Survey of practices in general mathematics in the secondary schools of Wyoming

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A SURVEY OF PRACTICES IN GENERAL MATHEMATICS
IN THE SECONDARY SCHOOLS OF WYOMING

by

CHARLES WILLIAM POPOVICH

B. S. Montana State College, 1950

Presented in partial fulfillment
of the requirements for the degree of
Master of Education

MONTANA STATE UNIVERSITY
1954

Approved by:

James E. Short
Chairman, Board of Examiners

Date

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CHAPTER I

INTRODUCTION

General mathematics in Wyoming assumes many forms from simple arithmetic to relatively complicated consumer mathematics. However, adequate information about these courses has not been generally available to the teachers. The information which has been available was rather limited in scope and dealt only with certain specific problems in a few schools. This study was conducted for the purpose of obtaining information about the common practices in general mathematics in the secondary schools of Wyoming.

This survey included only the common practices that existed in the general mathematics courses of the high schools and three-year junior high schools of Wyoming. No attempt was made to include courses offered below the ninth grade. The survey was not exhaustive in any one area, and the information obtained must be limited to the point in question. The information presented was designed to give an overview of general mathematics in the secondary schools of Wyoming. The results which were obtained will provide general information about topics such as: the place of general mathematics in the curricula of Wyoming schools, the selection and enrollment of students in the general
mathematics classes, the textbooks and classroom materials being used in the general mathematics classes, and the teachers of general mathematics.

The information for this study was obtained by means of a carefully planned questionnaire. Numerous resources were read in order to determine more accurately which questions might be most important. The findings of the survey are reported as briefly and clearly as possible with the aid of numerous tables. A general overview of the research in the field of general mathematics is presented in Chapter II in order to provide some means of comparison between the findings of this study and the findings of other studies which were conducted in other parts of the United States.
CHAPTER II

REVIEW OF LITERATURE

Before the beginning of the twentieth century the high schools of America were coming into their own, and the general pattern of education was changing. In an effort to meet these changes as well as the changing social order there were numerous changes in the school curricula. Most of these were relatively haphazard and served only to stimulate efforts to study the curricula and the needs of the child in greater detail.

In the area of mathematics, efforts were being made to improve the offerings. A large number of individuals and many organised groups have been given credit for aiding and speeding the development of secondary mathematics. Wren summarized this growth briefly:

In the 1894 report of the Committee of Ten, definite recommendations were made for the reorganization of secondary mathematics. Subsequent groups which made significant recommendations were the Committee on College Requirements, the International Commission of the Teaching of Mathematics (1911-18), the National Committee on Mathematical Requirements (1923), and the College Entrance Board (1923, 1925). In its report (1940) the Joint Commission of the Mathematical Association of America, Inc. and the National Council of Teachers of Mathematics undertook to construct a mathematical curriculum for the junior high school, senior high school, and the junior college which would provide the necessary continuity of instruction and yet permit a desirable flexibility of administration. The National Council of Teachers of Mathematics, the Central Association of Science
and Mathematics Teachers, and the Mathematical Association of America have been especially influential in shaping the direction and progress of secondary mathematics.

Beckmann lists three reports which had special importance in the movement for mathematical reform:


3. Commission on Secondary School Curriculum of the Progressive Education Association, Mathematics in General Education, 1940.2

All of these groups and their reports undoubtedly had an influence on the mathematical curriculum of the secondary schools. The growth and development of the mathematics programs in use today have been a long and continuous process accomplished only with the aid of many individuals and many organized mathematical groups. Changes are still being made and new trends are developing.

One of the most significant trends has been the gradual decrease in the emphasis on traditional3 mathematics courses and an increase in emphasis on new courses.


3The traditional mathematics courses include Algebra I, Algebra II, Plane Geometry, Solid Geometry and Trigonometry.
Many courses of a specialized nature have been offered to the student, but the greatest single offering has been in a type of course of a more general nature. The name given to these generalized courses is usually general mathematics. These courses took on various forms and had different purposes in the different schools. Gradually there became increasing alarm that general mathematics was fast becoming a "dumping ground" for the student less proficient in mathematics. Despite its many uses, and abuses, courses in general mathematics are being offered as part of the regular curriculum of most of the larger schools and many of the smaller ones.

A large number of reports and studies have been made on the problems of general mathematics. Many of these seem to be all inclusive, and a smaller number are reports on specific areas of general mathematics. Only a few of the available reports can be mentioned here, and the reader is referred to the bibliography for others.

A study by Schaaf\(^1\) made an effort to determine the trends in junior high school mathematics. The results, based on 152 replies from twelve states, seemed to indicate that the trend in these schools was away from algebra in the ninth grade toward some type of unified, general, or cumulative mathematics.

Two reports on mathematics which give an excellent

general summary along with many specific suggestions were published in 1944 and 1945. These reports by the Commission on Post War Plans, edited by William Reeve1, cover mathematics in general from grades one through fourteen. One section of these reports gives a check list which can be used as the main goal of mathematics teachers. Several sections of these two reports seem to emphasize functional competence of mathematics, which is often mentioned and discussed in papers on general mathematics.

The Florida State Department of Education and the College of Arts and Sciences of the University of Florida sponsored a study under the direction of William A. Gager2 for the purpose of improving certain parts of the present mathematics curriculum. Out of this study of general mathematics came the conclusion that all high school pupils not enrolled in the traditional mathematics courses should be required to take both ninth-grade and tenth-grade functional mathematics courses. Functional mathematics courses for the eleventh and twelfth grades should be made available to all pupils who choose to elect them. The foregoing is but one study that recommended several years of functional mathematics rather than just the usual one year.


Considerable effort has been directed along the lines of a "double track" program of mathematics in the secondary schools. The "double track" system offers the traditional courses along with another sequence of courses such as general mathematics I, general mathematics II, and sometimes general mathematics III and IV. A recent study on the "double track" program was conducted in Kansas by Anderson and Dixon.¹ A number of other studies seem to support the "double track" program of secondary mathematics.

Two years of general mathematics in sequence has been shown superior to a course in algebra followed by a course in geometry. McCormick² showed this was true in his report twenty-five years ago. Reeve³ and many others have supported McCormick's study with further investigation.

A recent study by Irvin Lee gives a summary of the status of mathematical offerings in ninety-two selected secondary schools. Lee summarized one part of his findings when he wrote:

Seventy-four of the ninety-two cooperating schools offered either a three track or a multiple track mathematics program; sixteen offered a double program at


the ninth or twelfth grade level or at the ninth and
twelfth grade level; twenty-nine offered related math-
ematics in connection with industrial arts and agricul-
tural curricula; and nine offered special-interest
mathematics courses for girls in home-making, household
arts, or pre-nursing curricula. Forty-three of the
schools offered their non-traditional mathematics in
two-to-four year sequence, and thirty-three offered
two or three differentiated non-traditional courses.¹

The 1948-49 report by the U. S. Office of Education²
shows general mathematics as one of three subjects outstand-
ing in its percentage increase. In 1934, 7.4 per cent of all
students in high schools were enrolled in general mathematics
courses. In 1949, the enrollment had grown to 13.1 per cent.
The report shows a corresponding decrease in enrollments in
algebra and geometry.

The state departments of education supplied informa-
tion for a study by W. I. Layton³ on the statewide mathe-
matical requirements for graduation from high school. Twenty
of the forty-eight states required no mathematics, twenty-
four required one unit, one required one and one-half units,
and one required two units. This study showed that 57 per
cent of the states require some mathematical training in
all of their four-year high schools. This percentage is

¹Irvin Lee, "The Organization of Instruction in
Arithmetic and Basic Mathematics in Selected Secondary
Schools," The Mathematics Teacher, Vol. XLVI, April 1953,
pp. 235-40.

²U. S. Office of Education, "Offerings and Enroll-
ments in High School Subjects—1948-49," (Washington D. C.,

³W. I. Layton, "The Mathematics Required for Grad-
exceeded by social studies, English, and science.

The content of a course in general mathematics seems
to vary considerably from school to school. There seems to
be a wide range of opinion among the teachers as to what
should be included in a course in general mathematics.

Kenneth E. Brown reported on two studies which deal with
the course content of general mathematics:

In 1942, after analyzing more than fifty text-
books in general mathematics, 458 questionnaire an-
swers from colleges, and the opinions of 1500 students
I reached the following conclusions: (1) According to
the authors of the texts and the teachers of the sub-
ject, general mathematics could be classified into
three divisions based on the objectives of the course
as follows; (A) preparatory--to equip the students
for a profession, semi-profession, or a vocation in
which mathematics is a useful tool (B) cultural--to
prepare students to be intelligent citizens mathematically . . . . (C) combined preparatory and cul-
tural--to attain both the above objectives . . . .
From a 1949 survey, based on opinions of 900 teach-
ers, regarding the importance of certain topics in a
 cultural general mathematics course it was found that
great emphasis was placed on these topics: arith-
metic, consumer problems, algebra, mental arithmetic,
statistics, trigonometry, geometry, . . . .

Textbooks for general mathematics have been topics
for considerable study. There seems to be only a limited
amount of agreement among authorities as to what should be
included. A review of twenty-three texts published from
1934-40 was made by Faith Novinger and points out the dif-
fences in content of the general mathematics texts:

Arithmetic is the sole category on which all of
them agree as essential to ninth-grade mathematics.
Commercial arithmetic ranks second; geometry is third

1Kenneth E. Brown, "The Content of a Course in
General Mathematics--Teacher's Opinions," The Mathematics
in rank; and algebra fourth, in their opinion. These are followed in order by social uses, consumer training, graphs, industrial arithmetic, trigonometry, tables, history of mathematics, and miscellaneous.¹

The use of projected aids and other multi-sensory aids in the mathematics classroom was the subject of a survey of 150 public schools in Massachusetts made by Sayer and Ingenieri.² The survey attempted to determine which aids were available and to what degree they were used by the teachers. The four aids reported most often used were solid geometry models, mathematics books other than the regular mathematics text, book shelves and cases, and slide rules. The four projected aids which were found to be most often available to the teachers were lantern slides, sound films, strip films, and silent films.


CHAPTER III

MAKING THE SURVEY

Careful consideration of the major topics of study in the area of general mathematics and discussion with a number of mathematics teachers resulted in the development of a questionnaire which would be suitable for finding out more about general mathematics as it is taught in the secondary schools of Wyoming. An effort was made to cover as many of the major topics about which there seemed to be inadequate information as was practical to include in a two page questionnaire.

Questionnaires were sent to the 101 accredited junior and senior high schools of Wyoming. Seventy-three replied for a percentage return of 72.3. All but two of the junior high schools were organized on a two-year basis and these offered only the conventional seventh and eighth grade arithmetic. For this reason only the replies from the three-year junior high schools were included in the results of the survey. This meant that sixty-eight usable replies out of a possible ninety were received for a 75.6 per cent return. Since the high schools of Wyoming are classified as first class, second class, third class, and junior high, the tables throughout this study will separate the responses whenever this helps to clarify the information given. A
summary of the standards used for classifying the schools follows:

The standards used in Wyoming for determining the class of a high school are the same as the standards of the North Central Association of High Schools. Specific standards are determined for the following: school plant, sanitation, and janitorial service; science laboratories and school library; records; requirements for graduation; the teaching load; the pupil load; and athletics. Standards for the three classes of high schools are based on these major items and vary mainly in the degree of rigidity of each standard. The capability of offering a student a complete and well balanced education in a Class II school would be better than in a Class III school. Likewise, the Class I schools would be superior to the Class II schools.¹

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>NUMBER AND PERCENTAGE OF QUESTIONNAIRES RETURNED FROM NINETY SECONDARY SCHOOLS IN WYOMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of High School</td>
<td>Number of Schools</td>
</tr>
<tr>
<td>Class I</td>
<td>41</td>
</tr>
<tr>
<td>Class II</td>
<td>21</td>
</tr>
<tr>
<td>Class III</td>
<td>26</td>
</tr>
<tr>
<td>Junior High</td>
<td>2</td>
</tr>
<tr>
<td>Totals</td>
<td>90</td>
</tr>
</tbody>
</table>

Of the twenty-two schools that did not reply to the questionnaire, seventeen had enrollments less than eighty-five; and of these, nine had enrollments less than fifty.

¹Based on information received from the State Department of Education, Cheyenne, Wyoming.
CHAPTER IV

REPORT OF THE FINDINGS

In order to determine what mathematics courses were taught by the schools of Wyoming, a simple check list was provided for indicating the course offered and the year offered in the usual sequence. Table II shows the pattern of courses offered in Wyoming to be much like the traditional set-up which existed for many years prior to the introduction of general mathematics in the curricula of American schools. The only real difference is the addition of a general mathematics course.

TABLE II

MATHEMATICS COURSES OFFERED BY SIXTY-EIGHT SECONDARY SCHOOLS IN WYOMING AND THE YEAR OFFERED IN THE USUAL SEQUENCE

<table>
<thead>
<tr>
<th>Name of Course</th>
<th>Ninth</th>
<th>Tenth</th>
<th>Eleventh</th>
<th>Twelfth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>53</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Algebra II</td>
<td>6</td>
<td>34</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Plane Geometry</td>
<td>2</td>
<td>48</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Solid Geometry</td>
<td>1</td>
<td>17</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Trigonometry</td>
<td>46</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>General Math I</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>General Math II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Courses</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

The names of the courses which were listed under "other courses" included business mathematics, technical...
mathematics, shop mathematics, senior mathematics, and
economic mathematics. Four schools indicated that senior
mathematics was offered to twelfth-year students for the
purpose of insuring that graduates would have a good, well-
rounded, working knowledge of the basic mathematical funda-
mentals immediately before leaving high school. One of the
schools had a somewhat unusual system. At the end of the
junior year all students are required to take an examination
in mathematics which is used to measure the student's profi-
ciency in the mathematical fundamentals. All students who
do not obtain a satisfactory score are required to take the
course in senior mathematics. Other seniors may enroll if
they wish.

The reader may wonder why ninth-year students are
permitted to take plane geometry. On both questionnaires
the explanation was given that algebra and geometry were
necessarily alternated due to the small school enrollment.
According to some of the comments on the questionnaires, a
number of smaller schools had to adjust their curriculum
from year to year in order to meet the needs of the students.

A second year of general mathematics was offered in
only four of the schools despite the work in recent years
on the benefits of a second year of general mathematics.
The second year of general mathematics has been encouraged
as part of the "double track" system used by many schools
in the United States today.

General mathematics and algebra were the two courses
offered most often to ninth-graders. The number and per
-15-
cent of schools offering these courses is summarized in Table III. Slightly less than one half of the schools replying offered both general mathematics and algebra to their ninth-grade students last year.

TABLE III

THE NUMBER AND PER CENT OF SCHOOLS OFFERING ALGEBRA, GENERAL MATHEMATICS, OR BOTH TO THEIR FRESHMAN DURING 1953-54, FOR SIXTY-SIX SECONDARY SCHOOLS IN WYOMING

<table>
<thead>
<tr>
<th>Type of High School</th>
<th>Both General Math and Algebra I</th>
<th>General Math Only</th>
<th>Algebra I Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>25</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Class II</td>
<td>3</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Class III</td>
<td>1</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Junior High</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>31</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Per Cent</td>
<td>47.0</td>
<td>21.2</td>
<td>31.8</td>
</tr>
</tbody>
</table>

Fifty-three per cent of the schools replying offered only general mathematics or algebra to their ninth-graders last year. One school indicated that general mathematics and algebra were given on alternate years, and one stated that general mathematics was given except when an "exceptional class" came along. Enrollment of the school had much to do with determining whether or not both courses could be offered. A comparison of the number of schools which offer only general mathematics or algebra seems to indicate that when only one course is offered algebra is given preference.

As shown before, graduation requirements seem to vary considerably between states. Table IV summarizes the mathematical requirements for graduation in sixty-three
Wyoming schools. The information given in Table IV applies only to the minimum requirements. Seven schools have double requirements. These seven schools require two years of mathematics for all students who want to be recommended for college entrance. One school has a triple requirement: one mathematics course for the general student, two for the college preparatory course, and three for the scientific course.

**TABLE IV**

**THE MINIMUM NUMBER OF MATHEMATICS COURSES REQUIRED FOR GRADUATION, FOR SIXTY-THREE WYOMING SECONDARY SCHOOLS**

<table>
<thead>
<tr>
<th>Type of High School</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Junior</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Schools That Require One Mathematics Course</td>
<td>25</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>Number of Schools That Require Two Mathematics Courses</td>
<td>7</td>
<td>4</td>
<td>10</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

A comparatively large number of Class I schools require only one year of mathematics for graduation; whereas, a comparatively large number of Class III schools require two years of mathematics for graduation. The limited curriculum of most Class III schools leaves the student little choice for other courses than those deemed necessary for college entrance requirements.

General mathematics and algebra have usually been courses for the ninth-year student, and the students were usually directed into one course or the other during the
freshman year. Table V shows the enrollment figures for algebra and general mathematics courses in thirty-one schools.

TABLE V

ENROLLMENT IN THE GENERAL MATHEMATICS AND ALGEBRA CLASSES FOR THE THIRTY-ONE WYOMING SECONDARY SCHOOLS WHICH OFFERED BOTH COURSES TO THEIR FRESHMAN IN 1953-54

<table>
<thead>
<tr>
<th>Name of Course</th>
<th>Enrollment</th>
<th>Per Cent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Mathematics</td>
<td>1556</td>
<td>47.7</td>
</tr>
<tr>
<td>Algebra I</td>
<td>1702</td>
<td>52.3</td>
</tr>
<tr>
<td>Totals</td>
<td>3258</td>
<td>100.0</td>
</tr>
</tbody>
</table>

A comparison between the number enrolled in general mathematics courses and the total school enrollment in these same schools shows that 14.9 per cent of the total student body is taking general mathematics and 16.3 per cent is taking algebra.

A further look at the enrollment figures shows that 251, or 16.2 per cent, of the general mathematics students are not ninth-graders. An effort was made to determine the reason, or reasons, why students other than ninth-graders are taking general mathematics. Thirty-three of the fifty-five responses received indicated the non-ninth-grade student in general mathematics usually has either failed general mathematics or algebra before. This seems to indicate that the non-ninth-grade pupil in the general mathematics course is apt to be there because of having previously failed some high school mathematics course.
In an effort to find out more about the enrollment procedures and practices used in the Wyoming schools several different questions were asked. In answer to the question, "In your opinion has the method of enrolling and selecting general mathematics students been entirely satisfactory?" twelve replied "yes" and thirty-three replied "no".

An important problem in the enrolling of students in ninth-year mathematics has centered around the better student and what course he should take. Some teachers seem to feel that the better student should have algebra whether or not he ever intends to go to college. Others feel that only those who are certain they will need algebra in their chosen careers should take algebra. Table VI shows the responses to one question associated with this problem.

<table>
<thead>
<tr>
<th>Type of High School</th>
<th>&quot;Yes&quot;</th>
<th>&quot;No&quot;</th>
<th>No Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>23</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Class II</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Class III</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Junior High</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>36</td>
<td>13</td>
<td>19</td>
</tr>
</tbody>
</table>

The problem of enrolling students in the proper course is definitely an important one as the student's entire career may be effected by wrong decision. A number of
devices are sometimes used to aid the student in making this important decision. Three of the schools indicated that the Iowa Algebra Aptitude Test was used as an aid in determining which students enroll in algebra. One of these schools stated that students whose scores were below the twentieth or thirtieth percentile were excluded from algebra. Another school indicated that the twenty-fifth percentile was used as the criterion for 1953-54 but added, "This was too low and will be raised to at least the thirtieth percentile next year." A number of other factors are sometimes used as shown by Table VII.

**TABLE VII**

A FREQUENCY TABULATION OF THE FACTORS USED BY SIXTY-EIGHT WYOMING SECONDARY SCHOOLS FOR DETERMINING WHICH STUDENTS TAKE GENERAL MATHEMATICS AND WHICH STUDENTS TAKE ALGEBRA

<table>
<thead>
<tr>
<th>Factor Used</th>
<th>Type of High School</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Junior</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student's Desire</td>
<td></td>
<td>22</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Student's Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Record</td>
<td></td>
<td>17</td>
<td>3</td>
<td>2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Grade</td>
<td></td>
<td>11</td>
<td>4</td>
<td>1</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td></td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>I. Q.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement From</td>
<td></td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Previous Teacher</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra Aptitude Test</td>
<td></td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Reading Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mental Age</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

In nearly every instance, schools checked more than
one factor; and almost all schools checked either student's
desire or student's academic record. The response "others"
included two each of parents' request and student's intent to
attend or not attend college. The remaining response stated
the size of the class was a factor in determining whether
the student took algebra or general mathematics.

In order for a student to make a wise choice of
courses he should receive aid from some individual or group
of individuals. There may be some duplication since one
person may come under more than one heading but Table VIII
attempts to show which persons aid the student most in plan-
ning his course of study.

**TABLE VIII**

The Person(s) That Generally Aids the Student Most in
Determining in Which Courses the Student Enrolls, According
to Responses from Sixty-Eight Wyoming Secondary Schools

<table>
<thead>
<tr>
<th>Person or Persons Aiding the Student</th>
<th>Type of High School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class I</td>
</tr>
<tr>
<td>Principal</td>
<td>17</td>
</tr>
<tr>
<td>Eighth-Grade Teacher</td>
<td>13</td>
</tr>
<tr>
<td>Student's Parents</td>
<td>12</td>
</tr>
<tr>
<td>General Math Teacher</td>
<td>4</td>
</tr>
<tr>
<td>Counselor</td>
<td>7</td>
</tr>
<tr>
<td>A Combination of Some of These in Conference</td>
<td>3</td>
</tr>
<tr>
<td>Homeroom Teacher</td>
<td>2</td>
</tr>
<tr>
<td>Ninth-Grade Teacher</td>
<td>3</td>
</tr>
<tr>
<td>All Others</td>
<td>8</td>
</tr>
</tbody>
</table>

From Table VIII the general mathematics teacher seems
to have comparatively little to do in guiding the student.
into or out of general mathematics. On the other hand, the principal is mentioned most and is apparently quite influential in determining which courses the students select. A particularly encouraging response is indicated by six schools that checked the response "a combination of some of these in conference." The combinations indicated were:

1. principal, eighth-grade teacher, and parents
2. general mathematics teacher, eighth-grade teacher, and parents
3. counselor, principal, and student's advisor
4. superintendent, teacher, and student
5. student's advisor and principal
6. parent and teachers

The purpose of general mathematics in the curriculum has caused considerable discussion in recent years. Table IX seems to indicate that in about two thirds of the schools general mathematics was offered primarily for the student weak in mathematics.

TABLE IX

OPINIONS FROM FIFTY SECONDARY SCHOOLS IN WYOMING ON WHETHER OR NOT THE GENERAL MATHEMATICS COURSE IS PRIMARILY A TERMINAL COURSE FOR THE STUDENT WEAK IN MATHEMATICS

<table>
<thead>
<tr>
<th>Type of High School</th>
<th>Reply Received</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Yes&quot;</td>
</tr>
<tr>
<td>Class I</td>
<td>20</td>
</tr>
<tr>
<td>Class II</td>
<td>7</td>
</tr>
<tr>
<td>Class III</td>
<td>4</td>
</tr>
<tr>
<td>Junior High</td>
<td>2</td>
</tr>
<tr>
<td>Totals</td>
<td>33</td>
</tr>
</tbody>
</table>

A few typical comments supplied by those who indicated that general mathematics was primarily a terminal
course for the student weak in mathematics would include:

1. Some cannot get algebra because they absolutely do not know their arithmetic.
2. I believe this should be the one last chance to teach them whatever fundamentals they lack.
3. It is used here for teaching the fundamentals only, but there is a desperate need for a general mathematics course for the average and above average student.
4. If they don't have the ability to do algebra they cannot go beyond general mathematics.
5. It is used for that purpose in this school but it shouldn't be. (five similar replies)

A few typical comments supplied by those who indicated that general mathematics was not primarily a terminal course for the student weak in mathematics would include:

1. The students will have to take senior math if they do not make a passing score on a test given at the end of their junior year.
2. We use it to combine all mathematics courses into one course for college preparatory or life adjustment for students.
3. It is too difficult for any but the most advanced seniors.
4. It is an introduction to algebra and lays a foundation for algebra.
5. It should be a review course—an introductory course perhaps. I am toying with the idea of requiring general math in grade nine with algebra for the tenth grade.
6. Many students use it as a foundation for algebra. Also, it gives many of them the courage to take algebra after having achieved success in general mathematics.

All of these comments, as well as the responses recorded in Table IX, seem to show that considerable difference of opinion exists among the teachers of Wyoming, as to what purpose general mathematics should serve. In order to better meet the purposes for which the general mathematics

\[1\text{Numerous other comments were received, but the ones listed were selected as representative.}\]
course is used a variety of textbooks and materials are available.

A total of twenty-nine different textbooks were being used in the general mathematics classes of forty-nine Wyoming schools. About 20 per cent of the schools reporting listed more than one text. Eleven of the texts were used by more than one school; however, no more than six schools used any one text. The six textbooks most often used were:

1. Nelson and Grime, Making Mathematics Work
2. Stein, Fundamentals of Mathematics
3. Patton, Mathematics We Use
4. Lasley and Mudd, New Applied Mathematics
5. Patton and Young, New Standard General Mathematics
6. Hawkins and Tate, Your Mathematics

In response to the question, "In your opinion has any one text been entirely satisfactory in meeting the needs of the general mathematics students?" twelve replied "yes", and named the following ten books:

1. Brueckner, Arithmetic We Use
2. Edgerton and Carpenter, General Mathematics
3. Lasley and Mudd, New Applied Mathematics
5. Patton and Young, Using Mathematics
6. Patton and Young, New Standard General Mathematics
7. Patton, Mathematics We Use (named by two schools)
8. Schorling and Clark, Mathematics in Life
10. Stein, Refresher Arithmetic (named by two schools)

The major shortcomings of the general mathematics texts were grouped into nine general areas and tabulated in Table X.

1These six texts are given in order of frequency. A complete list of the texts used is given in the appendix.
TABLE X

THE MAJOR SHORTCOMINGS OF THE GENERAL MATHEMATICS TEXTS AS INDICATED BY FORTY-FOUR TEACHERS WHO BELIEVE THE GENERAL MATHEMATICS TEXTS DO NOT MEET THE NEEDS OF THE STUDENT

<table>
<thead>
<tr>
<th>Major Shortcoming of Texts</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate or Too General</td>
<td>17</td>
</tr>
<tr>
<td>Coverage of Topics</td>
<td></td>
</tr>
<tr>
<td>Not Enough Drill Material</td>
<td>7</td>
</tr>
<tr>
<td>Problems Too Complicated</td>
<td>7</td>
</tr>
<tr>
<td>Not Enough Word Problems</td>
<td>4</td>
</tr>
<tr>
<td>Too Similar to Seventh and Eighth Grade Arithmetic</td>
<td>4</td>
</tr>
<tr>
<td>Problems Too Easy</td>
<td>2</td>
</tr>
<tr>
<td>Algebra and Geometry</td>
<td>1</td>
</tr>
<tr>
<td>Are Overemphasized</td>
<td></td>
</tr>
<tr>
<td>Explanations Too Long</td>
<td>1</td>
</tr>
<tr>
<td>Insufficient Good Examples</td>
<td>1</td>
</tr>
</tbody>
</table>

The major difficulties according to those responding could probably be summarized by stating that most teachers of general mathematics find the content of general mathematics texts not entirely suitable for meeting the needs of the students. The comment on one questionnaire stated, "The trouble with the general mathematics texts is that every author and every publisher has his own idea as to what should be included, and all we get is a disorganized mess."

The variety of texts and the comments stated would indicate that many differences could be found in the course content in different schools. A specific course of study is not available on a statewide basis for the general mathematics classes in the secondary schools of Wyoming.

In answer to the question, "Is a specific course of study
used in the general mathematics course?" forty-nine replied
"no" and six replied "yes". Only about one tenth of the
replies stated a specific course of study was being used
in the general mathematics classes. The courses of study
in use were prepared by the following:

1. Head of the Mathematics Department
2. General Mathematics Teacher
3. The Textbook Author
4. The University of Wyoming
5. Mathematics Teachers of the System Working
   Together (two replies)

In comparing the flexibility of the general math-
ematics course with other mathematics courses, almost
unanimous results were obtained in answer to the question,
"How does the flexibility of the general mathematics course
compare with that of the other mathematics courses?" All
of the schools replying, except one, indicated the general
mathematics course was more flexible or that the general
mathematics course was adjusted to meet the needs of each
individual class. Several replies summarized the reason
for this greater flexibility by pointing out the wider range
of student ability between students in general mathematics,
as compared to the range of student ability in the other
mathematics courses.

These differences seem to carry over into the grad-
ing of students. Less than one third of the schools stated
that no special considerations in grading were given to the
general mathematics students. The other schools indicated
there were some differences between the grading in general
mathematics and other mathematics courses. Table XI summarizes these responses.

**TABLE XI**

**A COMPARISON OF THE GRADING IN THE GENERAL MATHEMATICS COURSES WITH THE GRADING IN THE OTHER MATHEMATICS COURSES OFFERED BY WYOMING SECONDARY SCHOOLS**

<table>
<thead>
<tr>
<th>Statement of Comparison</th>
<th>Type of High School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class I</td>
</tr>
<tr>
<td>Tends to be more lenient</td>
<td>15</td>
</tr>
<tr>
<td>No special consideration given in grading</td>
<td>12</td>
</tr>
<tr>
<td>Places more emphasis on individual ability</td>
<td>9</td>
</tr>
<tr>
<td>Places more emphasis on learning certain prescribed material</td>
<td>1</td>
</tr>
<tr>
<td>Tends to be more rigid</td>
<td>1</td>
</tr>
</tbody>
</table>

General mathematics seems to cover a wide variety of subject matter areas. A wide range of student ability is often found in the classes. In general, the courses seem to lend themselves quite well to the use of resources other than the textbook. Thirteen resources were listed on the questionnaire and provision made for indicating to what degree each one was used in the general mathematics classes. The responses received seem to indicate that outside speakers and field trips are used very little in the general mathematics classes. Movies, strip film, or slides were used to a certain degree in the general mathematics classes of about two dozen schools. The resources in Table XII
were arranged in an order determined by combining the responses for "frequently used" and "occasionally used."

### TABLE XII

**SUMMARY OF THE USE MADE OF THIRTEEN RESOURCES IN THE GENERAL MATHEMATICS CLASSES OF THE SECONDARY SCHOOLS OF WYOMING**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protractors, compasses, etc.</td>
<td>27</td>
<td>22</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Budgets, time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tables, etc.</td>
<td>11</td>
<td>27</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Reference texts</td>
<td>15</td>
<td>21</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Models of solids, etc.</td>
<td>10</td>
<td>26</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Bulletin board</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>materials</td>
<td>9</td>
<td>22</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Squared blackboard</td>
<td>11</td>
<td>13</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Movies</td>
<td>2</td>
<td>12</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>Strip film or slides</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Display cases or exhibits</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Spherical blackboard</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>Calculating machines</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside speakers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field trips</td>
<td>1</td>
<td>11</td>
<td>11</td>
<td>26</td>
</tr>
</tbody>
</table>

Many educators seem to agree that good textbooks and numerous other classroom materials help to improve any course, but in the final analysis the teacher is of prime importance. An effort was made to find out something about the teachers of general mathematics in the Wyoming secondary schools.

Sixty-eight schools reported that a total of 121 teachers were teaching at least one mathematics course.

Sixty-three of these teachers were teaching a course in general mathematics. All except two of the teachers of
general mathematics had a college degree, and 15.9 per cent of the degrees were masters degrees. From the standpoint of degrees, the general mathematics teachers of Wyoming seem to be well qualified.

The major fields of study of the teachers who reported teaching at least one course in general mathematics are given in Table XIII.

### TABLE XIII

<table>
<thead>
<tr>
<th>Major Field of Study</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>29</td>
</tr>
<tr>
<td>Science</td>
<td>7</td>
</tr>
<tr>
<td>Physical Education</td>
<td>6</td>
</tr>
<tr>
<td>Social Studies</td>
<td>5</td>
</tr>
<tr>
<td>Commercial</td>
<td>5</td>
</tr>
<tr>
<td>Education</td>
<td>2</td>
</tr>
<tr>
<td>Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Industrial Arts</td>
<td>1</td>
</tr>
<tr>
<td>History</td>
<td>1</td>
</tr>
<tr>
<td>Not Given</td>
<td>5</td>
</tr>
</tbody>
</table>

Less than one half of the general mathematics teachers indicated their major field of study was mathematics. About one sixth of the general mathematics teachers indicated their major field to be in an area closely related to mathematics. On the other hand, nineteen of those responding have their major field of study in some area which is not mathematics or a closely allied field. From comments received from some of the smaller schools general mathematics must sometimes be taught by a teacher not fully
qualified to teach mathematics. The other courses being taught by teachers of general mathematics and the other major responsibilities of the general mathematics teachers are given in Table XIV.

**TABLE XIV**

COURSES BEING, TAUGHT, IN ADDITION TO GENERAL MATHEMATICS, AND OTHER MAJOR RESPONSIBILITIES OF SIXTY-THREE GENERAL MATHEMATICS TEACHERS IN WYOMING

<table>
<thead>
<tr>
<th>Other Courses Taught or Other Major Responsibility</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Courses Only</td>
<td>19</td>
</tr>
<tr>
<td>Physical Education or Coach</td>
<td>11</td>
</tr>
<tr>
<td>Mathematics and Science Combined</td>
<td>8</td>
</tr>
<tr>
<td>Superintendent or Principal</td>
<td>8</td>
</tr>
<tr>
<td>Science Courses</td>
<td>5</td>
</tr>
<tr>
<td>Shop Courses</td>
<td>3</td>
</tr>
<tr>
<td>Commercial Courses</td>
<td>3</td>
</tr>
<tr>
<td>Audio Visual Coordinator</td>
<td>2</td>
</tr>
<tr>
<td>Other Courses</td>
<td>4</td>
</tr>
</tbody>
</table>

About one half of the teachers of general mathematics are either teaching courses which are not closely related to mathematics or have major responsibilities other than teaching. Approximately one third of the general mathematics teachers teach only mathematics courses. About one third of the general mathematics teachers are involved with physical education, coaching, or administration.
CHAPTER V

SUMMARY OF THE STUDY

This study was conducted for the purpose of obtaining information about the common practices in general mathematics in the secondary schools of Wyoming. This survey included only the common practices that existed in the general mathematics courses of the high schools and three-year junior high schools. No attempt was made to include courses offered below the ninth grade. The information presented was designed to give an overview of general mathematics in the secondary schools of Wyoming.

The questionnaire method of research was used; and the replies were carefully analyzed, tabulated, and reported as briefly and clearly as possible with the aid of numerous tables. A general overview of some other studies in the field of general mathematics was presented in Chapter II.

For convenience of the reader the major points of this study are summarized here:

1. The mathematics curriculum of most Wyoming schools seems to follow a traditional pattern of courses along with the addition of general mathematics in the ninth year in about one half of the schools. When only general mathematics or algebra are given in the ninth year algebra is given the preference.

2. All the secondary schools of Wyoming require at least one year of mathematics for graduation, and about one third of them require two years.

-30-
3. General mathematics is generally offered for ninth year students. Less than five per cent of the schools offer two successive years of general mathematics.

4. When students other than ninth-graders take general mathematics the reason is usually due to the student having failed some high school mathematics previously.

5. General mathematics in Wyoming schools is offered primarily for the student weak in mathematics. The better students are usually encouraged to take algebra instead of general mathematics.

6. The student's desire and the student's academic record are the two most often used factors for selecting the students that take algebra. Very little use is made of tests such as the Iowa Algebra Aptitude test in the Wyoming schools.

7. The principal and the student's eighth-grade teacher are the two persons that most often aid the student with registration.

8. There is very little agreement among teachers as to what texts should be used in general mathematics courses. Specific courses of study are seldom used, and considerable flexibility is evident in the general mathematics courses of Wyoming. Grading is generally more lenient in the general mathematics classes than in other mathematics classes.

9. General mathematics teachers make use of some common outside resources in their classes. Projected aids are used by a number of teachers, but outside speakers and field trips are almost wholly neglected.

10. From the standpoint of number of degrees the general mathematics teachers of Wyoming are well qualified. However, almost one third of them have their major field of study in an area not closely related to mathematics.

11. Approximately one half of the teachers of general mathematics either teach other courses which are not closely related to mathematics or they have major responsibilities other than teaching. About one third of the teachers of general mathematics are involved with physical education, coaching or administration.
On the basis of the findings of this study there seem to be several areas where further study is needed in order to modify and improve the existing situation in some of the schools. Some of the weakness that seem to exist in some general mathematics courses in Wyoming might be partially remedied by:

1. A study regarding the desirability of offering two years of general mathematics, in addition to the usual sequence of traditional courses, in more Wyoming secondary schools.

2. A study to determine the causes of failure in high school mathematics with the aim of suggesting methods of reducing the number of students who must take general mathematics after having previously failed some mathematics course.

3. A study of the existing procedures used in selecting students for general mathematics and algebra with the aim of improving the methods currently being used.

4. A study of the content, textbooks, and resources materials of the general mathematics courses in Wyoming schools with the aim of preparing a course of study which would meet the needs of most of the general mathematics students in Wyoming.

5. A study of the preparation of general mathematics teachers with the aim of improving the qualifications of the teachers of the general mathematics courses in Wyoming.
BIBLIOGRAPHY


LIST OF THE TWENTY-NINE TEXTBOOKS WHICH WERE BEING USED IN THE GENERAL MATHEMATICS CLASSES OF FORTY-NINE SECONDARY SCHOOLS IN WYOMING


Brueckner, Leo J. Arithmetic We Use, Chicago: Winston Company, 1944.


-36-


*Consumer Mathematics*, (no other information given).
Dear Mathematics Teacher:

Under the sponsorship of Dr. James E. Short, Professor of Education, Montana State University, I am making a study of general mathematics as it is taught in Wyoming schools.

As a fellow mathematics teacher you know there are many problems in general mathematics that have not been solved. In fact there are many things we do not even know about general mathematics as it is taught in our own state.

This questionnaire is being sent to the high schools and junior high schools in Wyoming. It is hoped that as you go through the questions you will recognize many familiar items and be able to tie them in with your own situation. Perhaps many of the questions will make you realize that some of your own problems are also those of other teachers throughout the state.

I feel many other teachers will be sincerely interested in the outcomes of this study. In fact a summary or report of some kind on this study will be made available if enough teachers indicate their desire for this information at the end of the questionnaire.

Individuals will not be indentified in this study so feel free to answer in any manner you wish. You are encouraged to use the back of the questionnaire for comments on any topic.

I feel certain that you are interested in improving your mathematics program and will be willing to devote the next five or ten minutes toward helping a study which could well supply much valuable information to the mathematics teachers of Wyoming.

Thank you very much for your help.

Sincerely,

Charles W. Popovich
Mathematics Teacher
Sheridan High School
Dear Principal:

About three or four weeks ago the enclosed questionnaire was mailed to all the high schools and junior high schools in Wyoming. The results of the questionnaire have been very gratifying thus far.

To date the return has been 45 per cent, and this second copy is being sent out in order to improve the validity of the survey. Many of the returns have been very revealing thus far and it is hoped that a few more returns will make the results sufficiently valid so that a summary or report of the survey can be made. If you feel such a summary would prove valuable please check in the blank provided at the end of the questionnaire.

Since the first questionnaire may not have reached the proper person please hand this one to an interested teacher of mathematics or take the next few minutes to answer whatever questions may apply and return in the enclosed envelope.

Thank you very much for your assistance.

Sincerely,

Charles W. Popovich
Mathematics Teacher
Sheridan High School
GENERAL MATHEMATICS QUESTIONNAIRE

What is the approximate school enrollment?

How many teachers are teaching at least one mathematics course?

How many of these are teaching a course in general math?

Is a specific course of study used in the general math course? ______ If answer is "yes" who prepared it?

How does the grading in general math compare with that in other math courses?
   ______ Tends to be more lenient
   ______ Tends to be more rigid
   ______ Places more emphasis on individual abilities
   ______ Places more emphasis on learning prescribed material
   ______ No special consideration given in grading general math students
   ______ Other (specify)

What basic text(s) are used in the general math classes?

<table>
<thead>
<tr>
<th>TITLE</th>
<th>AUTHOR</th>
<th>PUBLISHER</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
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<td>2.</td>
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</table>

In your opinion has any one text been entirely satisfactory in meeting the needs of the general math students? (Specify)

If you answered "no" to the above question, please specify what you think are the major shortcomings of the general math texts?

How does the flexibility of the general math course compare with that of the other math courses?
   ______ More flexible than others
   ______ Less flexible than others
   ______ Adheres closely to a prescribed curriculum
   ______ Adjusted to meet the needs of each individual class
   ______ Other (comment)

In your opinion has the method of enrolling and selecting general math students been entirely satisfactory? (Comments Please)
Check the resources that are utilized to aid in meeting the needs of the students enrolled in general math and indicate to what degree used.

RESOURCE FREQUENTLY OCCASIONALLY SOMETIMES NEVER USED

Other reference texts
Field trips
Outside speakers
Strip film or slides
Movies
Squared blackboards
Spherical blackboard
Bulletin Board materials
Calculating machines
Exhibit or display cases
Models of solids etc.
Time tables, budgets, etc.
Compasses, protractors, etc.
Other (specify)

Check the major reason(s) why students other than ninth graders take general math.

___ Failed general math before
___ Failed algebra I
___ Scheduling difficulty in ninth year
___ Took algebra I in the ninth year
___ Taken to meet graduation requirement not previously fulfilled
___ Student chose to take general math other year than the ninth
___ Other (specify)

How many NINTH year students now enrolled in general math are NOT ninth year students?

Approximately what percent of the original enrollment in general math ordinarily receive failing grades the first semester? the second semester? both semesters?

Are the better students usually encouraged to take algebra instead of general math? (Comment)

What math courses must a student take in order to graduate?

Do you feel the general math course is primarily a terminal course for the student weak in math? (Comment)

How many of the students now enrolled in general math are NOT ninth year students?
Which of the factors listed below are used to determine who takes general math and who takes algebra?

- I. Q.
- Reading Grade Placement
- Arithmetic Grade Placement
- Mental Age (M.A.)
- Students desire
- Student's academic record
- Statement from previous teachers
- Algebra Aptitude Test
- Other (explain)

If tests such as the algebra aptitude test are used, please indicate which ones, and if possible give the scores which are generally used as criteria to aid in grouping the students into general math or algebra I.

NAME OF TEST USED                      SCORES USED AS CRITERIA, IF ANY
1. _______________________________________
2. _______________________________________

Which person(s) generally aids the most in determining in what course the students enroll? (explain briefly if unusual)

- General math teacher
- Homeroom teacher
- Eighth-grade teacher
- Ninth-grade teacher
- Counselor
- Principal
- Registrar
- Student's Advisor
- Student's parents
- A combination of some of these in conference (specify)
- Other (comment)

Indicate below the year in which each course is offered in the USUAL sequence. If not offered EACH year as regular course specify how often.

<table>
<thead>
<tr>
<th>COURSE NAME</th>
<th>NOT BEING OFFERED AT PRESENT</th>
<th>IN WHAT YEAR DO STUDENTS USUALLY TAKE THIS COURSE?</th>
<th>9th</th>
<th>10th</th>
<th>11th</th>
<th>12th</th>
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<tbody>
<tr>
<td>Algebra I</td>
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<td>Algebra II</td>
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<td>Plane Geo.</td>
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<td>Solid Geo.</td>
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<td>Gen. Math I</td>
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<td>Gen. Math II</td>
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<td>Business Math</td>
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<td>Shop Math</td>
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<td>Senior Math</td>
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<tr>
<td>Others</td>
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</table>
Indicate the combination of courses taught by teachers of general math classes and list any special duties they may have in addition; such as superintendent, principal, coach, etc.

<table>
<thead>
<tr>
<th>TEACHER #1</th>
<th>TEACHER #2</th>
<th>TEACHER #3</th>
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</thead>
</table>

Indicate the amount of training and experience each teacher of general math has had.

<table>
<thead>
<tr>
<th>TEACHER #1</th>
<th>TEACHER #2</th>
<th>TEACHER #3</th>
</tr>
</thead>
</table>

Number of years of college preparation

Degrees held if any

Major field of study

Total years of teaching experience

---

(Name of Your School)  
(Name and Title of Person filling out this Questionnaire)

Check here if you feel a summary of this study would be of value to you in your work. ________