COMMONWEALTH OF VIRGINIA
STATE BOARD OF EDUCATION
Richmond 16

SUPTS. MEMO. NO. 2985

March 16, 1954

TO: The Division Superintendent

FROM: Dowell J. Howard, Superintendent of Public Instruction

SUBJECT: Mathematics Curriculum Bulletin

We are sending you, under separate cover, 3 copies of the bulletin entitled "Mathematics In Grades One Through Twelve - A Tentative Guide to Curriculum Development." This bulletin was developed in a workshop at Fishersville, Virginia, during the summer of 1951. The membership of the workshop was comprised of classroom teachers, principals, supervisors, directors of instruction, college staff members, and staff members of the State Department of Education. Following the workshop, the original manuscript was edited and prepared for publication by a committee of participants in the workshop.

We invite you and members of your staff whom you may designate to review this bulletin carefully. If the review reveals that you can use this bulletin to advantage in the improvement of Mathematics instruction, we shall be glad to send you additional copies.

We have approximately 4,600 copies of the bulletin to distribute to the counties and cities of the State. In order to give each county and city an opportunity to get additional copies, we have calculated an allotment for each county and city. The calculation is based on the enrollment in 1952-53.

A form is attached for your use in requesting additional copies of the bulletin. The form provides for three types of requests. They are (1) a request for fewer copies than your allotment, (2) a request for your allotment, and (3) a request for the number of copies desired in excess of your allotment, if and when funds will permit printing additional copies.

Please send your request for additional copies of the bulletin to R. CLAUDE GRAHAM, DIRECTOR OF INSTRUCTION.

RCG/fg

Enclosure

COMMONWEALTH OF VIRGINIA

STATE BOARD OF EDUCATION
RICHMOND, 16
June 19, 1951

Dr. R. O. Nelson, Superintendent,
Newport News Public Schools;
Mr. Hugh K. Gassell, Superintendent,
Augusta County Public Schools;
Mr. O. L. Emerick, Superintendent,
Loudoun County Public Schools.

Dear Co-workers:

The Mathematics Production Committee will continue its work this summer at Fishersville, Virginia, July 25 - August 22. We are very anxious, indeed, to have the services of a small committee of division superintendents of schools to visit the workshop two or three times during the regular session and evaluate the work. I am suggesting at this point for your consideration that the Advisory Committee spend a day or two with the Production Committee during the first week and a day or two during the third week. The Committee may or may not need your assistance during the fourth week or during the closing day.

I sincerely hope that I will have the pleasure of seeing you at the State-wide high school principals' conference scheduled to be held at the University of Virginia June 18, 19, and 20. Many details could be discussed and plans made at this conference.

Sincerely yours,

Z. T. Kyle

Z. T. Kyle, Supervisor
Guidance and Adult Education

ztk/jt

6/21/51

June 21, 1951

Mr. Z. T. Kyle
State Board of Education
Richmond, Virginia

Dear Mr. Kyle:

I can see no difficulty now in the way of my going to Fishersville during the early part of the workshop on Mathematics Production.

If you will advise me when you desire my attendance, I shall endeavor to comply.

Very sincerely yours,

O. L. Emerick
Division Superintendent

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TENTATIVE COURSE OF STUDY FOR NINTH GRADE GENERAL MATHEMATICS AS RECOMMENDED BY THE MEMBERS OF THE MATHEMATICS WORKSHOP WHICH WAS HELD AT THE UNIVERSITY OF VIRGINIA JULY 1950

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CONTENT

Unit I - Algebra

A. New ideas in mathematics

1. "Algebra as shorthand"

2. Language of Algebra

B. Positive and negative numbers - directed numbers

C. Formulas

D. Equations

REFERENCES

The River Mathematics, Hooper, Alfred; Henry Holt Co., 1945; pp. 59-74, 106-136

Makers of Mathematics, Hooper, Alfred; Random House, 1948; chapter 3, pp. 65-106

Functional Algebra; The Mathematics Teacher, 37: 314-32

Graphical Solution of Equations: The Mathematics Teacher, 40: 147-50

Problems in Teaching Secondary School Mathematics, Breslich, University of Chicago Press; 107-200.

Basic Laws of Mathematics, Fogelson, Ida D, 5520 S. Shore Drive, Chicago, 37, Ill; 50¢, Pictures

Algebraic Works to 1700, Karpinski, Pictorial Mathematics, 186th St., New York 33. 25¢

Formulas and Equations - Tools for Expressing Laws and Relationships World Book Co., 313 Park Hill Ave., Yonkers-On-Hudson, New York; 40¢ C, D

Filmstrips

Positive and Negative Numbers - Jam Handy

Films

Algebra in Everyday Life - State A, C, D

Competences are denoted by numbers following items in content.

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CONTENT

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UNIT I
SUGGESTED GROUP AND INDIVIDUAL ACTIVITIES

A. A new idea in mathematics

1. Explaining the use of letters in place of figures

2. Reviewing symbols of arithmetic

B. Positive and negative numbers

1. Using thermometers and number scales to convey concept of signal numbers

2. Using spending and saving

3. Using difference in direction of moving objects

C. Formulas

1. Using tables to express functional relationships between or among variables (Example; Distance, rate, time relationship; or any simple number relationship)
   a. Developing statement of rules from discovered relationship

2. Expressing rules as formulas

3. Graphing formulas

4. Expressing perimeters, areas, and volumes of geometric figures as formulas

5. Working problems by use of formulas
   a. Contents of a bin of wheat
   b. Contents of a tank of water
   c. Perimeter of floor or area of walls of classroom

C. Equations

1. Forming equations from simple problems

2. Solving equations by use of the four axioms

CONTENT

Unit II - Measurement

A. Standardization (1,9,10,19, 24,4)
   Common units of measure and equivalents - linear, square, cubic, weights, liquid, time

B. Development and application of commonly used geometric formulas (1,4,13,15,21) and construction of figures (15)

1. Length
   a. Rectangles, parrallelograms, squares, trapezoid
   b. Triangle
   c. Circle (mean of pi)

2. Area
   a. Rectangle, parrallelogram, square, trapezoid
   b. Triangles
   c. Circle
   d. Lateral surfaces

3. Volume
   a. Rectangular solid
   b. Cylinder
   c. Cone
   d. Prism
   e. Pyramid (optional)

REFERENCES

This Amazing Story of Measurement Lufkin Rule Co., Saginaw, Mich., 10¢ A

Hoke Precision Gage Blocks, Pratt and Whitney, Hartford, Conn. Free A

A Study of Weights and Measures, The Mathematics Teacher, April 1944 A

Combest Mensuration Charts, Banks Upshaw and Co., 707 Browder St., Dallas, Texas A

Map Reading Charts, Denoyer-Geppert Co., 5235 Ravenswood Ave., Chicago 40, Ill.; 35¢ A,4

Air World Map, Air Age Education Research, 80 E. 42nd Street, New York 17, N. Y. A,4

Construction - Using Geometry In Practical Drawing, Schorling & Clark, World Book Co., Park Hill Ave., Yonkers-On Hudson, N. Y., B,2

UNIT II
SUGGESTIONS FOR TEACHING

A. 1. Recall the history of the development of measurement

2. Give the pupils practice in estimating and measuring lengths to show that all measurements are approximations

3. Display models of foot, square foot, cubic foot, and other units of measure

4. Use maps, charts and globes to develop the meaning of line measure and time

5. Compare units of measure to show ratio of foot to yard, pint to quart, ounces to pounds, right angles to straight angles

B. 1. Have pupils measure diameter and circumference of bicycle wheels, cans, pipes and divide to find the value of pi

2. Recall basic constructions and have the pupils construct square, rectangle, parrallelogram, triangle, circle

3. Let the pupils make a display of solids to fix the idea of the third dimension; glasses, boxes, cans, etc.

4. Let the pupils list things sold by linear, square, and cubic measure and solve problems involving these measures

5. Let the pupils make figures (squares, rectangles, circles, etc.) out of wire to teach the meaning of perimeter

6. Estimate and find the volume of conical piles of gravel, coal, sand, grain, etc.

7. Develop formulas in concrete way such as -

a. To find area of a parallelogram from a rectangle

Cut off triangle ABE and place in position of triangle DCF to change the parallelogram ABCD to rectangle BCFE

b. Show volume of a rectangular solid by building with cubic blocks

See Breslich: 1. Problems in Teaching Secondary School Mathematics
2. Teaching of Mathematics, Vol. I - Techniques

C. 1. Have pupils study the development of surveying instruments and devices and construct some of these to use in measuring a ball field, playground, etc. (See no. 6)

2. Use opaque projector to find and identify geometric designs of the following: cars, houses, flowers, Christmas cards, etc.

3. Show how [illegible] balance and symmetry [illegible] photography

4. Observe and list applications of cube, [illegible]

5. Use [illegible]

Photograph enlargements to show meaning of similar - also, dresses of same design but patterns cut in different sizes, blueprints, scale drawings.

6. Have pupils construct simple measuring devices to use in measuring playground, heights of trees, buildings, etc. See Seventeenth Yearbook, pages 199-205, Boy Scout Handbook, Eighteenth Yearbook.

Angle mirror
Hysometer
Plane Table
Surveyor's Cross

CONTENT

C. Indirect Measurement

1. Need for a history of indirect measuring instruments

2. Needed constructions and definitions
   a. Recall basic constructions
   b. Angles - right, straight, acute, obtuse
   c. Triangles - scalene, isosceles, equilateral, congruent, similar, equivalent

3. The right triangle
   a. Rule of Pythagoras (14) Square Root by Table and division (11) 3-4-5 right triangle (14)

   b. Tangent ratio (26)
   c. Scale Drawings (15)

4. Similarity of triangles, ratio, proportion, scale drawing (25,15,3)

REFERENCES

Filmstrips

Ratio & Proportion - Jam Handy	C
Basic Angles & Experimental Geometry SVE	C
Basic Triangles - SVE	C

Films

Measurement - State	A
Latitude & Longitude - State	A
Practical Geometry-Lines & Angles - U.Va., State	C
Geometry In Action - State	C

CONTENT

Unit III - Statistics

A. Facts expressed in numbers

1. Methods of gathering

a. Census

b. Sampling

2. Kinds of tables

B. Statistical Tables

1. Rank order table

2. Grouped - frequency table

C. Graphs

1. Bar graphs

2. Circle graphs

3. Line graphs

4. Picto-graphs

D. Interpreting Data

1. Frequency

2. Range

3. Mode

4. Median

5. Mean

REFERENCES

Information on state population may be secured from Bureau of Population and Economic Research, University of Virginia, and State Chamber of Commerce, Richmond, Virginia

Superintendent's Annual Report - C2, A2

Wartime and Post-War Shifts in U.S. Population, Dunn and Bradstreet Inc., Education Division, New York - Chart A,1

Graphs and Statistics, Los Angeles City School Districts, Curriculum Division, 1. Pico Blvd., Los Angeles, California Free . . C

Filmstrips

Graphs - SVE C

Graph Uses - Jam Handy C

Films

The Language of Graphs - States C

UNIT III
SUGGESTIONS TO TEACHERS

A. Facts Expressed As Numbers

1. Finding results of Federal Census

2. Finding results of school census

3. Reading about public opinion polls

4. Collecting various kinds of tables

B. Statistical Tables

1. Preparing tables to show rank of Virginia cities in population

2. Preparing tables to show group frequency of grades on a test

C. Graphs

1. Preparing bar graph to show age of class members

2. Showing relative cost of school operation by circle graph

3. Studying library books read by each member by means of a line graph

4. Comparing size of grades 8-12 (or 8-11) in form of pictograph

D. Interpreting Data

1. Using graphs previously prepared and ascertaining wherever possible

a.) Frequency
b.) Range
c.) Mode
d.) Median
e.) Mean

2. Securing from insurance companies statistical tables and comparing with data for members of class

CONTENT

Unit IV - Travel and Communication

A. Travel

1. History of travel where mathematics is used

2. Ways of travel

   a. Private automobile
   b. Bus
   c. Train
   d. Plane
   e. Boat

3. Services for travelers

   a. Time tables
   b. Maps
   c. Rates
   d. Reservations
   e. Methods of carrying money

REFERENCES

<u>It Tells How Often You Will Telephone</u>
Bell Telephone Laboratories, 463 West St., New York 14, (Poster) Free B,2

Information may be secured from the following agencies: Bell Telephone Laboratories, New York; U. S. Post Office, Washington, D. C.

<u>Map Reading Charts</u>, Denoyer-Geppert Co., 5235 Ravenswood Ave., Chicago, Ill. 35¢

<u>Air World Map</u>, Air Age Education Research, 30 E. 42nd Street., New York 17, Free

<u>Railroad Arithmetic</u>, Book II,
Baltimore & Ohio Railroad,
Baltimore, Md. Free

UNIT IV
SUGGESTED TEACHING ACTIVITIES

Continue to diagnose, use follow-up procedures, and reteach the fundamental processes whenever necessary.

A. 1. a. Tracing the development of travel from early stages to present date
b. Comparing time and expense of a trip in colonial days with present day

2. Analyzing such problems as:

a. What advantages and disadvantages of each method of travel would you consider before you made a trip?
b. What factors would determine the type of transportation?
c. Compute the approximate cost of a trip from Richmond to Detroit by plane, train, and bus
d. Compute the cost per person of a 400-mile trip by automobile at 8¢ per mile with the cost of the same trip by train at 3 3/8¢ per mile if the number of passengers in the automobile is (a) one, (b) two, (c) three, (d) four
e. How far does an airplane go in 10.3 hours at the rate of 250 miles an hour?
f. On a vacation trip, Tom's family traveled a distance of 342 miles in 6 hrs., 30 mins. What was the average rate per hour?
g. A train traveled 936 miles at an average speed of 52 mph. How long did it take for the trip?
h. The earth revolves on its axis at the rate of 1760 feet per second. What is that in miles per hour?

3. a. Collecting time tables, maps, and other information from railway offices, bus stations, and various agencies to use for study and references
For example, find the time of arrival and departure of trains and buses through your town
b. Making maps of time zones in the United States
c. Finding answers to such questions as:
1. What time is it in each of the time zones when it is 7 o'clock in your home?
2. If you need $500 for a trip, how would you carry this amount safely? How much extra would it cost?
3. What types of reservations can you make when you travel by train, plane or bus? How are these reservations made? What is the cost of such reservations?

B. 1. Collecting information on the development of communication and its connection with the growth of the science of mathematics. Show this information by means of a line or bar graph.

2. a. Listing all the ways of communication available to you and comparing them as to speed, cost, efficiency, convenience, reliability, and extent of use.
b. Working such problems as:
1. Collect information from U. S. Post Office and make table of rates and develop formulas for first and second class mail.
2. If the number of telephone calls in the United States grew in seven years from 30,300,000,000 to 35,115,000,000, find the per cent of increase
3. What is the relative cost of sending each kind of Western Union Message?
4. If a telegram of ten words cost 30¢, how much would it cost to send a twelve-word telegram?

c. Finding the opportunities for employment offered boys and girls of your age by the mail, radio, telephone, and telegraph companies. What future does it offer?

CONTENT

B. Communications

1. History of communications where mathematics is directly used

2. Means of communication

   a. Telephone
      1) Local
      2) Long Distance

   b. Telegram
      1) Regular
      2) Day letter
      3) Night letter
      4) Wireless
      5) Cablegram

   c. Mail services

   d. Newspaper

   e. Radio

   f. Television

REFERENCES

Information on travel may be secured from National Aeronautics Association, Washington; such railroad companies as B & O, N & W, C & O, and Greyhound Bus Lines.

Films

Maps Are Fun - Mad., Rad., Un. Va., State A,3

See Transportation

CONTENT

Unit V - Business in Ninth Grade

A. Keeping financial records

1. School Financial Records

2. Personal or Business Records

B. Studying Local Taxes

1. Raising money by taxes

2. Spending tax money

C. Buying and Selling

1. Buying

2. Selling

REFERENCES

Public Affairs Pamphlets:

"How Money Works"
"Credit Unions"
"Our Taxes and What They Buy" - Public Affairs Committee, 30 Rockefeller Plaza, New York

Level Farming on Sloping Fields
J. I. Case Co., Racine, Wis. Free A,2

Quarterly Retail Sales and Inventories
Dunn and Bradstreet, Inc., Education Division, New York - Free C

Commercial Failures in U. S., 1857 to Date
Dunn and Bradstreet, Inc., Education Division, New York - Free C

Financing Our Working Democracy
Taxation Makes the Wheels Go 'Round
Denoyer-Geppert Co., 6235 Ravenswood Ave., Chicago 40, Ill B, 1, 2

Our Taxes and What They Buy
Public Affairs Committee, Rockefeller Plaza, New York B

Films

Property Taxation - Long., Rad., State B

What Is Business? - State C

Getting Your Money's Worth - Rad., U. Va., State C

Meaning of Percentage - Long., State B, C

Bookkeeping and You - Rad., State A

UNIT V
SUGGESTIONS TO TEACHERS

A. Keeping financial records

1. Examining methods of keeping school financial records

   a. Cafeteria
   b. Athletics
   c. Miscellaneous

2. Setting up accounts of projects related to pupils' interests
   a. Farming
   b. Homemaking
   c. Other personal enterprises

B. Studying local taxes

1. Raising money by taxes
   a. Learning how assessments are made
      (1) Real Estate
      (2) Tangible Personal Property
      (3) Licenses
   b. Solving problems
      (1) Figuring rate
      (2) Figuring yield for county or city
      (3) Figuring individual tax yields
      (4) Figuring merchants' license taxes

2. Spending tax money
   a. Studying county or city budgets
      (1) School
      (2) General county or city
      (3) Welfare
   b. Preparing circle and bar graphs to show relative costs of budget units

C. Buying and Selling

1. Buying
   a. Buying wholesale and retail
      (1) Finding percent difference in cost
      (2) Computing discounts from list prices

2. Selling
   a. Studying profit and loss
      (1) Preparing graphs to show cost of retail selling under items such as rent, labor, cost of goods, etc.
   b. Calculating commissions on sales
   c. Using business forms
      (1) Preparing sales slips
      (2) Preparing invoices

CONTENT

Unit VI - Recreational Activities

A. Sports

1. Baseball
2. Soft ball
3. Football
4. Basketball
5. Swimming
6. Tennis
7. Volleyvall
8. Golf
9. Track
10. Other sports of local interest

B. Games

1. Horse shoes
2. Bingo
3. Ping-pong
4. Badminton
5. Card games
6. Monopoly
7. Aritho

C. Cost of Recreation

1. Picnics
2. Commerical amusements
3. Books
4. Camping
5. Boating

D. Puzzles

1. Number
2. Jig-saw
3. Riddles
4. Magic squares

E. Social Activities

1. Teen-Age Clubs
2. Class Socials
3. Club Socials

REFERENCES

A Rhythmic Approach to Mathematics, Laura E. Chistman, 1217 Elmdale Avenue, Chicago, Ill. 50¢

Brain Resters and Testers, & Puzzle Craft Cooperative Recreation Service, Delaware, Ohio. 25¢

Mathematics In Nature, 10¢; Illustrated Post Cards - Mathematics Designs, 5¢; The Franklin 16X16 Magic Square, 10¢; Scripta Mathematica Yeshiva Univ., 186th Street, New York 33, N. Y.

Topics In Mathematics for Programs of Recreation, School Science and Mathematics, P. O., Box 408, Oak Park, Ill. 25¢

List of Work on Mathematical Recreations, Schaaf Pictorial Mathematics, 186th Street, New York 33, N. Y.

Films

Playtown, U. S. A., - U. Va., State

UNIT VI
SUGGESTED TEACHING ACTIVITIES

Continue to diagnose, use follow-up procedures, and reteach the fundamental processes whenever necessary.

Note to Teacher: It is urged that the teacher plan carefully before using any of the topics in this unit to the end that mathematics will be used and emphasized.

A. Solving problems based on sports in your community such as:

1. Make a scale drawing of a baseball diamond, a volleyball court, a softball diamond; find the distance from home plate to second base by means of the scale used and also by means of the Pythagorean Theorem.
2. Lay off a softball diamond; a baseball diamond.
3. Keep a record of your high school team and find the total games won and lost; find the percentage standing.
4. Figure the batting averages of each member of your baseball team.
5. Find the volume of your local swimming pool. How many gallons will it take to fill it within one foot of the top?
6. Show by graph the achievements of your school team within the past ten years.

B. 1. Making original games based on Bingo, card games, etc., to show mathematical principles. For example: a game of Old Maid showing the relation of common fractions, decimals, per cents
2. Playing games that require mathematical computation, such as monopoly and aritho.
3. Calculating cost of various forms of recreation:
   a. Costs of uniforms and equipment for team sports
   b. Costs of picnics; calculating amounts of food needed
   c. Refer to recreational item in budgets to determine costs of well-rounded recreation.
   d. Costs of camping, hikes, etc.
   e. Costs of clubs; club budgets

C. 1. Conducting contests in which the students use mathematical puzzles.
2. Encouraging students to work mathematical puzzles such as:
   a. A Boy Scout went to a spring with 2 bottles, one of which held 3 pints and the other 5 pints. How could he manage to bring back just 4 pints.
   b. How long will it take the home economics class to cut a strip of cloth 35 yards long into strips 1 yard long, if each cut takes one minute?

D. 1. Preparing a budget for the activities of a teen-age club during a school session.
2. Planning a school picnic for a group of 37 students if each student brings 50¢.
3. Finding the profit from club projects such as:
   A club sold 75 boxes of Christmas cards at $1.00 per box. The club received 30% profit on the first 10 boxes, 40% on the next 25, and 50% on the remainder. How much did the club receive?

COURSE OF STUDY
TWELFTH GRADE
GENERAL MATHEMATICS

(Competences are denoted by numbers following items in content).

CONTENT

Unit I - Statistics

A. Compiling statistical data

1. Methods of gathering

2. Making tables

3. Making graphs

B. Drawing conclusions from statistical data

1. Computing

a. Average

b. Mean

c. Mode

d. Median

e. Frequency

f. Percentile

g. Norm

2. Translating figures into significant statement

REFERENCES

Graphs and Statistics, Los Angeles City Districts, Curriculum Division, 1205 W. Pico Blvd., Los Angeles 15, Calif.; Free B

Approximate Computation, Gage, Univ. of Florida, Gainesville, Fla. A

Mathematical Statistics Speeds Mass Production, Sci. M71941. B

Graphical Solution of Equations, The Mathematics Teacher, April 1947. B

Filmstrips

Graph Uses - Jam Handy A, 3

Unit I

SUGGESTIONS TO TEACHERS

A. Compiling statistical data

1. Gathering information
   a. About weather
   b. About trends in prices
   c. Using sampling method

2. Making tables
   a. Arranging variations according to dates
   b. Arranging per cents according to ranks
   c. Arranging class grades according to frequency

3. Making graphs
   a. Preparing graph to show age-grade distribution of your school
   b. Drawing a formula graph
   c. Preparing graph to show both positive amd negative values

B. Drawing conclusions from statistical data

1. Computing from tables previously compiled
   a. Average
   b. Mean
   c. Mode
   d. Median
   e. Frequency
   f. Percentile
   g. Norm

2. Selecting tables and graphs and making them understandable by significant statements which explain the findings

(Competences are denoted by numbers following items in content).

CONTENT

Unit II - Home Finances

A. Home Finances

1. Family Income

a. Wages
b. Salary
c. Other Sources

2. Owning vs. Renting

a. Original cost
b. Upkeep
c. Depreciation
d. Insurance
e. Taxes
f. Utilities

3. Family Expenses

a. Furniture
b. Food
c. Clothing
d. Recreation
e. Contributions
f. Owning a car
g. Medical expenses
h. Savings
i. Miscellaneous

REFERENCES

Personal Money Management, American Bankers Assn., 12 East 36th Street, New York 16; 25¢ A, 3

Budgeting, Boston Better Business Bureau, Education Division, Boston, Mass.; 5¢ A,3

One Hundred Problems in Consumer Credit, Foundation for Economic Research, Jafferty New Hampshire; 10¢ A

Budgeting, Educational Research Bureau 1217 13th Street, Washington, D. C.; 10¢ A

Films

Installment Buying - State A, 3

Consumer Protection - State A

What Is A Contract? - State A

Unit II

SUGGESTED TEACHING ACTIVITIES

A. 1. Estimating the total income of a family by including wages, salary, commissions, interest from investments, income from annuities, sale of produce, income from a business, etc., after withholding taxes, social security, and retirement deductions have been made.

2. Comparing the advantages and disadvantages of owning or renting a home by the discussion and solving of such problems as:

a. Mr. Jones bought a home for $8,000. The house is worth $7,000 and the lot $1,000. He used $3,000 of his money and had to borrow the balance at 5% interest. What is the annual cost of owning this home if the upkeep is estimated at 2.5% depreciation at 3%, and interest on investment at 3%? Use local taxes and insurance rates.

b. Compare the rent on a similar home in your community with the cost of owning in the above problem.

c. What factors are involved in owning a home that are not involved in renting?

d. Investigate the cost of utilities for a home in your community.

3. a. Preparing a budget using the family income and all the expenses, including 10% savings. Show this data by use of circular distribution graph.

b. Comparing costs involved in cash buying, credit buying and installment buying.

(Competences are denoted by numbers following items in content).

CONTENT

Unit III - Financing A Business

A. Private Ownership

B. Partnership

C. Corporation

D. Chain

E. Cooperative

Unit III

SUGGESTED TEACHING PROCEDURES

A. 1. Comparing and contrasting the five types of business organizations, giving the features, advantages, and disadvantages of each.

2. Considering such problems as:

a. Select a business in which you are interested; determine the amount of capital needed and how this capital will be used.

b. A, B, and C own a furniture store. A invested $10,000; B, $7,000; and C, $8,000. In a certain year they made a net profit of $15,000. If profits are divided according to investments, how much will each man receive?

3. Investigating the procedure necessary to form a corporation, emphasizing the mathematical approach and the terminology involved.

(Competences are denoted by numbers following items in content).

CONTENT

Unit IV - Investments

A. Investments (1) (2) (6) (27) (28) (29) (7) (8)

1. What constitutes a sound investment?

   a. Reliability of investment
   b. Diversity of investments
   c. Income from investment
   d. Speculation
   e. How government protects investments

2. Government bonds and postal savings.

3. Bank savings accounts - simple and compound interest

4. Stocks

5. Bonds

6. Real Estate

7. Mortgages

8. Building and Loan Associations

9. Social Security

10. Insurance

REFERENCES

Breslich, Problems in Teaching Secondary School Mathematics; pp. 57-63.

Consumer Education Study, 1201 16th Street, N.W., Washington 6, D. C., Buying Insurance.

Life Insurance Fact Book, Institute of Life Insurance, 60 E. 42nd Street, New York 17, N. Y. B, 10

Investment Companies (B,1) & Life Insurance (B,10), Boston Better Business Bureau, Education Division, Boston, Mass.; 5¢ each.

Types of Banks, How They Serve You, The Posterama Series, New York Clearing House, 77-83 Cedar Street, New York 5, N. Y.; Free. B, 3

How Lucky Is My Social Security Number?, International Ladies Garment Workers Union, Education Dept., 1710 Broadway, New York 19; 10¢ B, 9

Facts You Should Know About Series, National Better Business Bureau, Inc., Chrysler Bldg., Lexington Ave., New York 17, 5¢; B, 1

What Everybody Ought to Know About This Stock and Bond Business, Merrill, Lynch, Pierce, Fenner and Beane, Board of Trade Bldg., Chicago, Ill.; Free. B, 4, 5

Films

Work of the Stock Exchange - State B

Mr. and Mrs. America - State. B, 2

Using the Bank - Mad., U. Va., State B

Unit IV

SUGGESTIONS FOR TEACHING

1. Have pupils bring newspapers to class and select certain stock that they want to invest in. Then determine a sum of money, say $2,000, to invest. Follow these investments for a period of several weeks. Then have each report whether he lost or gained and the per cent of loss or gain in the investment.

2. Graph the rise and fall of various stock and insurance companies through a period of years.

3. Have pupils select stock sold below and above par to determine the rate of income on the investment. Determine which ones they would invest in. Why?

4. Make a collection of various kinds of bonds, stock certificates, and insurance policies.

5. The Unit should lead pupils to consider seriously the importance of savings and how to invest wisely. Avoid the get-rich-quick idea.

6. Have pupils study the Social Security Act of 1935 and determine how much Social Security credit each would have on a chosen salary for a certain year.

7. Have pupils read charts, comparing the amount of insurance on policies taken out at different ages and on different kinds of insurance. Account for these differences.

8. Compare the results of different companies.

9. Make a study of the sources of investments in the community.

10. Organize stock companies.

(Competences are denoted by numbers following items in content).

CONTENT

Unit V - Government - State and Federal

A. State

I. Studying the sources of State funds.

II. Spending money for State and local purposes.

B. Federal

I. Studying the sources of Federal funds.

II. Spending money for Federal and State purposes.

REFERENCES

Simple Facts About Your Income Tax, Pusinelli Publications, 19 W. 44th St., New York 18, N.Y.; 25¢ B, 1

Financing Our Working Democracy - Taxation Makes The Wheels Go 'Round, Denoyer-Geppert Co., 5235 Ravenswood Ave., Chicago Ill.; B

Federal Budget, Director of Budgets, U. S. Govt. Documents, Washington, D.C. A

State Budget, Director of Budgets, Governor's Office, Richmond, Va. B

Information on the Federal Budget may be secured from the Dept. of the Interior, Washington, D. C. and from Va. Representatives and Senators in Congress, Washington, D. C.; U. S. Post Office Dept., Washington, D. C.

Films

Property Taxation - Long., Rad., State A

Federal Taxation - State B

Unit V

SUGGESTIONS TO TEACHERS

A. State

I. Studying the sources of State funds

1. Finding the main sources of State revenue
   a. Special Fund taxes
   b. General Fund taxes
   c. Profit from business
   d. Federal appropriations

2. Solving problems of State revenue
   a. Studying the gas tax-per cent of cost, total tax to individual
   b. Examining forms used and computing State Income Tax
   c. Learning about profit on A.B.C. sales and how proceeds are appropriated
   d. Finding per cent of road and school funds from Federal govt. in Va.
   e. Finding total yield on a 2% and 3% general sales tax

II. Spending money for State and Local purposes

1. Examining State Budget and preparing graphs to show relative amounts to various State Departments
2. Finding per cent of total school appropriation for higher institutions of learning, vocational education, administration, elementary, and secondary schools, etc.
3. Studying relative proportion of salaries of local officers, paid by state
4. Finding unit costs of road construction and maintenance.

B. Federal

I. Studying the sources of Federal funds

1. Finding the main sources of Federal revenue
   a. Customs duties
   b. Internal revenue

2. Solving problems of Federal revenue
   a. Finding the import duties on several commodities at given rates
   b. Computing the per cent of Federal income from import duties
   c. Examining forms used and computing Federal Income Taxes
   d. Learning about and working problems in Federal excise taxes

II. Spending money for Federal and State purposes

1. Examining Federal Budget and preparing graphs to show relative amounts to various departments and agencies

2. Finding per cents for various items of budget

3. Comparing income and expenditures of Post Office Department

4. Finding per capita amounts for

   a. Federal debt
   b. Federal deficit
   c. Federal expenditures