | | | |
| Other | | | | | | |
| Furniture | | | | | | |

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[4] *Ibid.*, p. 1387.

TABLE II

FAMILY BUDGETS FOR EXECUTIVE, CLERK, AND WAGE EARNER,
BASED ON PRICES IN SAN FRANCISCO, NOVEMBER, 1934

| Item | Executive | | Clerk | | Wage Earner | |
|---|---|---|---|---|---|---|
| | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost |
| Total cost | $5590.88 | 100.0 | $2033.41 | 100.0 | $1544.16 | 100.0 |
| Shelter | 1741.16 | 31.1 | 568.26 | 27.9 | 449.68 | 29.1 |
| Housing | 929.51 | 16.6 | 330.00 | 16.2 | 270.00 | 17.5 |
| House opera-tion | 569.82 | 10.2 | 154.56 | 7.6 | 123.90 | 8.0 |
| Light and fuel | 180.88 | 3.2 | 88.84 | 4.4 | 78.40 | 5.1 |
| Service | 217.88 | 3.9 | ------ | ---- | ------ | ---- |
| Other | 171.06 | 3.1 | 65.72 | 3.2 | 45.50 | 2.9 |
| Furniture | 241.83 | 4.3 | 83.70 | 4.1 | 55.78 | 3.6 |

Read Table thus:  The total yearly cost of an executive's family budget
is $5590.88, represented by 100 per cent.  The annual cost of shelter
for the executive's budget is $1741.16, represented as 31.1 per cent of
the total annual cost, etc.

The mathematical aspect of savings includes a study of how much
is put into savings or investments and what the yield or return is to
the investor.

The teacher should work out with the pupils a list of ways wherein
money can be invested. This list should include savings accounts, postal
savings, insurance, real estate, building and loan associations, stocks
and bonds. The majority of the pupils will discover that insurance is
the most popular way their parents have of investing money. The pupils
should determine as nearly as possible the yearly cost of insurance and
other investments their parents may have. The amount of income from any
investment should be studied in its relation to the amount invested;
otherwise, its only other relation to the family budget will be its in-
clusion as a part of the total yearly income. Another problem that should
be mentioned regards savings merely lying idle. If a pupil's family
should have any savings, have him figure the possible yearly income de-
rived from a good investment of such savings.

The central problem is to find what per cent of the yearly income
is used for savings and investments. Miscellaneous items not mentioned
so far in the home budget and the determination of the yearly expense of
these items will be the last consideration in a study of the mathematics
of home budgeting.

Donations to the church and for charity should be included as one
item. The pupil should easily determine how much is spent at home for con-
tributions.

The upkeep on an automobile is another item that should be con-

sidered. The initial cost and depreciation may be taken into account if that is the desire of the teacher. Carfare, if not counted as a separate item, could be combined with the upkeep expenses on an automobile under the general heading, transportation.

For medical care there is a question of how much to allow for a year because of the variability of the expense. A safe procedure should be to determine the cost of routine care and let savings take care of the expense of major operations and prolonged illnesses.

Leisure-time activities will include the expenses for entertainment, sports activities and any other incidentals that the teacher and pupils may decide upon as coming under this item.

Unless each member of the family has a personal budget another expense item that should be mentioned is care of the person. The main expense will be for toilet articles for the individual.

Another item for which expenses vary greatly is education and advancement. Books for the home library, magazines and newspapers, lodge, association, or club dues, and all school expenses for the children are included under education.

The list of miscellaneous items mentioned above is not intended to be a complete list. Some homes may have expenses that other homes do not have. All expenses of the home, however, should be included in the home budget. The central problem is to find what per cent of the total income is spent for the total of the miscellaneous items. A check that the pupils should use on the per cent thus found is suggested by the following table. This table and similar data should be used by the pupil for a comparison

with his own findings. The table is extracted from a compilation included in a report of the Heller Committee for Research in Social Economics, of the University of California.[5] Investment and life insurance was included under miscellaneous by the Heller Committee.

[5] *Ibid.*, p. 1387.

## TABLE III

### FAMILY BUDGETS FOR EXECUTIVE, CLERK, AND WAGE EARNER, BASED ON PRICES IN SAN FRANCISCO, NOVEMBER, 1934

| Item | Executive | | Clerk | | Wage Earner | |
|---|---|---|---|---|---|---|
| | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost | Annual Cost | Per Cent of Annual Cost |
| Total Cost | $5590.88 | 100.0 | $2033.41 | 100.0 | $1544.16 | 100.0 |
| Miscellaneous | 2258.68 | 40.4 | 505.48 | 24.9 | 371.16 | 24.0 |
| Care of person | 89.35 | 1.6 | 47.15 | 2.3 | 39.27 | 2.5 |
| Recreation | 487.41 | 8.7 | 170.20 | 8.4 | 123.76 | 8.0 |
| Car Upkeep | 444.79 | 8.0 | ------ | ---- | ------ | ---- |
| Investment | 620.00 | 11.1 | ------ | ---- | ------ | ---- |
| Carfare | 40.00 | .7 | 60.00 | 2.9 | 45.00 | 2.9 |
| Life Insurance | ------ | ---- | 130.00 | 6.4 | 65.00 | 4.2 |
| Medical care | 275.00 | 4.9 | 75.00 | 3.7 | 75.00 | 4.9 |
| Association dues | 36.00 | .6 | ------ | ---- | ------ | ---- |
| Education | 101.13 | 1.8 | 5.13 | .3 | 5.13 | .3 |
| Church and charity | 105.00 | 1.9 | 18.00 | .9 | 18.00 | 1.2 |
| Incidentals | 60.00 | 1.1 | ------ | ---- | ------ | ---- |

Read Table thus:  The total yearly cost of the executive's family budget is $5590.88, represented by 100 per cent.  The total annual cost of miscellaneous for the same family is $2258.68, represented as 40.4 per cent of the total annual cost.  Read in like manner for other items.

The pupils now have all the data available to make a circle graph of the expenditures of the home. Perhaps the pupils will desire to outline a home budget for the coming year, using what they've already worked out in this unit as a partial basis for the project. The ensuing budget would also have to be based upon other proposed expenditures of the family for the coming year. If such a project is undertaken, the writer suggests that parts of the budget, for example, the food division , be worked out in accordance with the curriculum objective, health effi-ciency. Chapter III of this study presents a unit showing how a food budget can be worked out in terms of a balanced diet at a low cost.

## Unit II

A. Intermediate objective: To understand the essential social relations within the school with the view of making the school a better institu-tion for carrying out its major purposes

1. Specific Objectives

   a. To introduce the concepts of graph, budget, financial statement, balance, receipts, disbursements, funds, and total

   b. To gain information relating to the items of a school budget and financial statement

   c. To develop skill in performing those arithmetic abilities per-taining to the fundamental operations, per cent, and the making and interpretation of tables, graphs, and budgets

B. Suggestions for pupil activity and teaching procedure: The purpose of this unit will be, first, to study the cost of maintaining the public

schools, and secondly, to consider how money is raised to maintain these schools. The mathematics involved will center on a study of the school budget.

For the first activity the pupils should list all the expenses they can think of included in the cost of maintaining the public schools. Then it will be the teacher's responsibility to arrange these expense items and add some if necessary so that the pupils will have a list corresponding to the items in the actual school budget. It will be the pupils' task to do what they possible can towards making a proposed budget for the ensuing year. How this can be done will be illustrated in the following outline.

It will be most desirable, first, to have mimeographed sheets passed to the pupils including their rearranged list of expense items, the actual amount spent for each item in the past year and a column left blank for the proposed expenses for each item. This budget form (as it shall be termed throughout the remainder of the outline) should closely resemble the following form. The data for this form was obtained through the courtesy of A. G. Schroedermeier, clerk of the board of education, Dodge City, Kansas.

# PROPOSED BUDGET FOR THE YEAR 1937 FOR THE DODGE CITY SCHOOLS

| Expense Items | Expenses for the Year 7-1-35 to 6-30-36 | Proposed Budget Ensuing Year 7-1-36 to 6-30-37 |
|---|---|---|
| **GENERAL FUND** | | |
| **General Control:** | | |
| Secretary's Office, Salaries . . . . . . . . . . | $ 1,510.12 | ---------- |
| Secretary's Office, Supplies . . . . . . . . . | 771.57 | ---------- |
| Salary of Superintendent . . . . . . . . . . . | 3,000.00 | ---------- |
| Auditing . . . . . . . . . . . . . . . . . . . | 150.00 | ---------- |
| Legal Service . . . . . . . . . . . . . . . . | 225.00 | ---------- |
| Publications . . . . . . . . . . . . . . . . . | 125.19 | ---------- |
| Compulsory Education . . . . . . . . . . . . . | 307.85 | ---------- |
| **Instructional Service:** | | |
| Salaries of Principals . . . . . . . . . . . . | 6,292.20 | ---------- |
| Salaries of Teachers . . . . . . . . . . . . . | 83,202.55 | ---------- |
| Substitute Teachers . . . . . . . . . . . . . | 290.68 | ---------- |
| Physical Education Salaries and Supplies . . | 3,166.15 | ---------- |
| Manual Training Salaries and Supplies . . . | 3,197.28 | ---------- |
| Domestic Science Salaries and Supplies . . . | 2,783.77 | ---------- |
| Clerical Hire . . . . . . . . . . . . . . . . | 1,426.05 | ---------- |
| Instructional Supplies . . . . . . . . . . . . | 4,040.49 | ---------- |
| Commencement . . . . . . . . . . . . . . . . | 321.82 | ---------- |
| Miscellaneous . . . . . . . . . . . . . . . . | 98.77 | ---------- |
| **Operation of School Plant:** | | |
| Wages of Janitor . . . . . . . . . . . . . . | 7,071.59 | ---------- |
| Fuel . . . . . . . . . . . . . . . . . . . . | 3,843.05 | ---------- |
| Water, Light, Power . . . . . . . . . . . . | 3,630.40 | ---------- |
| Janitor Supplies . . . . . . . . . . . . . . | 1,408.49 | ---------- |
| Other expenses . . . . . . . . . . . . . . . | 58.85 | ---------- |
| Service other than Personal . . . . . . . . | 101.75 | ---------- |
| **Auxiliary School Agencies:** | | |
| Libraries . . . . . . . . . . . . . . . . . . | 1,835.04 | ---------- |
| Music Department Supplies . . . . . . . . . | 488.07 | ---------- |
| Health Service . . . . . . . . . . . . . . . | 6.60 | ---------- |
| Transportation . . . . . . . . . . . . . . . | 387.03 | ---------- |
| Vocational Education . . . . . . . . . . . . | 289.80 | ---------- |
| Music-Equipment . . . . . . . . . . . . . . | 0.00 | ---------- |

PROPOSED BUDGET FOR THE YEAR 1937 FOR THE DODGE CITY SCHOOLS

(Continued)

Other Expenses:

| | | |
|---|---|---|
| New Equipment . . . . . . . . . . . . . . | 2,360.23 | ---------- |
| Repairs to Equipment . . . . . . . . . . | 363.91 | ---------- |
| Special Tax Assessments . . . . . . . . . | 1,308.28 | ---------- |
| Rents . . . . . . . . . . . . . . . . . . | 12.00 | ---------- |
| Insurance . . . . . . . . . . . . . . . . | 940.08 | ---------- |
| Enrollment Accrediting Agencies, etc . . . | 40.00 | ---------- |
| Replacement of Industrial Equipment . . . | 503.10 | ---------- |
| TOTAL GENERAL FUND . . . . . . . . . . . . | $135,449.76 | ---------- |

BUILDING FUND

Maintenance:

| | | |
|---|---|---|
| Upkeep of Grounds . . . . . . . . . . . . | 3.00 | ---------- |
| Repairs to Buildings . . . . . . . . . . | 1,129.19 | ---------- |
| Replacement of Building Equipment . . . . | 185.50 | ---------- |

Capital Outlay:

| | | |
|---|---|---|
| Building Alterations and Improvement . . . | 2,341.68 | ---------- |
| Heat, Lighting, and Plumbing . . . . . . | 471.35 | ---------- |
| Furniture and Equipment . . . . . . . . . | 1,392.15 | ---------- |
| TOTAL BUILDING FUND . . . . . . . . . . . | $6,522.77 | ---------- |

BOND AND INTEREST FUND

| | | |
|---|---|---|
| Bond Principal . . . . . . . . . . . . . . | 51,227.24 | ---------- |
| Maturing Interest Coupons . . . . . . . . | 23,080.40 | ---------- |
| Commission to Fiscal Agency . . . . . . . | 70.75 | ---------- |
| TOTAL BOND AND INTEREST FUND . . . . . . . | $74,378.39 | ---------- |

From here the most desirable procedure is to have the pupils gather all the data they possibly can to use as a basis for an estimation of expenses for the ensuing year. The teacher should collect the data and organize it on the basis of making out a series of problem sheets that the pupils will use as a guide in working out the proposed budget. For illustration consider the outline of the following problem sheet worked out for one

division of the budget, operation of the school plant;

## Operation of the School Plant

Problem 1. To find the total yearly amount to be allowed for the salaries of the janitors. (The data that the teacher has organized for this item will be included with the statement of the problem, giving the pupils a basis for determining the amount to be allowed for wages. This amount should be recorded in its proper place in the budget form.)

Problem 2. To find the total yearly amount to be allowed for fuel. (The amount allowed for this item and the items in the following problems will be determined as in problem 1.)

Problem 3. To find the total yearly amount to be allowed for water, light, and power.

Problem 4. To find the total yearly amount to be allowed for janitor's supplies.

Problem 5. To record the amount to be allowed for other expenses.

Problem 6. To record the amount to be allowed for services other than personal.

The last two items in the group above illustrate problems found throughout the budget for which the teacher will have to specify the a-mounts to be allowed. If the work on the school budget precedes the actual proposed budget made out by the clerk then the teacher will have to specify any amount for such items as she thinks will be reasonable. If the work on the school budget is taken after the actual proposed budget

has been established then the amount allowed for all the items of the
pupil's budget should correspond to the amounts allowed in the actual
budget. This means that the problem sheets will have to have been care-
fully organized by the teacher.

After the amounts allowed for each item in the entire budget
have been recorded, further problems suggested for work in the budget
are:

1. Find the total amount to be allowed for maintaining the
   public schools.

2. Find the number of pupils enrolled in the public school system
   and determine the per capita cost for each pupil in 1936 and
   1937. Find the per cent increase or decrease of the per capita
   cost. What is the per capita cost of each of the subjects of the
   curriculum? Of the extra-curricular activities?

3. What per cent of the total cost in 1936 was spent for teachers'
   salaries? To be spent for 1937?

4. Procure the expenses for maintaining the schools each year for
   the past ten years and make a graph. Do the same for pupil en-
   rollment; for per-capita cost of the pupils.

The second purpose of this unit is to consider how money is raised
to maintain the public schools. The pupils should list the various
methods of taxation. The teacher should revise the list to correspond to
the receipts established in the actual financial statement. The amounts
for the receipts and disbursements will have to be given to the pupils by
the teacher. The central problem is to find the school district treasurer's

balance for the preceding year. The following financial statement, included with the Dodge City, Kansas, Public School Budget, suggests a form for determining the treasurer's balance:

## FINANCIAL STATEMENT--CURRENT YEAR

| Receipts: | General Fund | Building Fund | Bond and Interest Fund |
|---|---|---|---|
| School District Treasurer's Balance 7-1-35 . . . . . . . . | $ 74,406.50 | $2,765.27 | $ 2,877.45 |
| Ad Valorem Taxes . . . . . . . . | 54,385.25 | 5,879.08 | 75,616.85 |
| Intangible Taxes . . . . . . . | 1,007.58 | | |
| Dog Tax . . . . . . . . . . . . | 239.50 | | |
| Barnes Aid . . . . . . . . . . | 48,410.53 | | |
| Other Tuition . . . . . . . . | 700.00 | | |
| State and County Aid . . . . | 2,004.60 | | |
| Vocational Aid . . . . . . . . | 242.00 | | |
| Miscellaneous . . . . . . . . | 317.61 | | |
| Refunds . . . . . . . . . . . | | | 14.83 |
| TOTAL RECEIPTS . . . . . . . . | $181,713.57 | $8,644.35 | $78,509.13 |

Disbursements:

| | General Fund | Building Fund | Bond and Interest Fund |
|---|---|---|---|
| Prior Year's Warrants . . . | 924.92 | | |
| Current Year's Warrants . . . | 133,727.44 | 5,655.19 | 74,378.39 |
| Refund to Building Fund . . | 157.57 | | |
| TOTAL DISBURSEMENTS . . . . | $134,809.93 | | |
| School District Treasurer's Balance 6-30-36 . . . . . . | $ 46,903.64 | $2,989.16 | $ 4,130.74 |

This unit has suggested a procedure for studying the school budget. The same procedure should be used when mathematics is enlisted to manage the finance of any of the school activities that demand budgeting or the handling of funds.

## Unit III

A. Intermediate Objective:  To understand the essential social relations
   within the church with the view of making it a more effective institu-
   tion in developing the good life

   1. Specific Objectives

      a. To introduce the concepts of per cent, budget, total, table,
         graph, and balance

      b. To gain information relating to the items of a church budget

      c. To develop skill in performing those arithmetic abilities per-
         taining to the fundamental operations, per cent, and the making
         and interpretation of tables, budgets, and graphs

B. Suggestions for teaching procedure and pupil activity:  Pupil activity
   should be based upon a study of the finances of the church.  From a
   mathematical viewpoint this means a study of the church budget.

   To introduce the unit, have the pupils list all of the expenses they
can think of involved in financing a church.  After a standardized list has
been agreed upon, collect copies of the various budgets for each church in
the community.  If the teacher wishes, she may have the pupils make out a
proposed budget for the ensuing year as was the plan already discussed in
working out the school budget.  This procedure presumes that enough data
can be gathered to make such a proposed budget.  However, a more feasible
plan might be to make a comparative study of the various church budgets.
For example, consider the following budget for the First Methodist Church,
Emporia, Kansas, obtained through the courtesy of the financial secretary:

## BUDGET FOR 1937-1938

|                              |            |
|------------------------------|-----------:|
| Pastor's Salary              | $3750.00   |
| Conference Claims            | 900.00     |
| Janitor                      | 960.00     |
| Financial Secretary          | 600.00     |
| Music                        | 650.00     |
| Insurance                    | 550.00     |
| Fuel                         | 300.00     |
| Lights                       | 140.00     |
| Maintenance                  | 100.00     |
| Duplex Envelopes             | 27.00      |
| Water                        | 20.00      |
| Supplies                     | 175.00     |
| Postage                      | 100.00     |
| Religious Education          | 20.00      |
| Scouts                       | 50.00      |
| Miscellaneous                | 50.00      |
| Personal Repairs             | 200.00     |
| Conference Benevolences      | 750.00     |
| General Conference           | 20.00      |
| World Service                | 1440.00    |
|                              | $10602.00  |

The pastor's salary, heading the list, is an item that occurs in any church budget. Questions similar to the following should be considered:

1. Find the differences in the salaries of the pastors of the various churches.

2. What per cent of the total is spent for the pastor's salary of the First Methodist Church? For the other churches?

3. Make a graph showing the percentages found in problem 2.

4. Choose other items that appear in all the budgets and make a comparative study of the amount spent for these items after the plan of the first three problems in this list.

Besides a study of the various church budgets, other problems also concerning the church should be studied. Statistical data for church and

Sunday-school attendance should be used to answer the following problems:

1. What is the per cent of attendance of your Sunday-school class over a period of Sundays? For the whole Sunday-school?

2. Start a graph of the attendance of your Sunday-school class and continue it for a year. It would be interesting also, to know how the sales of Bibles compare with the sales of other books.

Most of the pupils understand that the money for financing the church is raised by pledges. They should understand, also, how other methods such as church dinners, rummage sales, subscription, and entertainments, are used to raise money. The church money is handled by the finance committee of the church. This should not be confused with the Sunday-school department which has its own fund.

## Unit IV

A. Intermediate Objective: To understand the organization and major problems of the local municipal government in the construction of streets; in developing and maintaining efficient police and fire protection; in the construction of the system and administration of the water supply; in city planning, finance, etc.

1. Specific Objectives

   a. To introduce the concepts of budget, graph, financial statement, balance, receipts, total, funds, and disbursements

   b. To gain information relating to the items of a city budget

   c. To develop skill in performing those arithmetic abilities pertaining to the fundamental operations, per cent, and the making and

Interpretation of graphs, tables, and budgets

B. Suggestions for pupil activity and teaching procedure: The purpose

of this unit will be to study the finance problems of maintaining

the city government in terms of the city budget. This will involve,

first, a study of the cost of maintenance, and secondly, a considera-

tion of how money is raised to support the maintenance costs.

The pupils should list all the expenses they can think of as being

included in the cost of financing the city management and maintance. The

pupils, with the aid of the teacher, should combine their lists and or-

ganize a table of expense items corresponding to the items of the actual

city budget. It shall be the pupil's task to make out a budget for the

ensuing year. How this can be done will be illustrated in the following

outline.

It will be most desirable, first, to have mimeographed sheets given

to the pupils that should include the rearranged list of expense items,

the actual amount spent for each item in the past year or two, and a column

left blank for the proposed expenses for each item. This budget form should

closely resemble the following form. The data for this form was obtained

through the courtesy of E. C. Hathaway, former city clerk of Dodge City,

Kansas.

# PROPOSED BUDGET FOR THE YEAR 1937, CITY OF DODGE CITY

## By the Eighth Grade Mathematics Classes

| | Expenses for the year 1936 | Proposed Budget for the year 1937 |
|---|---|---|
| **GENERAL FUND** | | |
| **Administrative Department:** | | |
| Salaries . . . . . . . . . . . . . . . | $13,000.00 | ---------- |
| Office Supplies . . . . . . . . . . . | 500.00 | ---------- |
| Office Expense . . . . . . . . . . . . | 1,000.00 | ---------- |
| Legal Printing . . . . . . . . . . . . | 250.00 | ---------- |
| Election Expense . . . . . . . . . . . | 1,750.00 | ---------- |
| Building Maintenance . . . . . . . . . | 1,500.00 | ---------- |
| Miscellaneous . . . . . . . . . . . . | 2,100.00 | ---------- |
| **Police Department:** | | |
| Salaries . . . . . . . . . . . . . . . | 13,250.00 | ---------- |
| Office Supplies . . . . . . . . . . . | 500.00 | ---------- |
| Telegraph . . . . . . . . . . . . . . | 250.00 | ---------- |
| Equipment . . . . . . . . . . . . . . | 1,000.00 | ---------- |
| Care of Prisoners . . . . . . . . . . | 400.00 | ---------- |
| New Equipment . . . . . . . . . . . . | 500.00 | ---------- |
| **Other General Fund Expense:** | | |
| Audit . . . . . . . . . . . . . . . . | ---------- | ---------- |
| Judgment . . . . . . . . . . . . . . | ---------- | ---------- |
| TOTAL . . . . . . . . . . . . . . . . | $36,000.00 | ---------- |
| **STREET FUND** | | |
| Salaries and Wages . . . . . . . . . | $ 6,500.00 | ---------- |
| Equipment Repairs . . . . . . . . . | 750.00 | ---------- |
| Street Materials . . . . . . . . . . | 1,500.00 | ---------- |
| New Equipment . . . . . . . . . . . . | 500.00 | ---------- |
| Gas and oil . . . . . . . . . . . . . | 750.00 | ---------- |
| Sidewalk Construction . . . . . . . . | 250.00 | ---------- |
| Weed Cutting . . . . . . . . . . . . | 500.00 | ---------- |
| Miscellaneous . . . . . . . . . . . . | 1,250.00 | ---------- |
| Opening Streets . . . . . . . . . . . | ---------- | ---------- |
| Contributions to W. P. A. . . . . . . | ---------- | ---------- |
| TOTAL . . . . . . . . . . . . . . . . | $12,000.00 | ---------- |

PROPOSED BUDGET FOR THE YEAR 1937, CITY OF DODGE CITY
(Continued)

FIRE DEPARTMENT FUND

| | | |
|---|---|---|
| Salaries . . . . . . . . . . . . . . . . | $10,200.00 | ———————— |
| Equipment Repairs . . . . . . . . . . | 250.00 | ———————— |
| Supplies, Chemicals . . . . . . . . . | 250.00 | ———————— |
| Gas and oil . . . . . . . . . . . . . | 100.00 | ———————— |
| New Equipment . . . . . . . . . . . | 700.00 | ———————— |
| Miscellaneous . . . . . . . . . . . . | 500.00 | ———————— |
| TOTAL . . . . . . . . . . . . . . . . | $12,000.00 | ———————— |

PARK FUND

| | | |
|---|---|---|
| Salaries . . . . . . . . . . . . . . . | $ 4,000.00 | ———————— |
| Road and Sidewalk . . . . . . . . . | 500.00 | ———————— |
| Building Repairs . . . . . . . . . . | 500.00 | ———————— |
| Trees, Shrubs, etc. . . . . . . . . . | 500.00 | ———————— |
| New Improvements . . . . . . . . . | 2,000.00 | ———————— |
| New Equipment . . . . . . . . . . . | 1,000.00 | ———————— |
| Miscellaneous . . . . . . . . . . . | 500.00 | ———————— |
| TOTAL . . . . . . . . . . . . . . . . | $ 9,000.00 | ———————— |

STREET LIGHTING FUND

| | | |
|---|---|---|
| Electric Current . . . . . . . . . . . | $ 7,000.00 | ———————— |
| Extensions . . . . . . . . . . . . . | ———————— | ———————— |
| Miscellaneous . . . . . . . . . . . | 500.00 | ———————— |
| Expenses . . . . . . . . . . . . . . | 500.00 | ———————— |
| TOTAL . . . . . . . . . . . . . . . . | $ 8,000.00 | ———————— |

SEWER MAINTENANCE FUND

| | | |
|---|---|---|
| Salaries . . . . . . . . . . . . . . . | $ 1,500.00 | ———————— |
| Electricity . . . . . . . . . . . . . | 1,500.00 | ———————— |
| Materials and Supplies . . . . . . . | 1,500.00 | ———————— |
| TOTAL . . . . . . . . . . . . . . . . | $ 4,500.00 | ———————— |

BOND AND INTEREST FUND

| | | |
|---|---|---|
| Bond Principal . . . . . . . . . . . | $19,676.00 | ———————— |
| Interest . . . . . . . . . . . . . . | 54,163.05 | ———————— |
| Commission and Postage . . . . . . . | 101.41 | ———————— |
| TOTAL . . . . . . . . . . . . . . . . | $73,940.46 | ———————— |

## PROPOSED BUDGET FOR THE YEAR 1937, CITY OF DODGE CITY
### (Continued)

**BAND FUND**

On Contract . . . . . . . . . . . . . . . . . $ 3,600.00     $ 3,600.00

TOTAL . . . . . . . . . . . . . . . . . . . . $ 3,600.00     $ 3,600.00

**LIBRARY FUND**

Salaries and Wages . . . . . . . . . . . . . . $ 2,750.00     —————————
Books and Periodicals . . . . . . . . . . . .     2,000.00     —————————
Light, Phone, and Fuel . . . . . . . . . . .     1,000.00     —————————
Incidentals . . . . . . . . . . . . . . . . .       750.00     —————————
Insurance . . . . . . . . . . . . . . . . . .       500.00     —————————
Improvements . . . . . . . . . . . . . . . .     1,500.00     —————————

TOTAL . . . . . . . . . . . . . . . . . . . . $ 8,500.00     —————————

**WATER FUND**

Salaries . . . . . . . . . . . . . . . . . . $15,000.00     —————————
Expenses . . . . . . . . . . . . . . . . . .  35,000.00     —————————
Improvements . . . . . . . . . . . . . . . .  10,000.00     —————————
Interest . . . . . . . . . . . . . . . . . .  15,000.00     —————————
Miscellaneous . . . . . . . . . . . . . . . .  —————————     —————————

TOTAL . . . . . . . . . . . . . . . . . . . . $70,000.00     —————————

From here the most desirable procedure is to have the pupils
gather all the data (from the city clerk and others) they possibly can to
use as a basis for an estimation of expenses for the ensuing year. The
teacher should collect the data and organize it on the basis of making
out a series of problem sheets that the pupils will use as a guide in work-
ing out the proposed expenses. For illustration consider the following
problem sheet worked out for one division of the budget, the park fund:

### PARK FUND

Problem 1. To find the total yearly amount to be allowed for sal-

aries.

Item A. Allow the caretaker $1,400 for a yearly salary.

Item B. Allow for extra workers a total of 750 hours each

month, at an average of 40 cents per hour.

Problem 2. For road and sidewalk materials allow $500.

Problem 3. To find the total amount to be allowed for building

repairs.

Item A. Find how much to allow for building a brick parti-

tion in one of the buildings. The partition is to

be 50 feet long, 10 feet high, and 1 foot thick.

Twenty-two bricks will lay a cubic foot. The cost

of bricks is $8.50 per M.

Item B. For other building repairs allow $406.50.

Problem 4. To find the amount to be allowed for trees, shrubs,

seeds, etc.

Item A. Allow for 25 trees at a cost of $1.00 per tree.

Item B. Allow for 50 shrubs at a cost of 75 cents per shrub.

Item C. Allow $437.50 for seeds, plants, etc.

Problem 5. To find the total amount to be allowed for new improve-

ments.

Item A. A new wire fence is planned to enclose a rectangular

space, 48 feet by 36 feet. Five strands of wire will

be needed. Find the cost of wire at 1½ cents a foot.

Item B. Steel posts, placed four feet apart, will be needed for

the fence in Item A. Find total cost at $1 per post.

Item C. Find the cost of fencing in one of the circular

gardens having a diameter of 28 feet. The cost

per foot of the fence is 35 cents.

Item D. For changing the course of one of the roads allow

$950.

Item E. For other improvements allow $968.60.

Problem 6. To find the total amount to be allowed for new equip-

ment.

Item A. Allow $275 for a new mowing machine.

Item B. They are planning to tear down and sell the materials

from one of the small frame buildings for $75. A new

building will cost $500. Find out how much to allow

for the new building, counting on the sale of the

materials from the old building as helping out on the

cost of the new building.

Item C. For other new equipment allow $500.

Problem 7. For miscellaneous allow $500.

Problem 8. Find the total of the park fund.

Problem 7, above, illustrates items found throughout the budget for

which the teacher will have to specify the amount to be allowed. If the

work on the city budget precedes the actual proposed budget made out by the

city clerk then the teacher will have to specify any amount for such items

as she thinks will be reasonable. If the work on the city budget is taken

after the actual proposed budget has been established, then the amount al-

lowed for all the items of the pupil's budget should correspond to the a-

mounts allowed in the actual budget. This means that the problem

sheets will have to have been carefully organized by the teacher.

After the amounts allowed for each item in the entire budget

have been recorded, further problems suggested for the work on the budget

are:

1. Find the total amount to be allowed for the management and main-

   tenance of the city government.

2. What is the per cent increase over last year's expenditures?

3. What per cent of the total expenditures allowed this year is to

   be spent for fire protection? Street lighting?

4. Secure the budgets of various cities corresponding in size to

   your city and compare the amount of expenditures for some of the

   items.

The second purpose of this unit is to consider how money is raised

to maintain the city government. The teaching procedure and pupil ac-

tivity should be identical to that outlined in a study of the school budg-

et, unit two of this chapter. The central problem will be to find the

city treasurer's balance for the preceding year. As in the school budget

this allows for a study of the methods of taxation and the amounts received

through each method.

## Unit V

A. Intermediate Objective:  To understand the social as well as the finan-

   cial costs of bad or inadequate housing in the community

1. Specific Objective

    a. To introduce the concepts of per cent, total, rating scale,

       survey, table, and estimate

    b. To gain information relating to the elements of a rating

       scale for a survey of housing conditions

    c. To develop skill in performing those arithmetic abilities per-

       taining to the fundamental operations, per cent, tables, graphs,

       and a rating scale for a housing survey

B. Suggestions for pupil activity and teaching procedure:  If education

   is to help man live more abundantly, no one can overlook the housing

   problems presented in a study of community housing facilities.  This

   is important from a health standpoint as well as from a better citizen-

   ship viewpoint.  Since trailers are becoming popular, it might be well

   to include, also, a study of the social effects upon the community of

   the migration by trailer.

     The financial costs of inadequate housing to the community, directly,
will be in terms of increased taxation.  Perhaps an extra fire department
station need be maintained.  Maybe the health department is forced to spend
more money for health service in the crowded, unhealthy districts, or per-
haps the city must create new centers of recreation for those unlucky chil-
dren that cannot find room to play in their own back yard.  The most desir-
able solution for crowded conditions is to tear down part of the buildings
(referring especially to the slum district) and spread out the city.  That
leaves, still, the individual houses to be considered.  It will be the pur-

pose of this unit to show what part mathematics should play in the improvement of housing facilities.

1. The pupils should make out a rating scale for housing conditions. The items used in a survey of rural homes in Iowa, Florida, Kentucky, Maryland, Nevada, New Mexico, and Arkansas should suggest a rating scale.[6] These items are:

1. piped in water

2. kitchen sink with drain

3. electric lights

4. kerosine or gasoline stove

5. gas or electric stove

6. bathrooms

7. dining rooms

8. unpainted frame houses

9. condition of house

    a. foundation

    b. roof

    c. doors and windows

    d. paint--exterior

    e. interior, walls and ceiling

Another item that should be added to the list above is garbage disposal. The pupils should use their rating scale in a survey of their own

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[6] Status of Farm Housing Iowa, Agricultural Experiment Station, Iowa State College of Agriculture and Mechanic Arts, Research Bulletin No. 174, September, 1934, Ames, Iowa, cited by the Study Bulletin for the Program for the Improvement of Instruction, Department of Education, State of Kansas. Topeka, 1936, p. 30.

homes and other homes if possible.

The central problem should be stated as follows:

1. What per cent of the total number of houses surveyed have piped-in water? Kitchen sink with drain? Etc.

The pupils should put their answers in the form of a table so they can readily determine the outstanding inadequacies of the homes in their community. The remaining pupil activity and teaching procedure should be based upon problems in estimating costs of improving the housing conditions.

The statistics on inadequate housing should be used to help emphasize the social costs of inadequate housing.*

### Unit VI

A. Intermediate Objective: To understand the employer-employee-business-consumer relationships in the various types of business in the community with the view of making business more effective in its human relation-ships

1. Specific Objectives

   a. To introduce the concepts of profit, corporation, stocks, divi-dends, capital, gain, loss, receipt, insurance, interest, bill, and financial statement

   b. To gain information relating to the elements of a business budget

   c. To develop skill in performing those arithmetic abilities per-taining to the fundamental operations, per cent, budget, and vari-

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* Excellent material on current developments in housing can be se-cured from numerous federal surveys. The teacher should consult Current Developments in Housing, The Annals of the American Academy of Political and Social Science, Volume 190, March, 1937.

ous business forms and devices.

B. Suggestions for pupil activity and teaching procedure: Quite a
variety of problems are offered in a study of employer-employee and
business-consumer relationships. The best foundation for this unit
should be established by a study of the financing of a small business
undertaking.

The pupil should assume that he is going to establish a small
business. Before any money is invested, a budget should be made out.
The individual items of the budget should be adapted to the needs of the
business. Jeanne Batten suggests that a budget for a retail business be
worked out on a basis of the amount of monthly sales expected.[7] For
example, the budget on a monthly sales quota of $1000 should break down
about as follows:

Merchandising costs (including shipping charges,

   etc.) should take approximately 2/3 of the

    total . . . . . . . . . . . . . . . . . . . . . . . $ 667.00

 Gross profit or overhead and profit . . . . . . . . . <u>330.00</u>

               $1000.00

Miss Batten includes the following items under the gross profit
or overhead and profit division of the budget:

   Rental . . . . . . . . . . . . . . . $100.00
   Lighting . . . . . . . . . . . . . 10.00
   Telephone . . . . . . . . . . . .  6.00
   Supplies, etc. . . . . . . . . .  5.00
   Cleaning of shop, windows,
   Heating . . . . . . . . . . . . 10.00

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  [7] Jeanne Batten, "Financing the Small Shop," <u>Independent Woman</u>,
XV:319, October, 1936.

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           Bank service . . . . . . . $ 5.00
           Taxes, possible license
           fees, etc . . . . . . . . . 25.00
           Insurance . . . . . . . . . 10.00
           Advertising circulars,
           Postage, stationery, etc . 15.00
           Salary . . . . . . . . . . . 147.00
                                       $333.00
```

The pupils can use the plan outlined above for their budget. The expense items will probably vary, however, in various localities.

Adequate records are necessary to control the budget. These records are to keep tract of merchandise received and sales. Other financial records must be maintained also. For credit stores a Charge Account Ledger is needed. All stores, of course, will maintain the Monthly Financial Statement. If time allows, a study of these record forms should be made.

Some businesses are organized differently. Besides the individually owned business, there are partnerships, corporations, and cooperative stores. Budget expense items such as wages, building maintenance, and all other overhead expenses are similar to the expense items in the budget of the individually owned store. However, there are differences in the organization of the different businesses under the law and differences in the general business set-up in regard to the amount of capital invested and the distribution of profits.

The pupils should choose businesses typifying the different forms of ownership and compare the amount of capital invested. A study of these same businesses should reveal how the profits are distributed, or if the profits are not distributed, how they are used to enlarge the business.

Other problems that relate to this unit, whole or in part, are:

1. Price wars

2. Installment buying

3. Price fixing (by the government or a retail organization)

4. Cash and credit

5. Loan organizations

6. Business and public utilities

The teacher can use her own plan of presentation for the related problems above. Throughout the study of the entire unit, the pupil should keep in mind the fact that the individual possessions accumulated by business men supply the bulk of the taxes for running the community.

## MATHEMATICS OF THE COMMUNITY IN TERMS OF

### THE CURRICULUM OBJECTIVE, HEALTH EFFICIENCY

The curriculum objective, health efficiency, represents a central emphasis on health activities in terms of socially significant meanings involving initiative, sharing, cooperation, and desirable social consequences. The pupil should understand the uses of food, shelter, and clothing to satisfy the health needs of the body. Education should help not only the individual but should also make its business the helping to take up the lag between existing community health standards and standards that are better and just as capable of realization.

This chapter outlines two units on health, one unit emphasizing pupil knowledge of food needs and the second unit emphasizing one way of helping raise the community health standard by providing for more adequate life protection from accidents.

### Unit I

A. Intermediate Objective: To understand the use of food in the best
   possible dietaries of individual pupils
   1. Specific Objectives
      a. To introduce the concepts of budget, account, approximation,
         total, average, vitamin, per cent, income, minimum, and maximum
      b. To gain information relating to the items of a balanced diet

c. To develop skill in performing those arithmetical abilities pertaining to the fundamental operations, per cent, and the making and interpretation of tables, graphs, and budgets.

B. Suggestions for pupil activity and teaching procedure: As a whole America is perhaps the best-fed nation in the world. But a study of individual diets would probably show these diets to be deficient in many respects.

An analysis of the nutritive value of the diets of families of wage earners and clerical workers in North Atlantic Cities, 1934-1935, made by Dr. Hazel Stiebeling of the United States Bureau of Home Economics, shows that those families who had more money to spend on food were less likely to have deficiencies in their diets.[1] Why is this true? The pupils should discover with very little investigation that the most frequent lacks in diets are found to be vitamins and minerals. The foods containing these elements, furthermore, are the more expensive foods. The higher income levels, in general, then, can enjoy better diets.

In the interests of society, however, is it possible to use economy in the selection of a better diet? Dr. Hazel Stiebeling states that by applying present-day knowledge of foods and nutrition to problems of food selection, low-income groups, also, could secure better diets and undoubtedly raise the level of their health without necessarily increasing their

[1] Hazel K. Stiebeling, "Nutritive Value of Diets of Families of Wage Earners and Clerical Workers in North Atlantic Cities," Monthly Labor Review, 43:20, July, 1936.

food expense.[2] Since the selection of a balanced diet on a small budget is a problem faced by so many families, it should be worth-while for the pupil to acquire some knowledge of the health needs of the individual and how these needs can best be satisfied. An eleventh grade health class of the Camden High School, New Jersey, undertook such a project when they studied the food needs of an imaginary family and the minimum cost for supplying these needs.[3] The imaginary family consisted of an anemic father, a nursing mother with a seven-months old baby, a boy of five, a boy of eleven, and a high school girl of fourteen, who was particularly susceptible to colds. The class members decided upon the food requirements of this family and then made out a menu for one week that supplied all the foodstuffs within a total weekly cost of $8.50.

Somewhat the same procedure should be followed in a study of individual health needs and how these needs can best be satisfied. Through the aid of home economics, the pupils should first classify foods according to their nutritive values. Then menus or food lists should be made out to determine what foodstuffs and how much is to be purchased at the local stores. The minimum cost of the selected diet for any given period of time can then be ascertained for the individual. This cost should be related to the family food budget.

It will be most desirable to have the pupils work out further diets for the rest of their family and relate the total amount to be spent for

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[2] Ibid., p. 21.

[3] Marjorie Van Horn, "Tackling a real health problem," Hygeia, 15:173, February, 1937.

food to the family income. Consider, for example, a study made by
Virginia Britton in which she determined the lowest cost at which a
family could have an adequate diet and also ascertained if wages set by
the W. P. A. and N. I. R. A. in Akron, Ohio, would provide an adequate
diet plus a minimum for other necessities.[4] She secured prices on
January 21, 1936, for the minimum cost of a selected diet for one week
for a family of five. She found the W. P. A. and N. I. R. A. income,
which could not provide an adequate diet plus a minimum for other ex-
penses for a family of five, appeared to be sufficient for an adequate
diet and minimum living expenses for a family of two.

This unit reveals how the work in home economics should cooperate
with the work in mathematics in determining food needs. In a similar
manner, the other divisions of the home budget should be worked out ac-
cording to the needs for clothing, furnishings, shelter, etc., as revealed
by the work in home economics and industrial arts.

## Unit II

A. Intermediate Objective:  To acquire a full knowledge of accidents in
the orders of frequency and severity and the best methods of preven-
tion, and then the development and fixing of habits which will prevent
accidents taking place

1. Specific Objectives

a. To introduce the concepts of per cent, graph, table, ratio,

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[4] Virginia Britton, "The Cost of Food and the Adequacy of Income,"
Journal of Home Economics, 29:294, May, 1937.

error, accident frequency, survey, and statistics

    b. To gain information relating to the elements of a survey

       for accident frequency

    c. To develop skill in performing those arithmetic abilities

       pertaining to the fundamental operations, per cent, and the

       making and interpretation of tables and graphs

B. Suggestions for pupil activity and teaching procedure: Is the class-

    room a safe place for play and work? Is the home a safe place for

    play and work? How safe is the city park? These and other questions

    can easily be answered by the pupils in a survey of accidents that oc-

    cur at school, home, and elsewhere in the community.

       For a survey at school have the pupils make out a list of places

where accidents might occur inside the school building. This list should

be similar to the following:

    1. Classrooms

    2. Halls and stairs

    3. Gymnasium

    4. Vocational shops

    5. Miscellaneous

       The data gathered in the survey should include the number of acci-

dents occuring at a listed place and the nature of the accident. It might

be desirable, depending on the particular class, to record other items of

information concerning the accident, such as the age and sex of the victim

and the date of the accident.

       Using the data he has gathered, the pupil should organize at least

two tables, one table containing the number of accidents occurring
at each of the listed places and the other table listing the number of
accidents according to the cause or nature of the accident. With these
tables before him the pupil should readily determine answers to the fol-
lowing questions:

1. What per cent of the total accidents occurred in the class-
   room? Halls? Etc.

2. What per cent of the total accidents were due to fire? Falls?
   Etc.

3. Make a graph of the per cents found in the two problems above.

The problems above refer to children of school age. In a survey
of home and community accidents, however, it will be more convenient to
make a distinction between those of school age and adults. Separate
tables should be made that can be combined if necessary.

The results of the survey can be used for comparison with other
school studies. Florence Nelson, editor of the Safety Education Magazine,
New York City, cites the latest National Safety Council studies as showing
that nineteen per cent occur on the school grounds.[5] The accidents in
school buildings were classified as follows:

| | |
|---|---|
| Gymnasium . . . . . . . | 35 per cent |
| Corridors and stairs . | 20 per cent |
| Vocational shops . . . | 14 per cent |
| Classrooms . . . . . . . | 13 per cent |
| Others . . . . . . . . | 18 per cent |

The statistics on school accidents that the pupils have gathered

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[5] Accident Facts. National Safety Council, Chicago, 1935, cited by
Florence Nelson, "Is Your Classroom a Safe Place for Play and Work?"
Hygeia, 14:1034, November, 1936.

should make it clear to them just where the need will be for concentrating on the safety problems of certain areas.

Is the home a safe place in which to play and work?  Last year (1936) the total of fatal accidents amounted to 110,000 as reported at the convention of the Greater New York Safety Council.[6]  For the first time the home emerged ahead of the automobile in the number of fatal accidents.  Delegates at the convention learned that 39,000 people were killed accidentally at home, an increase of 7,500 over the year 1935 record. What is the nature of home accidents and where do they occur in the home?

The class should agree upon a list of places where accidents might occur in the home.  This list should include the garage, yard, hallways, living-room, kitchen, bath-room and bed-room.  The pupil should take this list home and enlist the aid of his parents in determining the number of accidents occuring over a certain period of time (the period of time having already been agreed upon by the class) in his home, the type of accident, where it occurred, whether or not it was fatal, and, if possible, the age and sex of the injured.  It would be highly desirable if a survey of the community could be made in addition to the pupils' homes.

The pupils' individual reports should be combined and organized into tabular form.  Using the table the pupils should answer typical questions as follows:

1. What types of home accidents predominate?  Where is the most

   dangerous place in the home?

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[6] Science and Medicine, "No Place Like Home for Accidents," Literary Digest, 123:16, April 24, 1937.

2. The National Safety Council reports that two types of home
   accidents predominated last year (1936), burns and falls.
   How does this compare with your study?

3. The National Safety Council reported the kitchen as the most
   dangerous place in the house; there, 56 per cent. The bedroom was
   next, accounting for 36 per cent. Compare these per cents with
   your findings.

4. Age groups determine the nature of home accidents. Falls kill
   74 per cent of victims over sixty-five, only 7 per cent of young-
   sters under four. Burns, however, kill 35 per cent of these
   youngsters, and only 7 per cent of those in the homes over sixty-
   five years of age. Compare these percentages with the findings
   from your table.

5. Accidents last year cost an estimated sum of $730,000,000. What
   is the cost per person?

6. Disability effects show that 170,000 were permanently disabled.
   This was one person out of how many for that year (1935)?

7. Secure the statistics regarding the deaths due to different
   diseases in your community and compare these data with the number
   of fatal accidents occurring in the homes.

For the last step in a study of home accidents, it should be possi-
ble for each pupil to locate hazards in his home and estimate the cost of
eliminating such hazards.

How safe are the public playgrounds? The streets? Accident Facts
of the National Safety Council show that of the 100,000 fatalities in 1935,

the number charged to accidents involving motor vehicles is 37,000 and 18,000 to public accidents (not including motor vehicle accidents).[7]

Pupil activity should closely resemble that outlined above for a study of home accidents. The pupil's list of places where accidents might occur should include not only the streets but other public places as the parks, swimming pools, playgrounds, and all recreational centers. The class should organize a general table listing the number, type, and place of the accidents occurring in the community over a certain period of time. Through calculations based on percentage the pupil can determine what types of accidents predominate and where the most dangerous place is in the city.

To complete the study it is desirable to check on the number of vocational and industrial accidents occurring in the community, following the procedure of the work on school, home, and city accidents. Then it will be possible to answer a variety of questions involving a comparison of the number of accidents occurring in school, at home, and down town. For example, consider the following questions:

1. What per cent of the accidents of the community occur at school? At home? Etc.

2. In New York City 25 per cent of the accidents to school children occur in school buildings while for the nation the figure is 36 per cent.[8] Compare your figures with these.

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[7] Accidents, Industrial. "Accident Statistics of National Safety Council for 1935," Monthly Labor Review, 43:364, August, 1936.

[8] Frank S. Lloyd, "Some Hazards of Recreation," Recreation, XXX: 400, November, 1936.

3. In New York City 25 per cent of the accidents occurred at
home while the figure for the nation is 44 per cent.[9]  Compare
your figures with these.

# CHAPTER IV

## MATHEMATICS OF THE COMMUNITY IN TERMS OF
## THE CURRICULUM OBJECTIVE, LANGUAGE EFFICIENCY

The curriculum objective, language efficiency, represents a central emphasis on language activities in terms of reading, listening, writing, and speaking--getting socially significant ideas, and expressing them in areas of important social relations. Whether the pupil is at home, at school, or participating in a community meeting he must acquire the ability to effectively express his ideas on the level of an intelligently informed future citizen. Some things he will need to learn to read intelligently for his own use, as maps, circulars, time table, etc. As far as mathematics is concerned, it should be the plan of every pupil to develop the ability to interpret the common quantitative relations met within the ordinary run of everyday life and express his interpretations accurately in speech or writing.

## Unit I

A. Intermediate Objective:  To develop the ability to calculate the common quantitative relations and problem met within the ordinary run of everyday affairs and to express the processes and results in accurate speech or writing

1. Specific Objectives

   a. To introduce the concepts of graph, table, rate-of-change,

functionality, normal curve, statistics, dependence, and probability.

b. To gain information relating to the elements of statistics

c. To develop skill in performing those arithmetic abilities pertaining to the fundamental operations, per cent, statistics, and the interpretation of graphs and tables

B. Suggestions for pupil activity and teaching procedure: In a democracy such as ours, desirable social reconstruction can come about only if people in general can learn to do better economic thinking. The social-economic processes have many quantitative aspects that involve statistical and mathematical methods. It will be the purpose of this unit to show how mathematical instruction can be arranged so that boys and girls will be able to think and speak about social-economic problems in quantitative terms.

The pupils should be interested, first, in bringing to class any article they have read that expresses itself in terms of a quantitative relationship. Perhaps the article enlists a graph to help express some relationship. If this relationship happens to be the changes in price of a commodity, then the teacher will have a start for centering class work on an important quantitative concept, the idea of the rate of change. Once the pupils get the notion of the rate of change, they should be willing to find other material illustrating this concept. Other economic activities that suggest the rate-of-change concept are: changes in salaries and wages; various trends, as the trend of living costs; changing tax rates; variations in real estate values, etc. The bulk of the mathematics will center on the

interpretation of graphs and other data in terms of the rate-of-change concept of quantitative thinking.

Perhaps a pupil will bring a graph to class showing the distribution of wealth. Another pupil may present a table showing the heights and weights of a selected group of people. Or perhaps some one will want to know how many morons there would be in a sampling of one thousand individuals. In respect to these economic matters, the teacher should base the class work on a study of frequency distributions.

The pupil should learn the statistics involved so that he will become acquainted with such terms as the normal curve, mode, median, average, and sampling. As a result of this work, the pupil should discover that vague quantitative thinking can be avoided by applying statistical methods to various social problems.

Another quantitative concept is based on the element of chance-- the concept of probability. What are the chances a man of twenty will live to be forty years old? How likely is a person to be killed by an automobile if he crosses in the middle of a block? The pupils should learn that these questions can be intelligently answered, but only on the basis of the probability concept. In this connection they learn how to read and interpret tables and graphs that attempt to forecast events. They should understand how probability data can be used intelligently in a safety campaign, a study of the growth of population, and trends in birth and death rates, etc.

Still another quantitative concept is based on the idea of functionality, that is, the dependence of one quantity on another. The price

of a commodity depends on the supply and demand curve of that commodity;
the amount of taxes paid depends on the assessed valuation of the prop-
erty, etc. The teacher should first explain to the pupils how the amount
of interest depends on the principal. After the pupils get the idea of
dependence, then they can study other economic data involving the idea
of the quantitative concept of functionality.

Many other related concepts should readily suggest themselves.
It is not so important that the pupil understand all the mathematical
principles involved; some of them are too technical for even senior high
school pupils to understand. The pupil should learn, however, that there
is such a thing as mathematical training for economic thinking and expres-
sion.

## MATHEMATICS OF THE COMMUNITY IN TERMS OF
### THE CURRICULUM OBJECTIVE, HOME-LIFE EFFICIENCY

The curriculum objective, home-life efficiency, represents a central emphasis on home-life activities, knowledge, and attitudes involved in making the home a better place in which to live. The intermediate objectives should aim first at an understanding of the parent-child relations in the family group. Then the educational relations, cultural developments, and various economic factors within the home can be considered. The following unit is based on the planning of the family vacation. It is representative of the part that mathematics should play in fulfilling the objective, home-life efficiency.

### Unit I

A. Intermediate Objective: To develop a knowledge of how to plan the family vacation

   1. Specific Objectives

      a. To introduce the concept of budget, total, account, fund, and approximation

      b. To gain information relation to the elements of a vacation budget for the family

      c. To develop skill in performing those arithmetic abilities pertaining to the fundamental operations, per cent, and budgets

B. Suggestions for pupil activity and teaching procedure: No one
should consider going on a vacation without an estimate of the
probable cost. This, of course, also applies to the family group.
Perhaps the group has plenty of money to spend and doesn't feel
they should make any budget. In the majority of cases, however,
the family must plan their vacation in terms of what they feel they
can afford to spend.

There are two approaches to the planning of a vacation. The pu-
pils can decide on a special place for the vacation and how much time
is to be spent there. Then it should be possible to make a budget for
the entire vacation. The second approach is planning a trip to suit
the pocketbook. Since most families have to consider the amount of
money they have to spend it will be the purpose of the unit to combine
the two approaches. That is, the pupils should first decide upon a
place where they would like to spend a vacation. Then a study of the
costs involved should determine whether they can afford the trip or not,
and if they can, just how long they can stay in terms of how much money
they have to spend.

After a place has been chosen the pupils should decide upon what
materials should be taken along. If the pupils' parents own a car,
those pupils should be interested in the cost of thermos jugs, camp equip-
ment, etc.

The expense of transportation should be considered secondly. If
the family owns a car, then the pupil should look up the mileage and de-
termine the cost of gas and oil for the entire round trip. The pupil

must remember that prices vary in different states. An allowance
should be made for miscellaneous car expenses, depending largely on the
condition of the family car. That family that takes the train will have
to figure the entire transportation cost in terms of railroad fares.

Other expense items included on the trip to the point of destina-
tion are food and shelter. If the family owns a trailer the shelter item
is automatically taken care of. Most of the pupils will decide upon
cabins as the probable means of shelter.

After the point of destination has been reached the expense items
will probably vary to some extent. Perhaps father wants to fish and
decides he needs some equipment more adaptable to that section of the
country. At any rate the family must eat and sleep so the expenses for
these two items should be estimated first. Sometimes these expenses vary
enough in different localities to make a large difference in the budget.
Any information that the pupils can gather in respect to these items should
be carefully considered in respect to the budget.

There should be a fund to take care of various recreational and
leisure-time activities. If the resort offers any side trips that the
pupils know of, such items should be provided for in the recreational funds.
A week's vacation at the point of destination should be long enough to plan
for as the average family only has from a week to two weeks for their va-
cation.

The work outlined above has suggested the division of expenses into
initial materials, transportation, other expenses enroute, and the expenses
at the point of destination including two funds, one for food and shelter

and the other for recreation. It might be more desirable to set up
the expenses under definite funds for the entire vacation as the food
fund, the transportation fund, the shelter fund, the recreation fund,
and a fund for miscellaneous items. Either method should give the pu-
pil an idea of the expenses of a vacation that he can relate to the
family income.

# CHAPTER VI

## MATHEMATICS OF THE COMMUNITY IN TERMS OF
## THE CURRICULUM OBJECTIVE, LEISURE-TIME EFFICIENCY

The curriculum objective, leisure-time efficiency, represents a central emphasis on leisure-time activities, in terms of enjoyable mental and physical recreations, which tend to improve health and social relations in general, as well as personal attitudes and appreciations.

The pupil should realize from the very first that wholesome recreation leads to both physical and mental health. Then it will be a responsibility, not only of the schools, but also of the city, state, and nation to provide adequate recreational facilities for both its citizens and future citizens.

It seems regrettable that commercialized amusements have become the chief forms of recreation for the masses. Actual participation in sports and other activities is more desirable for a realization of better physical and mental health.

The mathematics of the community in terms of the curriculum objective, leisure-time efficiency, should include a study of the following:

1. The cost of equipment for various sports as golf, tennis, soft ball, fishing, hunting, and swimming

2. The number of public recreation centers as parks and playgrounds and the cost of maintenance

3. The contributions of various organizations and service

    clubs towards meeting the need for wise use of leisure time

4. The number of people having radios in relation to the total

    number of people in the community

5. The budgeting of the pupil's day so as to assure him an op-

    portunity for the wise use of leisure time

6. To estimate the cost of travel with its many interests as far

    as one's economic status will allow

7. To enjoy participation in various mental games as chess, bridge,

    and different types of puzzles

    The remainder of this chapter will be devoted to the development

of a unit on the use of mathematics puzzles, illustrating one way in

which mathematics should function in terms of the curriculum objective,

leisure-time efficiency.

## Unit I

A. Intermediate Objective: To enjoy participation in various mental

    games as chess, bridge, and different types of puzzles

    1. Specific Objectives

        a. To introduce the concept of mathematical puzzles

        b. To gain information relative to the organization of a mathe-

            matics club

        c. To gain skill in performing those arithmetical abilities in-

            volved in the solving of mathematical puzzles

B. Suggestions for pupil activity and teaching procedure: The question

propounded here might well be, "What are the recreational aspects
of mathematics?" Undoubtedly a relation of mathematics to the
recreational interests of the child will promote a more vital in-
terest in mathematics and develop a worthy use of leisure time.
Anna R. Meeker suggests that these activities divide themselves into
two groups for the junior high school, club and extra-curricular
activities, and classroom activities.[1]

An organization of a club should be especially desirable if the
school fails to provide for such types of activities as dramatics,
group singing, field trips, and training in formal parliamentary law.

The library should include a number of books dealing entirely
with mathematical recreations. W. W. Ball,[2] A. F. Collins,[3] H. E. Licks,[4]
and others have written books from which the pupil should gain a great
deal of pleasure.

Besides a number of books, a file of puzzles clipped from the news-
papers should be kept in the classroom. There are games, also, which
should be used to motivate drill work. Most of the pupils are interested
in basketball, baseball, and other sports. The terminology of these games
can easily be used to cover up almost any amount of drill work. Since the

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[1] Anna R. Meeks, "Recreational Aspects of Mathematics in the Junior
High School," The Mathematics Teacher, 29:21, January, 1936.

[2] W. W. Ball, Mathematical Recreations and Essays. New York:
Macmillan and Company, 1905.

[3] A. F. Collins, Fun with Figures. New York: D. Appleton and Com-
pany, 1928.

[4] H. E. Licks, Recreations in Mathematics. New York: D. Van Nostran[d]
Company, 1917.

pupils are generally interested in playing games and working puzzles, such activities should easily become an enjoyable way in which they can spend part of their leisure time.

CHAPTER VII

MATHEMATICS OF THE COMMUNITY IN TERMS OF

THE CURRICULUM OBJECTIVE, VOCATIONAL EFFICIENCY

The curriculum objective, vocational efficiency, represents a central emphasis on guidance in the choice of a vocation, experience in the vocation when chosen, the social, civic, and health relations of the vocations, and especially of the one which one expects to enter. Vocational training, regardless of what its main objective may be, spreads itself into the very fabric of the social order. The term vocational training implies a training for an occupation or profession. In its larger sense the term should refer to a training for the profession of living. Then it shall have assumed its proper place in improving the social order.

The mathematics of the community in terms of the curriculum objective, vocational efficiency, should include a study of the following:

1. The cost of preparation of the various vocations in the community

2. The actual mathematics of the vocation itself

3. The plane of living demanded by the various vocations and the costs of adhering to that plane of living

4. A study of the advance in earning offered by the various vocations

5. Information regarding the opportunity or probability offered in

the entering of the various vocations and professions

in the community.

The following unit is based on a study of the opportunities

offered in the various vocations and professions in the community.  It

is representative of the part that mathematics should play under the

curriculum objective, vocational efficiency.

## Unit I

A. Intermediate Objective:  To become informed regarding the opportuni-

ties offered in the various vocations and professions in the communi-

ty, the preparation and personal requirements of these vocations and

professions, and the pupil's capacity for success in each

　1. Specific Objectives

　　a. To introduce the concepts of survey, per cent, total, graph,

　　　table, and vocation

　　b. To gain information relating to the elements of a vocational

　　　survey

　　c. To develop skill in performing those arithmetic abilities per-

　　　taining to the fundamental operations, per cent, surveys, and

　　　the making and interpretation of graphs and tables

B. Suggestions for pupil activity and teaching procedure:  Information re-

garding the opportunities offered in the various vocations and profes-

sions in the community can best be obtained by an occupational survey

of the community.  Each student should be provided with a mimeographed

sheet indicating the information to be acquired. These sheets
should be taken to the business houses and factories in the
community. The information gathered should include:

1. The different types of vocations in the community

2. The number of males and females employed part-time and
   full-time in the different vocations

3. Data showing the number employed (referring to businesses
   and factories) in past years and the probable number of
   new appointments for the coming year

4. If possible, data showing the cost of entering the different
   vocations obtained from the individual.

The occupational data gathered should be arranged in tabular form.
The pupils are now not only provided with occupational data concerning
their own community, but are also provided with a knowledge of the most
probable fields of employment whether temporary or permanent.

To better illustrate the use of the data acquired, consider, for
example, the results of a student survey of local occupations of the city
of Logansport, Indiana, which had a population of 18,508 according to the
latest federal census.[1] The occupational information obtained concerned
318 general businesses, fourteen factories, 100 places of business estab-
lished by professional men and women, and seven taxing units of government.
There were 152 different types of vocations in the community. These types
were placed under classifications of agriculture, manufacturing, mechanical

    [1] J. Fred Murphy, "A Student Survey of Local Occupations," The
Social Studies, 27:474, November, 1936.

industries and trades, transportation and communication, trade, public
service, professional service, domestic and personal service, and
clerical occupations. The survey revealed that Logansport had gradu-
ally gone through a period of transition from a railway center to an
unspecialized rural and urban community dependent upon no single in-
dustry. It was discovered that for full-time employment thirteen were
in agricultural pursuits, 1179 in manufacturing, mechanical industries
and trades, 539 in road and street transportation, 812 in railroad trans-
portation, ninety-one in express, postal, radio, telegraph, and telephone
service, 776 in trade, 105 in public service not otherwise classified,
475 in professions, 569 in domestic and personal service, and 396 in
clerical occupations.

The pupil should find what per cent of the total is employed in
each of the classifications of employment as outlined above. This should
give him an idea as to the most probable fields of employment.

If the survey contains approximate costs of entering these fields
then the pupil should make a study of these costs. If these estimates
are not available in the report of the survey, the teacher and the class
should make an effort to estimate the costs of entering the major fields
of employment, the major fields being determined by the survey.

The employment figures obtained in the survey for past years and
future employment should be used to figure the percent of increase or de-
crease of employment for a particular type of vocation. This gives the
pupil another angle as to the most probable fields of employment.

A graph should be made to show the relative numbers employed in
the various vocations and professions of the community.

This study has proposed a presentation of the mathematics of the important phases of community life in a socialized curriculum for the junior high school. It has aimed to more ably fulfill, rather than deviate from, the established objectives of mathematics by showing where and how mathematics should support the various curriculum objectives. Smith and Reeve classify the abilities needed in arithmetic for the junior high school under five general heads.[1] In summary these needs are:

1. The ability to perform accurately the fundamental operations with respect to whole numbers, decimals, fractions, and to use short cuts in the performing of these operations;

2. The ability to use per cent;

3. The ability to use the common forms of denominate numbers;

4. The ability to make an interpret statistical tables and graphs;

5. The ability to understand and use various business forms and devices so as to develop the ability to keep a personal account book, the ability to make various budgets, and the ability to interpret financial statements, etc.

This study has aimed to take all of these abilities into account as the various units have been developed. Any drill on the fundamental

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[1] David Eugene Smith and William David Reeve, "Objectives in the Teaching of Junior High School Mathematics," in the Second Yearbook of the National Council of Teachers of Mathematics. Curriculum Problems in Teaching Mathematics, pp. 191-194.

operations or review on the mathematical processes should be taken when the teacher so desires. No time limit or grade level of the presentation of the units has been suggested, mainly because the size of the community will to a large extent determine the use of the various units. For further study in the field, it might be suggested that the work be carried into the other major areas of socially significant relationships, state relations, national relations, and international relations.

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