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Educational specifications for a junior-senior high school building for North Smithfield, Rhode Island

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EDUCATIONAL SPECIFICATIONS FOR A JUNIOR-SENIOR HIGH SCHOOL BUILDING FOR NORTH SMITHFIELD, RHODE ISLAND

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THE PROBLEM

The purpose of this study is to determine the educational specifications for a six year junior-senior high school building most suitable to the needs of the town of North Smithfield, Rhode Island, to be approved by the Board of Education for use by the architect in preparing preliminary and final plans for the building.

The writer was prompted to undertake this study because of his responsibility as Superintendent of Schools to provide his School Board with suitable educational, building and equipment specifications necessary for the construction of a junior-senior high-school building, in the light of recommendations made by Engelhardt, Engelhardt and Leggett, Educational Consultants in their "Survey of North Smithfield School Buildings," made in 1949; his own observations and conversations with the youth of the community; and the need for planning on a long-term basis.

Engelhardt, Engelhardt and Leggett had the following to say in their survey report:

"North Smithfield has not met its responsibilities in providing

suitable secondary education for all youths."[1]

"No building provides adequate educational facilities beyond grade 6.

"The drop-out rate (55 per cent) from grade 7 to 12 indicates the need for an improved secondary school program."[2]

"North Smithfield could support its own secondary school for grades 7-12."[3]

"It is, therefore, suggested that North Smithfield organize its system on a K-6-6 basis. If North Smithfield decides to build its own high school, it should be designed initially for 400 pupils with the possibility of enlargement to twice that capacity. The site should be at least 50 acres in area. The curriculum should provide for a comprehensive program including general education, college preparatory and vocational studies."[4]

The following facts add emphasis to the need for this study: (1) the apparent lack of preparation for a vocation by present students especially among the non-academic students; (2) the present high cost of tuitions and transportation of our pupils to high schools in other communities.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, "School Building Survey of North Smithfield, Rhode Island," Educational Consultants, Riverdale, New York City, N. Y., 1949, p. 35.

2/Ibid., p. 32.

3/Ibid., p. 33.

4/Ibid., p. 35.

A study for this purpose should be conducted on a long-term basis to take care of future needs as well as present. Engelhardt, Engelhardt and Leggett[1/] have emphasized this point in a recent statement that, "The planning of a high-school building is a longtime process. Sound school administration stimulates study of the educational need long before the building project becomes imminent."

The procedure in this study has been to develop an appropriate educational program and then to set up the building and equipment specifications based upon this program.

The educational program has been based upon the common and individual needs of the adolescents of North Smithfield and certain principles to be stated in the program.

There is a statement and discussion of each of the imperative needs of our adolescents. The functions of both junior and senior high school education will be clearly defined and the needs of North Smithfield described.

The program lists required and elective subjects with the objectives of each subject. Evidence is presented to show how the required and elective subjects will meet the interests, needs and abilities of our students.

Provisions have been made for the inclusion of adequate pupil guidance to aid in personal and social development, in making

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1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, Rheinhold Publishing Corporation, New York City, N. Y., 1949, p. 25.

adjustments within and outside of the classroom, and the selection of vocational objectives and subjects to be studied in preparation for them. The place of audio-visual education and extra-curricular activities in the program has been considered.

In developing this program, a study has been made of (1) the Consultants' Report; (2) the needs of our adolescents; (3) ways of enriching the small high-school curriculum; (4) the writer's observations and conversations with the youth of the community; (5) school census figures for the town; (6) and recommendations of educational and school-building authorities.

The building and equipment specifications have been planned to adequately house the proposed educational program. Thought has been given to the problem of number, size, as well as multiple use of classrooms. It has been necessary to determine : (1) the program of studies; (2) the location of rooms; (3) style of the building; (4) probable enrollment per subject; (5) the desired average size class per subject; (6) maximum pupil capacity per room; (7) the number of rooms per subject; and (8) the approximate dimensions in feet or area in square feet of each room.

Consideration has been given to such details as chalkboards, use of projectors, storage, acoustics, and teacher requirements.

Special rooms, such as the laboratory, shop, and home economics room will be designed to meet their specific purposes.

The American Association of School Administrators regard the

following information as necessary in planning school buildings.[1]

1. The number of pupils to be served
2. The grades and ages of children to be accommodated
3. The number of classrooms, laboratories and shops needed to carry out the planned program
4. Size of each type of room
5. Pupil capacity of each room
6. Standard and special plumbing, electric and storage facilities required in each type of classroom, laboratory and shop
7. Auditorium capacity desired
8. Gymnasium size and seating capacity
9. Library and study facilities and the number of pupils to be accommodated therein
10. Lunchroom capacity desired
11. Community uses of auditorium, gymnasium, library and lunchroom; also other community facilities needed
12. Method of student clothing storage
13. Type of furniture to be used in classrooms
14. Number of volumes to adequately staff the library
15. Extra-curricular facilities other than gymnasium and auditorium

It will be the writer's task to make as much of this information available as is necessary to help the architect prepare his preliminary plans.

1/American Association of School Administrators, American School Buildings, Twenty-seventh Yearbook, 1949, National Education Association, Washington, D. C., p. 349.

Present, past and probable future enrollments will be studied carefully to determine the present building and equipment needs and the possibilities of expansion in the future.

Data procured from the literature of educational authorities, Engelhardt, Engelhardt and Leggett's Survey Report and the writer's observations will be presented and referred to whenever necessary.

It is assumed that the recommendations of well-known educational authorities referred to in this study are basically sound and that all statistics found in the tables of the Consultants' Report are correct.

From this study it is hoped that a junior-senior high-school building most suitable to the needs of the community will become a reality.

CHAPTER II

A PROPOSED EDUCATIONAL PROGRAM

The Educational program proposed will be based upon certain basic principles, the common needs of all youth and the individual needs of the youth of North Smithfield as noted by the writer in his observations, and from conversations with the youth of the town.

1. Basic Principles

The following principles derived from the writer's study of the literature in the field appear to the writer to be basic requirements of the educational program:

1. This town should offer a well-balanced educational program based upon the needs of adolescents.
2. This town should have a secondary school, so that its pupils will be retained in school until graduation.
3. This school should teach the meaning of democracy by operating democratically to insure better citizenship.
4. This secondary school should be useful to the whole community, for community improvement, education and recreation.

This program is well described in the following statement of the cardinal principles of education:[1/]

1/United States Department of Interior, Bureau of Education, Cardinal Principles of Secondary Education, Bulletin, 1918, Number 35, Washington, D. C., 1918.

"It must meet the needs of all our youth by providing adequate training in citizenship, health, worthy home living, vocations, ethical character, command of fundamentals, and worthy use of leisure time."

2. Common Needs of All Youth

The Educational Policies Commission, made up of members of the American Association of School Administrators, has made a significant contribution toward the improvement of policies and practices in the secondary schools of America through its publication, "Education for All American Youth."[1/]

This publication was regarded so highly by the National Association of Secondary School Principals that its members had a summary of it prepared to emphasize the need for planning for the welfare of youth now. They called it, "Planning for American Youth."[2/]

"Education for All American Youth" proposes two educational programs, one for the mythical town of Farmville, which can be any rural community of America like North Smithfield, and the other for the mythical city of American City, meaning any American city like Providence.

The Farmville program has been helpful in this study. It is planned to meet ten imperative needs of youth. They also serve as one of the requirements of the program proposed for North Smithfield.

Farmville is rural America. It is not rich, nor is it poor. It is made up of hard-working American citizens who are interested in

1/Educational Policies Commission, Education for All American Youth, National Education Association, Washington, D. C., 1944.

2/National Association of Secondary School Principals, Planning for American Youth, National Education Association, Washington, D. C., 1944.

having good farms, good business, good churches, a good government and good schools.

Its secondary school includes grades 7 through 14, and its educational program is suited to boys and girls 12 to 20 years of age. This program is continuously changing with the changing needs and interests of maturing youth and is flexible to permit adaptation to students who differ somewhat from the average.

In grades 7, 8 and 9 the curriculum is the same for all pupils, since their educational needs in early adolescence are common. Individual differences of pupils are taken into account by the teachers who also act as guidance counselors.

In grades 10 through 14 the curriculum is differentiated to suit the needs of individual maturing adolescents. Each student aided by his counselor plans an educational program consistent with his purposes and capacities.

Upon entering the tenth grade in Farmville's high school, the counselor plans for students to begin immediately making educational and vocational plans. Each student is provided opportunity to study the "World at Work," a series of exploratory experiences through which he becomes acquainted with the labor of farmers, workers in factories and transportation, clerks, managers, homemakers, physicians, engineers, teachers, public officials, mechanics, carpenters and others. The pupil is given opportunity to study our economic system, to appreciate the necessity of labor in human society, to get acquainted with his own community, and the occupations and jobs available there.

Each counselor studies the pupil's aptitudes, interests, and attempts to discover his capacities and to awaken interests. Each student works out his educational program through the twelfth grade under guidance.

The eleventh and twelfth grades are spent in preparing students for their life work or if they have not made a choice, then they continue to search for one. Some do not make a choice until 17 or 18 years of age.

To aid youths in carrying out their plans they are recognized as three groups: those who will stay in Farmville; those who will go to a city to live; and those who will go to a college or university. Each group is provided with specific experiences to meet his future needs.

Grades 13 and 14 are provided for pupils who will stay in Farmville; others are advised to leave school at this point.

Farmville's secondary educational program, as a whole, is designed to: (1) educate for citizenship; (2) provide intelligent action as well as knowledge in the essentials of democratic living; (3) prepare youth for worthy home living; (4) prepare youth for an occupation; (5) provide work experiences under actual productive conditions; (6) train its youth to be healthy; (7) provide leisure-time activities; and (8) serve the whole community through its school facilities.

North Smithfield needs a secondary school with an educational program similar to Farmville's. Like Farmville, North Smithfield's

program should also meet the ten imperative needs of youth [1] named by the Educational Policies Commission.

A statement and discussion of each of these ten imperative needs follows, indicating the subjects and activities which should be required in North Smithfield to meet them.

On the basis of this discussion, an educational program will be prepared for North Smithfield.

3. The Ten Imperative Needs of Youth

Need 1.-- Youth need to develop salable skills and those understandings and attitudes that make the worker an intelligent and productive participant in economic life. To this end most youth need supervised work experience, as well as education in the skills and knowledge of their occupations.

Our youth must acquire knowledge and skills that will enable them to make a successful beginning in business or industry, or in further education, or both. To do this, the assistance of a guidance counselor will be needed. He will help to answer such questions as:

1. What occupations shall I enter? 2. What courses shall I take?
3. Shall I go to the city to work? 4. Should I go to college?

In helping our youth to answer these questions, the counselor should consult with their parents, make arrangements to provide work experience for them and keep follow-up records of them even after they leave school. These records should show wherein the youth were well

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1/Educational Policies Commission, Education for All American Youth, National Education Association, Washington, D. C., 1944.

prepared and wherein they were found lacking. Such records measure the success of the school's program and serve as a means for improving it.

To meet this vocational need, it will be necessary for the counselor to determine and to make adequate provisions in the educational program for:

1. Those who will stay in North Smithfield

2. Those who will go to cities upon completion of high school

3. Those who will go to college, universities, etc., in further preparation for a vocation

4. Those who will go into the Armed Services

Students in each of the preceding groups must have opportunities to develop their personal interests and abilities in addition to skills to determine the vocation for which they are most suited. They must be encouraged to develop industrious work habits, and a willingness to cooperate and assume responsibilities. They must be provided good personal and occupational counseling, and each pupil must be given a chance to become acquainted with the different occupations. Each pupil must learn to appraise his own abilities in relation to the available occupations.

Opportunity should be provided for pupils to engage in work experience at home and in local shops or places of business. Such a work experience program could be administered more effectively by a secondary school located within the town.

Vocational experience of a preparatory nature should be offered to those who will stay in town, in the field of textile manufacturing,

business training, mechanics and agriculture. There are definite possibilities in agriculture, especially for those who live on farms. However, the writer does not believe that enough students will be interested to offer a course in agriculture.

"Education for All American Youth"[1/] recommends such activities in school as repairing machinery, keeping accounts, keeping cafeteria accounts, planning a home, family budgeting, home decorating, gardening, food preservation, securing loans and insurance as worth-while projects for those who will stay in the town.

For those who will go to a city, a special study of problems of city life, its occupations and the qualifications necessary for city positions should be offered. Business and governmental authorities from cities can do much to help prepare these pupils by being invited to the classroom to discuss the problems of city life.

Those who plan to attend a college or university for vocational preparation will be required to take subjects that meet the requirements for entrance to the different colleges and universities. Each student with the assistance of the guidance counselor will plan his program of studies for college entrance. His plan should include work in science, mathematics, social studies, English, foreign languages and opportunities to observe workers in the profession or occupation he plans to enter.

In addition, these students should receive adequate counseling on schools to attend, personal problems while living away from home,

1/Educational Policies Commission, Education for All American Youth, National Education Association, Washington, D. C., 1944.

training for the professions, and personal abilities. It is important that attention be given to the place of a chosen profession in rural community life.

And for those who will go into the Armed Services, C. E. Andrychowski [1] says in a study involving this problem:

> "The Army and Navy have requested, through their Pre-Induction Training plan that emphasis be given to: (1) physical fitness; (2) mathematical skills; (3) knowledge of and ability to apply scientific principles; (4) basic language skills; (5) occupational skills; (6) knowledge of why we fight; (7) orientation to life in the Services; (8) health, sanitation and first aid; (9) map-reading ability.
>
> Each subject taught can be related to one or more of these objectives. By rearrangement more time can be given to those parts of a course that will help prepare the boys and girls for the immediate demands of war. Physical development, skill in science, mathematics and a better working knowledge of English, languages, history and geography are all the requisites of the well-trained soldier."

Based on the above the writer recommends that the following subjects should be provided for North Smithfield secondary school pupils to choose from to meet their vocational needs.

1. industrial arts
2. home economics
3. general science
4. biology
5. chemistry
6. physics
7. guidance
8. typewriting
9. stenography
10. bookkeeping
11. algebra
12. plane and solid geometry
13. trigonometry

1/C. E. Andrychowski, The Program of Studies and the Program of Extra-curricular Activities in a Small Secondary School System, Unpublished Master's Service Paper, Boston University, Boston, Massachusetts, 1946, pp. 48-49.

The writer recommends that students who will remain at home need to study:

1. English
2. industrial arts
3. home economics
4. mathematics
5. general science
6. guidance
7. typewriting
8. stenography
9. bookkeeping

The writer recommends that those who will go to a city need to study:

1. English
2. industrial arts
3. home economics
4. mathematics
5. typewriting
6. stenography
7. bookkeeping
8. general science
9. guidance
10. problems of democracy

The writer recommends that those who will go to a college or university need to study:

1. English
2. guidance
3. algebra
4. plane and solid geometry
5. trigonometry
6. biology
7. chemistry
8. physics
9. foreign languages
10. world history
11. United States history and government

The writer recommends that those who will enter the Armed Services need to study:

1. English
6. chemistry

2. industrial arts
3. mathematics
4. general science
5. biology
7. physics
8. foreign languages
9. guidance
10. United States history and government

Need 2: All youth need to develop and maintain good health and physical fitness.

We must have in our secondary school program provisions for the physical development of our youth if they are to meet the second imperative need of all youth.

From the time a pupil first enters school in North Smithfield, he is given repeated physical examinations. Dental, hearing and sight tests are also given to all pupils. Knowing the results of these examinations every effort is made to correct noticeable defects and to improve situations aggravating the defects. The aid of parents, teachers, school physician and school nurse is sought on a co-operative basis.

The recommended program of the proposed secondary school includes: (1) physical examinations; (2) instruction providing students with certain knowledge; (3) physical exercises with opportunities for students to play games; and (4) the development of proper habits and attitudes.

The physical examination should give definite attention to the general structure of the body, heart, lungs, skin, physical defects and irregularities. Eye, ear, dental and chest examinations should be given by qualified persons. Careful follow-up of these examinations should take place just as in the elementary school. Parents

should be consulted and advised. There should be a school nurse on full time duty to administer to the needs of adolescents, to teach health courses and to check and advise students. She should have adequate facilities, and be a person in whom all students and parents have complete confidence.

Students should be instructed in such matters as proper care of the body, first aid, nutrition, rest and exercise. Practice, as well as the theory of personal cleanliness, should be emphasized. Provisions for taking showers in clean, well-ventilated and safe shower rooms should be made.

The State Department of Education of Rhode Island has issued the following regulation relative to health instruction and physical education in the public schools of the State. It is as follows:

> "It shall be the duty of the School Committee to provide a program for supervised physical education and health instruction for all pupils in grades one through twelve for at least a twenty minute period daily or an average of one hundred minutes a week in addition to the regular recess. At least one fifth of the time shall be devoted to health instruction."1/

To develop physical fitness pupils must participate in the physical education program. It is defined by the State Department of Education of Rhode Island as:

"A method and program of education which shall be construed to cover all forms of non-vocational physical activities both intramural and interscholastic."2/

1/State Department of Education of Rhode Island, Regulations of the State Department of Education Concerning Health and Physical Education. State Department of Education, Providence, Rhode Island, 1950, p. 2.

2/Ibid., p. 3.

The extent to which a pupil participates in physical education thus defined should depend upon his physical condition.

In order to provide an adequate physical education program, a gymnasium to accommodate all pupils and suitable out-of-door play areas should be provided.

There should be regular conditioning exercises, tumbling exercises, wrestling, basketball and indoor baseball to be enjoyed in the gymnasium. For out-of-door activities, there should be intramural and interschool sports consisting of football, baseball, ice hockey, field hockey, track, softball, volleyball and basketball.

Other subjects can make contributions toward helping our youth to develop and maintain good health and physical fitness. Home economics can teach about nutrition, home hygiene about the care of the sick, general science, biology and chemistry classes can show how science has advanced man's ability to prevent and cure disease, and to create a healthful environment. Health and safety education can be stressed in industrial arts and home economics classes.

The recommended subjects that our youth in all four groups (i. e. Those who will stay in North Smithfield after completion of high school, etc.) should study if they are going to develop and maintain good health and physical fitness are:

1. health
2. physical education
3. guidance
4. home economics
5. general science
6. biology
7. chemistry

Safety education will be included under health instruction and home hygiene under home economics.

Need 3: All youth need to understand the rights and duties of the citizens of a democratic society and to be diligent and competent in the performance of their obligations as members of the community and citizens of the state and nation.

The third imperative need stresses the necessity of having a thorough understanding of the rights and the duties of a citizen and the need for diligence and competence in the performance of the duties of a citizen.

North Smithfield students should learn the full meaning of freedom in a democracy. They should learn that freedom is the result of individual and group action, and that it imposes responsibilities and requires personal character. Great importance should be placed upon the development of our youth as citizens. We should provide for all of our youth a real understanding of the meaning of democracy, and a knowledge of how to participate in civic affairs intelligently. Our educational program should provide for the personal development of each pupil by aiding him to develop character; intellectual achievement; understand and appreciate the rights of others; and how to maintain a decent home life.

North Smithfield should aid its youth in developing social skills to prepare them for effective living in the home, on the job and in the community. To attain these skills our schools should provide practice in democratic living through an educational program that

aims to develop recreational and leisure-time interests and activities.

If the educational program is to qualify our youth to take their places in society, then citizenship training must include living democratically both within and outside of school; participation in civic activities in the school and community; and an understanding of local, state, national and world affairs. To develop competence in meeting the obligations of solving local public problems requires a knowledge of what this community needs in the way of improvements, and how they can be brought about. A local high school could consider such problems most effectively.

Our students must learn to think clearly and be able to make sound judgments.

And finally each student should be inspired with a true spirit of loyalty to his duties as a citizen of a democratic society. This can be done by:

a. Providing actual experiences in democratic living.

b. Providing clear ideas about that to which our pupils should be loyal

c. Developing an appreciation in our youth of the cost of one's loyalty

d. Providing opportunity for our youth to work for the cause to which they are loyal.

Various subjects in the program can help our students to meet the need of understanding their rights and duties as citizens of a democratic society.

History classes can trace the history of American life, the ideals for which we stand, and what these ideals cost in human sacrifice. Civics and problems of democracy classes can acquaint our youth with their community--its government, economics and social life. Extra-curricular activities, such as student government, attending town council and civic organization meetings, provide opportunity for our students to gain first-hand experience in democratic living.

The recommended subjects that our students should be given to understand the rights and duties of the citizens of a democratic society and to be diligent and competent in meeting their obligations as a citizen are:

1. civics
2. world history
3. United States history and government
4. problems of democracy

All four groups of our students previously mentioned in this study need to study the above subjects.

Need 4: All youth need to understand the significance of the family for the individual and society and the conditions conducive to successful life.

This need of our youth is very important. It is being neglected by some secondary schools. Many of our own students, presently enrolled in twenty high schools located in practically as many towns and cities, appear to be receiving little or no training in the problems of family life, home making and home management.

North Smithfield's adolescents should be taught to understand the

real significance of family life, its importance to society in general, and the great personal happiness and joy attached to successful home life. Our pupils should possess a knowledge of how to live together with their families in a harmonious manner; how to plan for their economic security; how to care for their homes; and how to be intelligent consumers. In short, as future home makers, our pupils should be prepared to assume this role in society as members of families.

The State Department of Education, Columbus, Ohio, [1] in a tentative course of study issued in September, 1939, has named different types of problems that should be studied in conjunction with this particular need. These can well be the tenets of a course dealing in home and family living. Those named are: (1) personal problems of adolescents; (2) living at home which includes making friends and living with one's family; (3) making a home; (4) maintaining satisfactory individual, home and community relationships.

If North Smithfield is to assume its responsibility and provide each student with an adequate education, it must take steps to prepare its youth to meet their responsibilities as members of a home and as future homemakers of America. The present rate of deterioration of family life in the world is evidence of the fact that many individuals need to understand the significance of family life.

North Smithfield should include in its high-school curriculum a course on Home and Family Living. The course should be constructed to

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1/The State Department of Education, A Tentative Course of Study for Home Economics, (Issued in September, 1939) Columbus, Ohio.

assist students with successful personal living as members of homes and the community. It should provide knowledge dealing with the personal problems of adolescents; knowledge of how to live happily and successfully at home and in the community. There should be training in homemaking, home management, buying intelligently, and how to maintain satisfactory individual, home and community relationships.

To meet this family need, it will also be necessary for teachers to know the nature of the problems of their students' families, their housing conditions and home situations, the community influence affecting them, industrial conditions of the community, and cultural and racial influence.

A local high school should provide its faculty with opportunities to gain first-hand information relating to these problems.

The recommended subjects that our students should study to meet this family need are:

1. home and family living
2. social studies
3. industrial arts
4. general science
5. biology
6. chemistry
7. English
8. general business training
9. health
10. physical education
11. art
12. music

Need 5: All youth need to know how to purchase and use goods and services intelligently, understanding both values received by the consumer

and the economic consequences of their acts.

Individuals need to know how to become better buyers for this purpose. They need to learn the techniques of buying; the use of credit; budgeting; and how to detect frauds in selling. They need to become familiar with certain aids to consumers provided by the government and private corporations.

Our students should learn how our economy operates and how it affects human welfare. They ought to understand to a certain degree the problems involved in buying and selling. There is need for them to know the values of sales information and advertising; how to evaluate articles commonly purchased; and how to make investments. Each student ought to know something about the nation's international relations and their effects upon our economy. Each student should possess general information about the relationship of industry and government; about taxation and public finance.

Consumer education should be incorporated in the program of studies.

It is important, too, that our students know the results of their economic acts. Visits to banks, loan associations, department stores, advertisement agencies and the local tax collector's office should supplement classroom activities to show the results.

The writer recommends that the following subjects be studied by our students to show them how to buy and use goods and services intelligently and how to understand the values received and the economic consequences of their acts:

1. home economics involving consumer education
2. civics
3. problems of democracy
4. business education
5. mathematics

Need 6: All youth need to understand the methods of science, the influence of science on human life and the main scientific facts concerning the nature of the world and of man.

Science is one of the chief elements in our cultural heritage. Understanding scientific methods and the scientific point of view is a part of our cultural birthright. All students should develop an attitude of inquiry. This should be started in the elementary grades where simple experiments are performed. Science has caused great changes in the lives of men, and is man's most important instrument in making further progress. In thinking about science one is impressed with the importance of exact measurements and accurate calculations and the need for stressing the mathematical point of view as well as the cultural in teaching the course.

North Smithfield students should study science to familiarize themselves with definite fundamental principles and facts, which, when taken together, give them a sound view of the nature of the world in which they live.

The recommended subjects which will teach our students an understanding of the methods of science, the influence of science on human life and the main scientific facts concerning the nature of the world and of man are:

1. general science
2. biology
3. chemistry
4. physics

Need 7: All youth need opportunities to develop their capacity to appreciate beauty in literature, art, music and nature.

A development of the aesthetic appreciations is important in the education of all youth. To be able to understand and appreciate good music, art, literature and the beauty in nature is a quality that all of our youth ought to possess. Each is a medium that can provide enjoyment and relaxation throughout an individual's lifetime.

English classes should provide opportunity for our pupils to read and appreciate biographies, fiction, dramas and poetry. In addition, there should be opportunities to take part in plays and to attend plays.

Art should be taught for appreciation. Pupils should be given opportunities to draw, paint and sketch through which they may learn to appreciate the beauty in art and in nature. There should be visits to the art museum in Boston to further stimulate the students.

Our students should be aided in finding beauty in their everyday lives; in their homes; in pictures; and in nature.

The need for developing talent in art should be emphasized, as well as the appreciational point of view.

Music, likewise, should be taught for appreciation and for the development of talent. Students should listen to good music such as the Rhode Island Philharmonic Orchestra. This would not be difficult to arrange, since the services of the orchestra can be procured for school concerts at the expense of the State Department of Education. In addition, there should be opportunities for students to play in the school orchestra; and take part in pageants, singing musicales, folk-

dancing and dancing.

The school auditorium can be used by the school and the public for such purposes.

The recommended subjects and activities which will help our students to develop their capacity to appreciate beauty are: art, music, literature and extra-curricular activities, e. g. glee club, dramatics.

Need 8: All youth need to be able to use their leisure time well and to budget it wisely, balancing activities that yield satisfactions to the individuals with those that are socially useful.

North Smithfield's adolescents need to learn how to use their leisure time profitably through art, music, literature, nature study, the practical arts and avocations. It should be our duty to provide interests and activities for them and to help them discover their capacities for enjoyment of their interests. The program of studies should be organized to bring out all possibilities for hobbies.

Use should be made of the library, recreation room, gymnasium, craftshop, and clubs. Students should share in planning and promoting activities.

Avocational interests should be developed through sports, clubs, choral singing, playing in the orchestra, folk-dancing, dramatics, hobbies and other recreational activities.

Use should be made of the shop where students may use tools in developing satisfying avocations.

To meet this need our program should include art, music, literature, and extra-curricular activities, so that our students will learn

how to make good use of their leisure time.

Need 9: All youth need to develop respect for other persons, to grow in their ethical values and principles, and to be able to live and work co-operatively with others.

Our students must learn to understand and appreciate democracy as the American way of life. There is a great need to learn how to practice democracy; how to contribute to it through individual and co-operative action; and how to get all the advantages it has to offer. They must be concerned about the welfare of others, and develop worthy traits for worthy membership in home, school, church, community, state, nation and the world.

We should teach our students their rights and responsibilities and respect for fair play with reference to the rights and responsibilities of others. They must develop proper attitudes for leadership, and how not to be dominated by others. Also, every student must be taught to be law abiding.

All school activities in which students participate must be organized and conducted to give constant practice in the way of life just described.

Every activity should provide opportunity for student participation and sharing the results. All subjects studied must contribute to the building of concepts and skills, attitudes and ideals which all students should possess if they are to live effectively in a democracy and be intelligently concerned about their own welfare and the welfare of others.

The recommended studies which will help our students to develop respect for others, to grow in their ethical values and principles, and to live and work co-operatively with others are: guidance, civics, problems of democracy, literature and extra-curricular activities such as student government.

Need 10: All youth need to grow in their ability to think rationally, to express their thoughts clearly and to read and listen with understanding.

Our adolescents need to become effective and efficient in self-education if they are going to continue to grow mentally after they leave school.

Each student must achieve command of all fundamental skills involved in reading and self-expression, in listening, and ability to think for himself.

Students must be able to read, write, add, subtract, divide and multiply; and to read maps, charts, tables and graphs. They must learn how to use the library, reference books and the dictionary; and to apply arithmetic in the solution of everyday problems. All students must be taught to listen attentively and to think.

The writer believes that all subjects, local problems and extra-curricular activities can be made to contribute to meeting this need.

4. Special Individual Needs of the Youth of the Community

The following are observations on how a local junior-senior high school might meet the needs of the youth of this town as noted by the

writer as Superintendent of Schools and especially in his observations and conversations with them while issuing work certificates. Many of these young people left school upon reaching the age of sixteen without having completed their high-school training.

The establishment of a junior-senior high school educational program in North Smithfield would decrease the amount of time and the dangers involved in traveling to and from school each day. Some students travel 30 miles each day, and must leave their homes at seven o'clock in the morning in order to arrive at school on time. Frequently, it is five o'clock in the afternoon before they return home. Much time and energy are spent in traveling with the the result that students have little of each left for home study, play or work.

A junior-senior high school located in the town would provide a teaching personnel more likely to be acquainted with the individual needs of students. A close association with each student should make the teachers vitally interested and sympathetic to their needs. There would be greater opportunity for teachers to know more about their students, their families, their out-of-school activities, and the community.

There would be a strong incentive for students to want to attend their own school; since some complain of being "lost" or "left out" in other schools. They do not have the "school spirit" that their own school could make possible for them.

Athletics would provide an incentive for boys to want to remain in school. In the local junior-senior high school there would be time for such after-school activities.

There is need among our students for a sound guidance program both

while students are in school and after they leave. For the most part, our students receive little or no formal guidance while enrolled in secondary schools elsewhere. This is due to the lack of time and the absence of guidance programs in most of these schools. At present this community has no facilities for guiding its out-of-school youth. It would be especially good to have a guidance program in North Smithfield.

There is need for the teaching of home economics and industrial arts in grades 7 through 12. All present buildings in the town have no space for the teaching of either of these courses in the seventh and eighth grades. The result is that our students enter ninth grade in other communities without any preparation in home economics and industrial arts as others get. Many become discouraged and leave school. Home economics and industrial arts are especially valuable in the preparation of our youth who will remain in the town, or who will go to the city to live after leaving school.

Our secondary school should provide vocational guidance, shop training, and work experience on the job. There is need to discover pupil aptitudes and interests before they can be prepared for occupations. Also, definite training on "getting along on the job" should be given to prevent drifting from one job to another as is the case today with some of our young people. Such training should be provided by local people who are interested in our students, and are familiar with local conditions.

There is a great need for improving library facilities especially for students in North Smithfield. At present, there is no central

public library. Small public libraries are located in the elementary schools of the community. None have adequate space where a person may sit down and enjoy reading for pleasure. If an adequate library were built in the junior-senior high school, it might well become a public library.

There is no community building in North Smithfield where our youth may meet and enjoy sports, games, hobbies and club activities. A gymnasium for community use is needed.

A new junior-senior high school building could provide these facilities.

There is need for improvement of citizenship and civic responsibilities. Many citizens are quick to criticize our youth for their apparent lack of interest, zeal and ambition. Providing a new school for our youth is a civic responsibility of the citizens of the town. Our youth would appreciate it and their attitudes might improve.

A community makes certain demands of its citizens--that they vote; attend town meetings; respect the rights of others; pay their taxes promptly; that they have civic pride, and a co-operative spirit in understanding community projects. There is definite need for improvement in each of the above respects. A new school at home should help our youth assume these responsibilities.

In addition to the need for recreational and library facilities, other needs are: a municipal water system, sewerage, improved public transportation facilities, shopping districts, playgrounds, and improvement in the appearances of some homes and property.

How to go about making these improvements in our community will be the task of the future voters. An adequate educational program at home could prepare our youth to see and meet these needs.

The program of studies should provide for both the common and special needs of our youth. They can be met in two general ways.

1. By providing subject matter in the different courses and other activities in which pupils have an opportunity to participate.
2. By providing teaching methods which guide and direct the educational activities of our youth not only in school but in other phases of their whole life.

The common needs of our pupils can be provided for by requiring all students to take certain subjects and activities. However, no two students should do exactly the same work in the same way. Students should have some choice as to what they do, and how they will go about doing their work. This will enable each student to meet both his common and special needs.

The importance of using good teaching methods as an aid in meeting the common needs cannot be overlooked. Each pupil must be taught to think for himself through the use of methods that stress thinking and problem solving rather than just rote memory.

Teaching methods should give consideration to the fact that pupils differ in their rates of thinking and learning. They differ materially in their ability and achievement. To meet these individual differences, individual instruction should be provided as much as possible and each pupil should be allowed to progress at his own rate. The result will be

that pupils will complete their assignments or courses with different achievements. This is desirable and will be encouraged as long as pupils work up to their capabilities. Adequate guidance should be the key to the success of this policy.

Our teaching should stress the development of good work and study habits on the part of each pupil in the classroom, shop and laboratory.

Before proceeding any further, several observations concerning the needs of adolescents should be noted. First, let us think about the junior high school group--seventh, eighth and ninth grade pupils. What are their needs?

Bolton, Cole and Jessup have this to say:

> "The junior high school is based fundamentally upon the psychological needs of the early adolescent years. The youth at this stage are developing rapidly away from childhood and yet are not quite mature enough mentally and socially to profit fully by being taught with those in the senior high school. Were it not for these characteristics of development the junior high school would not be justified." 1/

Norton has emphasized the same idea in a recent statement that:

> "The junior high school is not a glorified elementary school; neither is it a young high school or a vocational or trade school. Changing the habitat, erecting a new building and calling it a junior high school does not make it one. A school is a junior high school only to the extent to which its courses of study and administration conform to the needs of adolescent youth." 2/

Early adolescence is a period of life in which the individual must be guided toward certain goals. He must be taught to understand the world about him; to learn to think clearly; to master the fundamental

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1/F. E. Bolton, T. R. Cole, J. H. Jessup, The Beginning Superintendent, The Macmillan Co., New York, New York, 1937, p. 581.

2/John K. Norton, "Creating a Curriculum for Adolescent Youth," Research Bulletin, National Education Association, Volume 6, (January, 1928,)p. 5.

skills; to learn scientific facts; to learn to assume responsibility; and to develop self-direction. He must be given vocational guidance through exploratory courses.

By the time the pupil reaches the senior high school (grades 10, 11, 12), he should be more matured mentally, physically, and emotionally, and should know what his life work is going to be so that a more diversified program of studies can be followed. If he has not decided, grade 10 will provide more exploratory experiences to help him find himself. The following is an outline of the goals for each grade.[1/]

Grade 7

"We assume that the fundamental tool subjects have been learned in the elementary school. The individual moves to the junior-senior high school. To make good articulation this grade is very much like the preceding."

Grade 8

"This is a grade of transition. The pupil has made social, emotional and mental adjustments, and is now beginning to find himself. He is using the newly acquired knowledge and skill to develop himself so that he can assume his social, economic and civic responsibilities."

Grade 9

"This year is exploratory. The pupil is concerned with finding his life work. Many experiences will be arranged for him in as many fields of learning as is possible. Enough experiences will be given so that he may tentatively choose his vocation. There will be provisions for change if his choice seems to be wrong."

Grade 10

"This year is devoted to furthering the pupil's chosen plan, or,

1/H. W. Nickerson, Building a High School Program of Studies that Meets the Needs of the Pupils of Edgartown, Unpublished Master's Thesis, Boston University, Boston, Massachusetts, 1945, p. 54.

if he has not made a choice, he will continue until he does. He will be guided and helped at every opportunity to come to a favorable decision. Testing and guidance will help him get into a field in which he is capable and will be happy and successful."

Grade 11

"Progressing toward that life goal, following that well-thought-out educational plan."

Grade 12

"This year should see the accomplishment of the plan laid down in grades 9 or 10."

5. The Proposed Junior-Senior High School Program for North Smithfield

The program of studies should be designed to include a single curriculum, sometimes referred to as a constants with variables program. Under this plan the traditional pattern of having multiple curricula, such as Classical, Scientific, General and Business Curricula would be eliminated. Without these requirements the individual student's program of studies could then be selected solely on the basis of his personal needs and interests. The success of this plan would require guidance.

Billett 1/ believes that only certain subjects should be taken by all students who are preparing for different vocations. These common subjects should be taken because they are essential, or required by law.

The length of the school day under the proposed plan would be five hours, each period being 50 minutes in length. There should be six periods a day, five days a week, making a total of 30 periods per week.

Twenty-seven periods of class work in grades 7-12 would be required of each student, the three remaining periods to be used for study purposes.

1/Roy O. Billett, Report of School Survey, Town of Grafton, Massachusetts, 1947.

In grades 7, 8, 9 all subjects should be required. Talented students in these grades might elect extra periods of art and instrumental music with the permission of the principal and counselor. In grades 10, 11, 12 each student should be required to elect 10 points under guidance, in addition to the 17 points of required subjects.

Study classes should be held in the library for students who wish to use it; in available classrooms; in the cafeteria; and in other rooms when they are available.

Guidance should be given once a week. In grades 7, 8, 9 it should be handled by the home-room teacher, and in grades 10, 11, 12 by the counselor with the assistance of the home-room teacher.

It would be the duty of the home-room teacher to gather data, keep complete personal records of students and to encourage them. The counselor would continue to collect data from many sources when students come under his direction, and to assist them with their present problems and plans for the future. He would help them after they leave school. The counselor directs the whole guidance program in grades 7-12.

The program of studies.-- The following program of studies should be provided for our pupils.

English

This subject should be offered as a required subject in grades 7-12. It should include reading, oral and written composition, spelling, penmanship and literature. For those preparing for college, the course should be constructed to meet entrance requirements.

For the non-college group, English would include reading and inter-

pretations of newspapers and magazines, reading for pleasure and other activities to be noted under oral English.

Oral English

This phase of the subject should afford training in the development of enunciation, poise and self-confidence. It would include a study of grammar and the correct use of words. In addition, this course should include such practical procedures as:

1. Applying for positions
2. Carrying on telephone conversations
3. Introducing speakers to an audience
4. Acting as chairman of a meeting
5. Presenting motions, or speaking in meetings
6. Presentation and acceptance of gifts
7. Telling personal experiences
8. Taking part in short plays

Written English

There should be lessons in spelling, writing letters, book reports and compositions.

Reading

There should be experiences provided in:

1. Information reading
2. Problem reading
3. Reading for report
4. Reference reading
5. Reading for pleasure

Literature should provide further experiences in reading. It should be part of the English course. Its primary purpose should be to stimulate interest in reading and to improve the aesthetic and cultural aspects of the individual student.

In teaching English, emphasis should be placed upon its importance in other school work and in students' daily lives.

Social Studies

All social studies subjects should be required of all pupils. They should be centered for the most part around current social problems of immediate interest and concern to the students. Certain phases of geography, history, civics and economics should be taught which are going to help students become intelligent and sincere with regard to social problems. Students should learn about their local, state and national governments. They should learn of the social problems of the community and how to improve them.

Good citizenship is a quality to be stressed in teaching the social studies.

United States history and geography should be taught in the seventh and eighth grades.

Social studies in grade 9 should deal with civics. Preparation for citizenship in the local government should be stressed.

In a local high school a project on "Town Planning" could be provided for study. Concerning the need for such a project, Payson Smith [1]

1/Payson Smith, Town Planning for Schools, New England Planning Association, 1935.

wrote:

> "Town planning for schools provides for the carrying out of an interesting and well-developed project or activity in the field of citizenship. The use of the home community as a laboratory carries strong appeal as being pedagogically sound as well as educationally worthwhile."

Community civics should aim to teach civic competence by providing our students with a knowledge of the community and ways of improving it.

World history should be taught in the tenth grade. It should lay particular emphasis upon world history as it affects our lives today.

United States history and government should be taught in grade 11. Each should be taught for one semester. United States history in grade 11 should be a continuation of the history taught in the seventh and eighth grades. It should trace the events and happenings in this country up to the present time and the effects of these incidents upon our lives.

United States government should deal with a study of local, state and national governments. This subject should be a continuation of civics taught in the ninth grade. From a study of this subject students may be expected to acquire greater understanding of the American way of life.

Problems of democracy should be taught in grade 12. This subject should provide pupils with an opportunity to study current social, political and economic problems.

<u>Science</u>

The science courses should be required of all students in grades 7, 8, 9. In grades 10, 11, 12 they should be elective for those who

will need them. Each course in grades 7-12 should be developed around problems of daily living that require science for their solution.

Science is taught in our elementary schools and should be continued each year throughout each pupil's school life.

General science should be taught in grades 7, 8, 9; biology in grade 10; chemistry in grade 11; and physics in grade 12. General science should teach a greater understanding of the world about us, as it appeals to the early adolescent. Biology should be centered around the functions of life, and should deal with plants, animals and man.

Chemistry should be concerned with the matter of the universe and the laws governing its use, and physics should teach about heat, light, electricity, sound and mechanics.

There should be appropriate laboratory exercises for each science class. Teachers of general science in grades 7, 8, 9 should conduct demonstrations from time to time with the assistance of members of the classes during regular class periods.

Biology, chemistry and physics should include at least two periods of laboratory work each week in addition to three recitation periods. In the cases of college preparatory students, four periods of laboratory work should be required for each subject per week to meet college entrance requirements. Two study periods would have to be used for this extra laboratory work.

Mathematics

General mathematics in grades 7 and 8 will be confined to the teaching of arithmetic with emphasis on mastery of the fundamental

skills, and general mathematics in grade 9 will include problems found in everyday living. Algebra I is for the college preparatory group of students. All ninth grade students should be required to choose one of these two subjects.

Plane geometry, algebra II, trigonometry and solid geometry should be elective subjects. Students planning to enter the Armed Services should be allowed to elect all mathematics courses.

Plane geometry should be taught in grade 10; algebra II in grade 11; and trigonometry and solid geometry in grade 12, the latter two for one semester each.

Art

Art should be included in the program as a required subject in grades 7-12. Students with a particular talent for art should be allowed to study more periods with the approval of the principal and guidance counselor.

According to Billett 1/ the objectives of the art course should be:

1. "To help pupils acquire capacity for appreciating and enjoying beauty wherever they find it.
2. To help pupils become more and more capable of exercising judgment in the selection of design, color and construction of the objects comprising their personal possessions or forming a part of their home or community environment.
3. To give pupils an opportunity for self-expression through interaction with the materials or media with which art is concerned.
4. To help pupils to become intelligent consumers of art.

1/Roy O. Billett, Fundamentals of Secondary School Teaching, Houghton Mifflin Co., Boston, Massachusetts, 1940, p. 406.

5. To help pupils to explore their aptitudes and interests as producers of various types of art."

Music

Music should include singing; playing a variety of instruments; guided listening to vocal and instrumental music; music reading; theory of music; and the history of music. Music appreciation should be required in all grades 7-12. In addition, instrumental music might be studied with approval in all grades 7-12.

The main objectives of the course should be to train students to become good listeners, appreciative of good music, and should aid in the development of talent.

Home Economics

The following courses included in the field of practical arts are: home economics, industrial arts and commercial subjects. Each should be offered to our students starting in the seventh grade. Home economics should be required of all girls in grades 7, 8, 9 and elective for boys and girls in grades 10, 11, 12.

Home economics should include a study of foods, clothing, shelter, finance, family relations, children, human relations, social customs, etiquette and courtesies.

Under the study of foods thought should be given to meal planning, preparation and serving of food, and an exploration of such occupational opportunities as dietitian, chef, cook, etc.

A study of clothing should include: the clothing budget, grooming, buying, patterns, sewing, millinery, making garments, washing and care of garments.

used in industries.

2. Experience in production methods and in handicrafts.

3. Practice in identifying the more important methods employed in industry (local and in neighboring cities).

4. Selection and use of some of the common products for project work.

5. Interpretations of the sources, principles, and applications of power, such as steam, water, internal combustion, and electricity.

6. Study of the origin and effects of significant inventions.

7. Study of materials from source to completed object.

8. Study of vocational opportunities, living conditions, remuneration of workers."

Business Education

Business education should include bookkeeping, typewriting and stenography. Each should be offered as an elective subject. Bookkeeping and typewriting should be offered in the tenth, eleventh and twelfth grades; and stenography in the eleventh and twelfth grades.

Every pupil should be encouraged to take at least one year of typewriting. It is helpful for students to be able to typewrite themes, friendly letters, invitations, telegrams, menus, recipes, copy for the school paper, materials for everyday occasions, and for college and the home as well as business.

Health and Physical Education

Health and physical education should each be required once a week in all grades 7-12. This would meet the requirements of the State Department of Education of Rhode Island.

Health should be taught by the school nurse, and if necessary by other teachers.

It should include such topics as: (1) personal health; (2) household sanitation; (3) community sanitation and health; (4) prevention and control of disease; (5) illness in the home; (6) the sick room; (7) care of the patient; (8) food for the sick; (9) first aid in the home, in the factory, on the highway and in public buildings.

Physical education should include supervised exercises, games and sports held in the gymnasium and on the out-of-door playground; also basketball and various other indoor games and activities. All activities should be under the supervision of the physical education teachers.

Assembly Programs

Assembly programs should be held once a week for all pupils in each grade. Not all students will be present at some assembly programs. The nature of the assembly and the size of the auditorium would determine the number present. However, an auditorium large enough to seat the entire student body should be available.

Assembly programs should include such activities as:

1. Observance of American Education Week
2. Plays and entertainments
3. Concerts
4. Exhibits and demonstrations
5. Movies

Library Program

Our library should have adequate space for seating 6-15 per cent[1] of the school's enrollment comfortably. In addition, it should be well stocked with reading volumes, reference books, magazines, publication, and newspapers for both student and teacher use. Relative to this Engelhardt, Engelhardt, and Leggett[2] say:

"A minimum of five books per pupil is essential in a school library. The average school library, however, provides in the neighborhood of ten books per student while in the exceptional school this figure runs as high as twenty."

Therefore, for an enrollment of 400 pupils it would be necessary to have a minimum of two thousand volumes on the shelves for research purposes.

A school of this size which will employ at least twelve teachers should have a full-time librarian. Bolton, Cole and Jessup[3] are in agreement on this point. They say:

"Every school system employing twelve to fifteen teachers housed in the same building should have a full-time librarian."

There will be no library period as such.

The teaching of library techniques will be included under English.

1/Ward G. Reeder, The Fundamentals of Public School Administration, The Macmillan Company, New York, New York, 1941, p. 683.

2/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 126.

3/F. E. Bolton, T. R. Cole, J. H. Jessup, The Beginning Superintendent, The Macmillan Company, New York, New York, 1937, pp. 212-213.

Also, with a full-time librarian the library will be available during the entire school day to all students who have permission of their teachers to use it.

The objectives of this library should be:[1]

1. "To enrich the school curriculum by providing library service for pupils and teachers.
2. To acquire and organize library materials for school service.
3. To give instruction in the independent use of libraries and of books as tools.
4. To share with other departments of the school responsibility for fruitful social training.
5. To foster informational reading as a life habit.
6. To encourage the habit of reading for pleasure.
7. To develop the library habit."

In the absence of a municipal public library it might be possible to construct and conduct the high school library for the use of the community.

Foreign Languages

Many colleges require some study of foreign languages for admission. There seems to be a trend toward a decrease in the number of years of Latin offered in high school and an increase in the offerings of modern languages. Also, the study of modern languages is important for students who plan to enter the Armed Services.

A knowledge of French would be of great value to students who plan to work in near-by Woonsocket where approximately 85 per cent of

1/Edith A. Lothrup, "The Library in the Small High School," The Library Journal, (September, 1929), 54:737-741.

the people speak this language.

Our program should include Latin, French and other languages for which there will be a demand large enough to justify a class.

In teaching languages emphasis should be placed upon reading and speaking the language, and the use of current literature and periodicals as teaching aids.

Activities Period

The assembly, guidance and club programs will occur in activities periods to be held in all grades 7-12. There will be three activities periods each week.

Extra-curricular activities, such as football and baseball, will take place after school.

Program of Studies

The following detailed program of studies for each grade will include a list of required and elective subjects; the number of periods per week designated for each subject; the total number of study periods per week; and the length of time per period.

This program of studies has been used to compute the number of regular classrooms and special classrooms needed in planning the building.

The success of this program of studies will depend largely upon each teacher's ability to organize her teaching plan to include a sufficient amount of supervised study during recitation periods. If this practice is not followed, course requirements cannot be met due to the limited number of study periods each week.

6. Proposed Program of Studies

Grade 7

Required Subjects	Length of Periods	Periods per Week
English	50 minutes	5
Arithmetic	50 "	5
Social Studies	50 "	5
General Science	50 "	3
Study Periods	50 "	3
Home Economics for Girls or Industrial Arts for Boys	50 "	2
Health	50 "	1
Physical Education	50 "	1
Art Appreciation	50 "	1
Music Appreciation	50 "	1
Activities		3
1. Assembly	50 "	1
2. Guidance	50 "	1
3. Clubs (Hobby or Civics)	50 "	1
Total periods per week		30
Elective Subjects		
Art Skill	50 "	1
Instrumental Music	50 "	1

All subjects in the seventh grade would be required.

Pupils who have special talent and are interested may elect an extra period of art and/or instrumental music with the approval of the

principal and the guidance counselor. These electives would be taken out of the three study periods.

Extra credit will be received for this study.

Grade 8

Required Subjects	Length of Periods	Periods per Week	
English	50 minutes		5
Arithmetic	50 "		5
Social Studies	50 "		5
General Science	50 "		3
Study Periods	50 "		3
Home Economics for Girls or Industrial Arts for Boys	50 "		2
Health	50 "		1
Physical Education	50 "		1
Art Appreciation	50 "		1
Music Appreciation	50 "		1
Activities			3
1. Assembly	50 "	1	
2. Guidance	50 "	1	
3. Clubs (Hobby or Civics)	50 "	1	
Total Periods per week			30
Elective Subjects			
Art Skill	50 "		1
Instrumental Music	50 "		1

All subjects in the eighth grade would be required.

Pupils who have special talent and are interested may elect an extra period of art and/or instrumental music with the approval of the principal and the guidance counselor. These electives would be taken

out of the three study periods.

Extra credit would be received for this study.

Grade 9

Required Subjects	Length of Periods	Periods per Week	
English	50 minutes		5
General Mathematics			
or Algebra I	50 "		5
Civics	50 "		5
General Science	50 "		3
Study Periods	50 "		3
Home Economics for Girls			
or Industrial Arts for Boys	50 "		2
Health	50 "		1
Physical Education	50 "		1
Art Appreciation	50 "		1
Music Appreciation	50 "		1
Activities			3
1. Assembly	50 "	1	
2. Guidance	50 "	1	
3. Clubs (Hobby or Civics)	50 "	1	
Total Periods per Week			30
Elective Subjects			
Art Skill	50 "		1
Instrumental Music	50 "		1

All subjects in the ninth grade will be required.

Pupils who have special talent and are interested may elect an extra period of art and/or instrumental music with the approval of

the principal and the guidance counselor. These electives would be taken out of the three study periods.

Extra credit would be received for this study.

Grade 10

Required Subjects	Length of Periods	Periods per Week
English	50 minutes	5
World History	50 "	5
Study Periods	50 "	3
Health	50 "	1
Physical Education	50 "	1
Art Appreciation	50 "	1
Music Appreciation	50 "	1
Activities		3
1. Assembly	50 "	1
2. Guidance	50 "	1
3. Clubs (Hobby or Civics)	50 "	1

Elect ten points

Elective Subjects		
Plane Geometry	50 "	5
Biology	50 "	5
* Foreign Language	50 "	5
Home Economics	50 "	5
Shop and Mechanical Drawing	50 "	5
Bookkeeping I	50 "	5
Typewriting I	50 "	5
Art Skill	50 "	5
Instrumental Music	50 "	1
Total periods per week		30

*Latin I or Modern Language

Each student in the tenth grade must choose ten points in addition to the required subjects.

Biology will include three recitation periods per week and at least two laboratory periods. College preparatory students who elect biology should take two additional periods of laboratory work. These would be taken out of the three study periods.

Students who have special talent and are interested may elect an extra period of instrumental or vocal music with the approval of the principal and guidance counselor. This elective would be taken out of the three study periods.

Extra credit would be received for the study of instrumental or vocal music.

Art skill for students with creative ability may be taken as an elective for five points.

Grade 11

Required Subjects	Length of Periods	Periods per Week
English	50 minutes	5
United States History and Government	50 "	5
Study Periods	50 "	3
Health	50 "	1
Physical Education	50 "	1
Art Appreciation	50 "	1
Music Appreciation	50 "	1
Activities		3
1. Assembly	50 "	1
2. Guidance	50 "	1
3. Clubs (Hobby or Civics)	50 "	1

Elect ten points

Elective Subjects		
Algebra II	50 "	5
Chemistry	50 "	5
* Foreign Language	50 "	5
Home Economics	50 "	5
Shop and Mechanical Drawing	50 "	5
Bookkeeping I	50 "	5
Stenography I	50 "	5
Typewriting I or II	50 "	5
Art Skill	50 "	5

Elective Subjects	Length of Periods	Periods per Week
Instrumental Music	50 minutes	1
Total periods per week		30

*Latin I or II or Modern Language

Each student in the eleventh grade must choose ten points in addition to the required subjects.

Chemistry would include three recitation periods per week and at least two laboratory periods. College preparatory students who elect chemistry should take two additional periods of laboratory work. These would be taken out of the three study periods.

Students who have special talent and are interested may elect an extra period of instrumental or vocal music with the approval of the principal and guidance counselor. This elective would be taken out of the three study periods.

Extra credit would be received for the study of instrumental or vocal music.

Art skill for students with creative ability may be taken as an elective for five points.

Elective Subjects	Length of Periods	Periods per Week
Instrumental Music	50 minutes	1
Total periods per week		30

*Latin I, II, III or Modern Language

Each student in the twelfth grade must choose ten points in addition to the required subjects.

Physics would include three recitation periods per week and at least two laboratory periods. College preparatory students who elect physics would take two additional periods of laboratory work. These would be taken out of the three study periods.

Students who have special talent and are interested may elect an extra period of instrumental or vocal music with the approval of the principal and guidance counselor. This elective would be taken out of the three study periods.

Extra credit would be received for the study of instrumental or vocal music.

Art skill for students with creative ability may be taken as an elective for five points.

7. Aids in a Small High School

In a small high school where there is bound to be a limited number of teachers, certain steps must be taken to enrich the program of studies. Therefore, the following procedures should be considered in this school:

1. Alternation of Subjects

Such subjects as chemistry, physics and foreign languages could

be alternated on an annual basis. For example, chemistry could be taught one year and physics the next year. The same plan could be followed in teaching foreign languages.

2. Combination of Classes

In the case of subjects that cannot be alternated due to a natural sequence or close follow-up of successive new materials, a combination of classes can be arranged. In these classes it would be necessary to provide the unit assignment method of instruction. This facilitates a combination of classes.

Latin I and II, French I and II are classes that can be combined. The use of this plan will decrease the number of small classes, increase the pupil-teacher ratio, lower per pupil cost of instruction, and provide opportunities for enrichment.

3. Supervised Correspondence Study

This procedure is capable of enriching the small high-school program by providing courses that can be studied on an individual basis. There would have to be an adequate supply of materials on hand to care for the needs of such extra courses.

By eliminating a number of small classes each teacher would have fewer daily preparations to make. Universities are preparing materials that make it possible for any teacher to supervise correspondence study.

4. Differentiated Unit Assignment

This type of instruction is an important means of improving instruction and it provides for individual differences in ability, interests, aims and needs. It makes possible a combination of classes already described.

5. Audio-Visual Aids

The use of audio-visual aids is valuable. Maps, charts, film strips, lantern slides, movies, record player and recording machine are but a few items that are a part of a school's audio-visual education department.

Suitable building facilities are necessary for the projection of films and lantern slides, and the development of the audio-visual educational program as a whole.

All teachers should be trained to make good use of audio-visual aids materials and equipment, because when used properly audio-visual aids make the learning experience far more concrete and interesting for students.

CHAPTER III

EDUCATIONAL SPECIFICATIONS FOR A SCHOOL BUILDING TO IMPLEMENT THE PROPOSED EDUCATIONAL PROGRAM

This chapter describes the kind of secondary school plant which is needed to house the educational program outlined in the previous chapter.

The functions of the school plant:-- The functions of a school plant are threefold: (1) to implement the educational program which is designed to meet the needs of the youth it is to serve; (2) to enable teachers to carry out their duties effectively and provide facilities which will aid students in all phases of their school life; (3) to provide adequate facilities for community use.

It is the purpose of this chapter to produce the educational specifications needed by the architect for implementing the program proposed in chapter two.

Needed information:-- First, it will be necessary to determine the number of students to be served in the school by grades. According to the Consultants[1/] the building should be designed to accommodate 400 pupils, and should include grades 7-12. At present there are 354 North Smithfield students attending grades 7-12; 133 of this number attend grades 7 and 8 in North Smithfield; and 221 attend grades 9-12 in out-of-town high schools.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, School Building Survey of North Smithfield, Rhode Island, op. cit.,p.34.

On the basis of these present figures and the above recommendation of the Consultants, the writer recommends that a junior-senior high school building be constructed to accommodate 400 students. Construction should be started in 1954, so that the building could be completed by 1956 when the estimated enrollment shown in Table 1 below will be 397 students.

It is proposed that grades 7-12 be accommodated in this building.

The following table was submitted by the Consultants in their report on North Smithfield School buildings to show the estimated enrollments in grades 7-12 for the years 1950-1962.

Table 1
Estimated Total Enrollments of North Smithfield Students in Grades 7-12

Year	Enrollment
1950	298
1951	330
1952	355
1953	343
1954	369
1955	388
1956	397
1957	392
1958	385
1959	407
1960	406
1961	390
1962	380

The following table shows the present enrollments and the estimated enrollments by grades through 1956. The estimated enrollments by grades were not stated by the Consultants in their report, but are the predictions of the writer. They are based upon the present enrollments in North Smithfield elementary and junior-senior high school grades.

No allowances are made for possible increases or decreases in enrollments that may occur.

Figures for 1952 are based upon present enrollments. Figures for 1953-1956 are estimated.

Table 2
Estimated Enrollments by Grades

Grade	7	8	9	10	11	12	Totals: Writer's Estimates	Totals: Consultants' Estimates
Year								
1952	70	58	49	71	44	62	354	355
1953	60	70	58	49	71	44	352	343
1954	80	60	70	58	49	71	388	369
1955	70	80	60	70	58	49	387	388
1956	75	70	80	60	70	58	412	397

The above table does not show any large discrepancies between the Consultants' and the writer's total estimated enrollments per year. Therefore, the writer's figures for estimated enrollment per grade will be used in determining classroom requirements.

Second, it will be necessary to determine the number of classrooms, laboratories, and shops needed to carry out the proposed program. To do this, the following data and formula will be used:

1. Program of studies with required and elective subjects
2. Number of recitations per week in each subject
3. Estimated number of students in each subject
4. Number of instructional periods in the school week
5. The desired average size of classes
6. The Anderson Formula[1/] for determining

1/H. W. Anderson, "A Method for Determining the Housing Requirements of Junior High School Programs," University of Iowa Studies, The University, Iowa City, Iowa, Volume III, Number 3, April 1, 1926.

the housing requirements of junior high school programs - grades 7, 8, 9

7. T. C. Holy's[1] values for "S". By substituting these values in the Anderson Formula it can also be used for determining the housing requirements of senior high school programs - grades 10, 11, 12

The program of studies already proposed will be restated now, showing required and elective subjects with estimates of the number of students who will take each subject; and the number of recitations in each subject per week.

Estimates of the number of students who will take each required subject will be based upon the estimated enrollment per grade (Table 2) for 1956, the probable year for completion of the building. Estimates of the number who will take each elective subject will be made from the percentage of students taking each elective subject in 1951 in nearby high schools similar to the one we plan.

1. Program of Studies with Number of Periods per Week and Enrollment

Grade 7

Required Subjects	Periods per Week	Estimated Enrollment
English	5	75
Arithmetic	5	75
Social Studies	5	75
General Science	3	75
Study Periods	3	75
Home Economics for Girls		45
or Industrial Arts for Boys	2	30
Health	1	75

(Concluded on next page)

1/T. C. Holy, "What is Good Utilization of a School?", The School Executive, (November 1948).

Grade 7 (Concluded

Required Subjects	Periods per Week		Estimated Enrollment
Physical Education		1	75
Art Appreciation		1	75
Music Appreciation		1	75
Activities		3	75
1. Assembly	1		
2. Guidance	1		
3. Clubs (Hobby or Civics)	1		
Total periods per week		30	
Total periods of instruction per week		27	
Total study periods per week		3	
		30	
Elective Subjects			
Art Skill		1	25
Instrumental Music		1	25

Grade 8

Required Subjects	Periods per Week		Estimated Enrollment
English		5	70
Arithmetic		5	70
Social Studies		5	70
General Science		3	70
Study Periods		3	70
Home Economics for Girls			40
or Industrial Arts for Boys		2	30
Health		1	70
Physical Education		1	70
Art Appreciation		1	70
Music Appreciation		1	70
Activities		3	70
1. Assembly	1		
2. Guidance	1		
3. Clubs (Hobby or Civics)	1		
Total periods per week		30	
Total periods of instruction per week		27	
Total study periods per week		3	
		30	
Elective Subjects			
Art Skill		1	25
Instrumental Music		1	25

Grade 9

Required Subjects	Periods per Week		Estimated Enrollment
English		5	80
General Mathematics			30
or Algebra I		5	50
Civics		5	80
General Science		3	80
Study Periods		3	80
Home Economics for Girls			45
or Industrial Arts for Boys		2	35
Health		1	80
Physical Education		1	80
Art Appreciation		1	80
Music Appreciation		1	80
Activities		3	80
1. Assembly	1		
2. Guidance	1		
3. Clubs (Hobby or Civics)	1		
Total periods per week		30	
Total periods of instruction per week		27	
Total study periods per week		3	
		30	
Elective Subjects			
Art Skill		1	25
Instrumental Music		1	25

Grade 10

Required Subjects	Periods per Week		Estimated Enrollment
English		5	60
World History		5	60
Study Periods		3	60
Health		1	60
Physical Education		1	60
Art Appreciation		1	60
Music Appreciation		1	60
Activities		3	
1. Assembly			
2. Guidance			
3. Clubs (Hobby or Civics)			

Elect ten points

Elective Subjects			
Plane Geometry		5	25
Biology			
1. College Preparatory		7	15
a. Recitation	3		
b. Laboratory	4		

(Concluded on next page)

Grade 10 (Concluded)

Elective Subjects	Periods per Week	Estimated Enrollment
Biology		
2. Non-College Preparatory	5	10
a. Recitation	3	
b. Laboratory	2	
Latin I	5	25
French I	5	15
Home Economics	5	20
Shop and Mechanical Drawing	5	20
Bookkeeping I	5	20
Typewriting I	5	35
Art Skill	5	10
Instrumental Music	1	10
Total periods per week	30	
Total periods of instruction per week	27	
Total study periods per week	3	
	30	

Biology should include three recitation periods per week for all students who take the course; four laboratory periods for the college preparatory group; and two laboratory periods for the non-college preparatory group.

Grade 11

Required Subjects	Periods per Week	Estimated Enrollment
English	5	70
United States History and Government	5	70
Study Periods	3	70
Health	1	70
Physical Education	1	70
Art Appreciation	1	70
Music Appreciation	1	70
Activities	3	70
1. Assembly	1	
2. Guidance	1	
3. Clubs (Hobby or Civics)	1	

Elect ten points

Elective Subjects		
Algebra II	5	25

(Concluded on next page)

Grade 11 (Concluded)

Elective Subjects	Periods per Week	Estimated Enrollment
Chemistry		
1. College Preparatory	7	20
a. Recitation	3	
b. Laboratory	4	
2. Non-College Preparatory	5	15
a. Recitation	3	
b. Laboratory	2	
French I	5	35
Latin II	5	25
Home Economics	5	20
Shop and Mechanical Drawing	5	20
Bookkeeping I	5	20
Bookkeeping II	5	20
Stenography I	5	25
Typewriting I	5	35
Typewriting II	5	25
Art Skill	5	10
Instrumental Music	1	10
Total periods per week	30	
Total periods of instruction per week	27	
Total study periods per week	3	
	30	

Chemistry should include three recitation periods per week for all students who take the course; four laboratory periods for the college preparatory group; and two laboratory periods for the non-college preparatory group.

Grade 12

Required Subjects	Periods per Week	Estimated Enrollment
English	5	58
Problems of Democracy	5	58
Study Periods	5	58
Health	1	58
Physical Education	1	58
Art Appreciation	1	58
Music Appreciation	1	58
Activities	3	58
1. Assembly	1	
2. Guidance	1	
3. Clubs (Hobby or Civics)	1	

(Concluded on next page)

Grade 12 (Concluded)

	Periods per Week		Estimated Enrollment
Elect ten points			
Elective Subjects			
Trigonometry and Solid Geometry		5	10
Physics			
1. College Preparatory		7	20
a. Recitation	3		
b. Laboratory	4		
2. Non-College Preparatory		5	5
a. Recitation	3		
b. Laboratory	2		
French II		5	25
Latin III		5	10
Home Economics		5	20
Shop and Mechanical Drawing		5	20
Stenography II		5	25
Typewriting I		5	25
Typewriting II		5	25
Typewriting III		5	25
Bookkeeping II		5	20
Art Skill		5	10
Instrumental Music		1	10
Total periods per week		30	
Total periods of instruction per week		27	
Total study periods per week		3	
		30	

Physics should include three recitation periods per week for all students who take the course; four laboratory periods for the college preparatory group; and two laboratory periods for the non-college preparatory group.

As shown above, each grade, 7-12, will have 27 instructional or recitation periods per week for all students.

The desired average size of each class is to be 25 students with the exception of industrial arts and home economics, and classes in which the estimated enrollment per subject is less than 25. For industrial arts and home economics, the desired average size of class is to be 20; and for

each subject in which the estimated enrollment is less than 25, it will be determined by the estimated enrollment. Dr. Michael F. Walsh, Commissioner of Education in Rhode Island, has recommended that the writer use the above figures in determining the number of classrooms needed.

The Anderson Formula[1/] derived by Dr. Homer W. Anderson is used to determine the number of rooms required for each subject in grades 7, 8, 9. It is as follows:

$$\text{Number of rooms} = \frac{\text{Anderson Formula}}{\frac{\text{Pupil periods per week}}{\text{Desired average size of class}} \times \text{Total instructional periods per week}} \times (1-s)$$

The following is an explanation of the Anderson Formula.

Pupils periods per week refer to the number of pupils reciting a definite number of periods per week.

The desired average sizes for the different classes have already been stated. They refer to the ideal sizes of classes to insure best teaching results.

Periods per week refer to the total number of instructional periods per week. As previously stated there will be 27 for each grade.

Anderson has designated S to represent the per cent of the total number of classroom periods unoccupied during the week and 1-S, as used in the formula, to represent the per cent of the total number of classtoom periods occupied during the week.

1/H. W. Anderson, op. cit. p. 36.

According to Anderson[1] the value of S for standard classrooms in small junior high schools similar to North Smithfield's is zero, and in special classrooms of the same size schools, S is equal to 0.12. This means that standard classrooms can be used 100 per cent of the time; and special classrooms at best 88 per cent of the time.

T. C. Holy[2] has different estimates of the values of S in determining the per cent of the time that senior high school classrooms can be used. He recognizes that senior high schools cannot use their classrooms as economically as junior high schools. He states that standard classrooms in senior high schools can be used only 85 per cent of the time, and special classrooms 70 per cent of the time. In terms of the Anderson Formula this would mean that S equals 0.15 for standard classrooms and S equals 0.30 for special classrooms in senior high schools.

By substituting T. C. Holy's values for S in the Anderson Formula it can also be used for determining the number of rooms required per subject for grades 10, 11, 12.

For clarity the Anderson Formula for computing room requirements is restated below.

$$\text{Number of rooms} = \frac{\text{Pupil periods per week}}{\text{Desired average size of class} \times \text{Total instructional periods per week}} \times (1-S)$$

The next step will be to determine the number of rooms needed per subject, in grades 7, 8, 9, using the Anderson Formula, and then in grades 10, 11, 12, using the same formula with Holy's values for S.

1/H. W. Anderson, op. cit. p. 33.

2/T. C. Holy, "What is Good Utilization of a School?", The School Executive, (November 1948).

The steps followed by the writer in determining the number of rooms required for each subject are: (1) compute the numerator (Total pupil periods per week) and the denominator (Desired average size of class X Total instructional periods per week X (1-S)) of the Anderson Formula, using values related to the subject in question; (2) substitute these computations in the Formula, itself; (3) and perform the indicated division. These steps must be repeated for each subject.

However, the writer does compute the number of rooms required for similar subjects in one process in grades 7, 8, 9, and then in grades 10, 11, 12, when the desired average size of class is the same. For example, the room requirements for English, grades 7, 8, 9, can be computed in one process. This is a procedure suggested by Anderson.[1/]

The total pupil periods per week for each subject will be determined by using the following formula.[2/]

Pupil periods per week = Number of pupils X Number of recitations per week

Number of pupils in this study is the estimated enrollment per subject, and number of recitations per week is the number of instructional periods per week for each subject.

2. Number of Rooms Required in the Junior High School

Standard Classrooms

Required English — Grades 7, 8, 9

English, mathematics, social studies, and foreign languages, grades 7-12 are academic subjects for which standard classrooms can be used.

1/H. W. Anderson, op. cit. p. 37.

2/H. W. Anderson, op. cit. p. 21.

Using the above procedure for determining the number of rooms required for a particular subject, the number of rooms required for English in grades 7, 8, 9 can now be determined.

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9.

Estimated enrollment in English - Grade 7 - 75
" " " " - " 8 - 70
" " " " - " 9 - 80
Instructional periods per week for English - 5

Using the above formula (Pupil periods per week = Number of pupils X Number of recitations per week), pupil periods per week can be computed as follows:

Pupil periods per week for English - Grade 7 - 75 X 5 = 375
" " " " " " - " 8 - 70 X 5 = 350
" " " " " " - " 9 - 80 X 5 = 400
Total pupil periods per week for English - Grades 7, 8, 9 1125

Total pupil periods per week are used when computing room requirements for similar academic subjects in a single process.

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 1125 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Instructional periods per week X

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = zero:- per cent of total number of standard classroom periods unoccupied during the week in grades 7, 8, 9.
1-S = 1:- per cent of total number of standard classroom periods occupied during the week in grades 7, 8, 9.

This means that standard classrooms in grades 7, 8, 9 can be used 100 per cent of the time.

By substitution of the above values:

Denominator of Anderson Formula = 25 X 27 X 1

By substituting the above values of the numerator and denominator in the Anderson Formula, the number of rooms needed for required English in grades 7, 8, 9 is computed as follows:

Anderson Formula:-

$$\text{Number of rooms} = \frac{\text{Pupil periods per week}}{\text{Desired average size of class} \times \text{Instructional periods per week}} \times (1-S)$$

$$\text{Number of rooms} = \frac{1125}{25X27X1} = \frac{1125}{675} = 1.6$$

Number of standard classrooms needed for required English in grades 7, 8, 9 - 1.6

It can now be assumed, since the procedure for determining the number of rooms required for English in grades 7, 8, 9 has been outlined in detail, that from now on certain explanations of procedure can be omitted without confusing the reader.

Required Mathematics Grades 7, 8, 9

The number of rooms needed for Mathematics in grades 7, 8, 9 includes those needed for arithmetic in grades 7 and 8, and general mathematics and algebra I in grade 9. The computations are as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9.

Estimated enrollment in arithmetic - Grade 7 - 75
" " " " - " 8 - 70
" " " general mathematics - " 9 - 30
" " " algebra I - " 9 - 50
Instructional periods per week for each mathematics class - 5

Using the formula (Pupil periods per week = Number of pupils X Number of recitations per week) pupil periods per week are computed below.

Pupil periods per week for arithmetic - Grade 7 - 75 X 5 = 375
" " " " " " - " 8 - 70 X 5 = 350
" " " " " general mathematics - " 9 - 30 X 5 = 150
" " " " " algebra I - " 9 - 50 X 5 = 250
Total pupil periods per week for mathematics - Grades 7, 8, 9 1125

By substitution of above total pupil periods per week:

Numerator of Anderson Formula - 1125 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X
Instructional periods per week X

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = zero; 1-S = 1

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 1

Using the Anderson Formula, the number of rooms needed for required mathematics in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{1125}{25 \times 27 \times 1} = \frac{1125}{675} = 1.6$$

Number of standard classrooms needed for required mathematics in grades 7, 8, 9 - 1.6

Required Social Studies Grades 7, 8, 9

The number of rooms needed for required social studies includes those needed for history and geography in grades 7 and 8, and civics in grade 9. The computations are as follows:

Numerator - Total pupil periods per week - grades 7, 8, 9.

Estimated enrollment in social studies - Grade 7 - 75
" " " " " - " 8 - 70
" " " " " - " 9 - 80
Instructional periods per week for each social studies class - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for social studies - Grade 7 - 75 X 5 = 375
" " " " " " " - " 8 - 70 X 5 = 350
" " " " " " " - " 9 - 80 X 5 = 400

Total pupil periods per week for social studies - Grades 7, 8, 9 1125

By substitution of above total pupil periods per week:

Numerator of Anderson Formula - 1125 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = zero; 1 - S = 1

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 1

Using the Anderson Formula, the number of rooms needed for required social studies in grades 7, 8, 9 is:

$$\text{Number of Rooms} = \frac{1125}{25X27X1} = \frac{1125}{675} = 1.6$$

Number of standard classrooms needed for required social studies in grades 7, 8, 9 - 1.6

Special Classrooms

Required General Science Grades 7, 8, 9

General science and other subjects to follow in this study require special classrooms so that adequate space and equipment can be provided.

The number of rooms needed for required general science is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in general science - Grade 7 - 75
" " " " " - " 8 - 70
" " " " " - " 9 - 80
Instructional periods per week for each general science class - 3

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for general science - Grade 7 - 75 X 3 = 225
" " " " " " " - " 8 - 70 X 3 = 210
" " " " " " " - " 9 - 80 X 3 = 240
Total pupil periods per week for general science - Grades 7, 8, 9 675

By substitution of above total pupil periods per week:

Numerator of Anderson Formula - 675 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27 1/
S = 0.12 for special classrooms in grades 7, 8, 9.
1-S = 0.88

This means that special classrooms in grades 7, 8, 9 can be used only 88 per cent of the time.

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

1/H. W. Anderson, op. cit. p. 33.

Using the Anderson Formula, the number of rooms needed for required general science in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{675}{25X27X0.88} = \frac{675}{594} = 1.1$$

Number of special classrooms needed for required general science in grades 7, 8, 9 - 1.1

Required Home Economics for Girls — Grades 7, 8, 9

The number of special classrooms needed for required home economics for girls in grades 7, 8, 9 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in home economics - Grade 7 - 45
" " " " " - " 8 - 40
" " " " " - " 9 - 45
Instructional periods per week for each home economics class - 2

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for home economics - Grade 7 - 45 X 2 = 90
" " " " " " " - " 8 - 40 X 2 = 80
" " " " " " " - " 9 - 45 X 2 = 90
Total pupil periods per week for home economics - Grades 7, 8, 9 — 260

By substitution of above total pupil periods per week:

Numerator of Anderson Formula - 260 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 20
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 20 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for home economics in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{260}{20X27X0.88} = \frac{260}{475.2} = 0.54$$

Number of special classrooms needed for required home economics in grades 7, 8, 9 - 0.54

Required Industrial Arts Grades 7, 8, 9

The number of special classrooms needed for required industrial arts for boys in grades 7, 8, 9 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in industrial arts - Grade 7 - 30
" " " " " - " 8 - 35
" " " " " - " 9 - 35
Instructional periods per week for each industrial arts class - 2

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for industrial arts - Grade 7 - 30 X 2 = 60
" " " " " " " - " 8 - 30 X 2 = 60
" " " " " " " - " 9 - 35 X 2 = 70

Total pupil periods per week for industrial arts - Grades 7, 8, 9 190

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 190 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 20
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 20 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for required industrial arts in grades 7, 8, 9 is:

$$\text{Number of Rooms} = \frac{190}{20X27X0.88} = \frac{190}{475.2} = 0.39$$

Number of special classrooms needed for required industrial arts in grades 7, 8, 9 - 0.39

Required Health — Grades 7, 8, 9

The number of special classrooms needed for required health is as follows:

Numerator of the Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in health - Grade 7 - 75
" " " " - " 8 - 70
" " " " - " 9 - 80
Instructional periods per week for each health class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for health - Grade 7 - 75 X 1 = 75
" " " " " " - " 8 - 70 X 1 = 70
" " " " " " - " 9 - 80 X 1 = 80
Total pupil periods per week for health - Grades 7, 8, 9 — 225

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 225 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for required health in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{225}{25X27X0.88} = \frac{225}{594} = 0.37$$

Number of special classrooms needed for required health in grades 7, 8, 9 - 0.37

Required Physical Education Grades 7, 8, 9

The number of special classrooms (gymnasiums) needed for required physical education in grades 7, 8, 9 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in physical education - Grade 7 - 75
" " " " " - " 8 - 70
" " " " " - " 9 - 80
Instructional periods per week for each physical education class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for physical education - Grade 7 - 75 X 1 = 75
" " " " " " " - " 8 - 70 X 1 = 70
" " " " " " " - " 9 - 80 X 1 = 80
Total pupil periods per week for physical education - Grades 7, 8, 9 225

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 225 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for required physical education in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{225}{25X27X0.88} = 0.37$$

Number of special classrooms (gymnasiums) needed for required physical education in grades 7, 8, 9 - 0.37

Required Art Appreciation Grades 7, 8, 9

The number of special classrooms needed for required art appreciation is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in art appreciation - Grade 7 - 75
" " " " " - " 8 - 70
" " " " " - " 9 - 80
Instructional periods per week for each art appreciation class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for art appreciation - Grade 7 - 75 X 1 = 75
" " " " " " " - " 8 - 70 X 1 = 70
" " " " " " " - " 9 - 80 X 1 = 80
Total pupil periods per week for art appreciation - Grades 7, 8, 9 225

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 225 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for required art appreciation is:

$$\text{Number of rooms} = \frac{225}{25X27X0.88} = \frac{225}{594} = 0.37$$

Number of special classrooms needed for required art appreciation in grades 7, 8, 9 - 0.37

Required Music Appreciation Grades 7, 8, 9

The number of special classrooms needed for required music appreciation in grades 7, 8, 9 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in music appreciation - Grade 7 - 75
" " " " " - " 8 - 70
" " " " " - " 9 - 80
Instructional periods per week for each music appreciation class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for music appreciation - Grade 7 - 75 X 1 = 75
" " " " " " " - " 8 - 70 X 1 = 70
" " " " " " " - " 9 - 80 X 1 = 80
Total pupil periods per week for music appreciation - Grades 7, 8, 9 225

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 225 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for required music appreciation is:

$$\text{Number of rooms} = \frac{225}{25X27X0.88} = \frac{225}{594} = 0.37$$

Number of special classrooms needed for required music appreciation in grades 7, 8, 9 - 0.37

Elective Art Skill — Grades 7, 8, 9

The number of special classrooms needed for elective art skill for talented students is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in art skill - Grade 7 - 25
" " " " " - " 8 - 25
" " " " " - " 9 - 25
Instructional periods per week for each art skill class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for art skill - Grade 7 - 25 X 1 = 25
" " " " " " " - " 8 - 25 X 1 = 25
" " " " " " " - " 9 - 25 X 1 = 25
Total pupil periods per week for art skill - Grades 7, 8, 9 — 75

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 75 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for elective art skill for talented students in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{75}{25X27X0.88} = \frac{75}{594} = 0.12$$

Number of special classrooms needed for elective art skill for talented students in grades 7, 8, 9 - 0.12

Elective Instrumental Music — Grades 7, 8, 9

The number of special classrooms needed for elective instrumental music in grades 7, 8, 9 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 7, 8, 9

Estimated enrollment in instrumental music - Grade 7 - 25
" " " " " - " 8 - 25
" " " " " - " 9 - 25
Instructional periods per week for each instrumental music class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for instrumental music - Grade 7 - 25
" " " " " " " - " 8 - 25
" " " " " " " - " 9 - 25
Total pupil periods per week for instrumental music - Grades 7, 8, 9 — 75

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 75 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.12; 1-S = 0.88

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.88

Using the Anderson Formula, the number of rooms needed for elective instrumental music in grades 7, 8, 9 is:

$$\text{Number of rooms} = \frac{75}{25X27X0.88} = \frac{75}{594} = 0.12$$

Number of special classrooms needed for elective instrumental music in grades 7, 8, 9 - 0.12

Summary of Room Requirements

Grades 7, 8, 9

Standard Classrooms

English	-	1.6
Mathematics	-	1.6
Social Studies	-	1.6
Total	-	4.8

Special Classrooms

General Science	-	1.1	
Home Economics	-	0.54	
Industrial Arts	-	0.39	
Health	-	0.37	
Physical Education	-	0.37	
Art Appreciation	-	0.37	- 0.49
Art Skill	-	0.12	
Music Appreciation	-	0.37	- 0.49
Instrumental Music	-	0.12	

3. Number of Rooms Required in the Senior High School

Grades 10, 11, 12

The Anderson Formula, modified by substituting T. C. Holy's[1/] values for S, will be used to determine the room requirements for grades 10, 11, 12. Holy's values for S are as follows: S equals 0.15 for regular classrooms; and 0.30 for special classrooms in grades 10, 11, 12.

1/T. C. Holy, "What is Good Utilization of a School?", The School Executive,(November 1948).

The Anderson Formula is restated below:

$$\text{Number of Rooms} = \frac{\text{Pupil periods per week}}{\text{Desired average size of class X Total instructional periods per week X (1-S)}}$$

Standard Classrooms

Required English — Grades 10, 11, 12

The number of standard classrooms needed for required English in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula = Total pupil periods per week grades 10, 11, 12

Estimated enrollment in English - Grade 10 - 60
" " " " - " 11 - 70
" " " " - " 12 - 58
Instructional periods per week for each English class - 5

Using the same formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for English - Grade 10 - 60 X 5 = 300
" " " " " " - " 11 - 70 X 5 = 350
" " " " " " - " 12 - 58 X 5 = 290
Total pupil periods per week for English - Grades 10, 11, 12 940

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 940 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

This means that standard classrooms in grades 10, 11, 12 can be used 85 per cent of the time.

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.85

Using the Anderson Formula, with Holy's value of S for standard classrooms, the number of rooms needed for required English in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{940}{25X27X0.85} = \frac{940}{573.75} = 1.6$$

Number of standard classrooms needed for required English in grades 10, 11, 12 - 1.6

Required Social Studies Grades 10, 11, 12

Under social studies, World History should be taught in grade 10; United States History and Government in grade 11; and Problems of Democracy in grade 12.

The number of standard classrooms needed for required social studies in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in World history - Grade 10 - 60
" " " U. S. " and government - " 11 - 70
" " " Problems of democracy - " 12 - 58
Instructional periods per week for each social studies class - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for World history - Grade 10 - 60 X 5 = 300
" " " " " U. S. history and government- " 11 - 70 X 5 = 350
" " " " " Problems of democracy - " 12 - 58 X 5 = 290
Total pupil periods per week for social studies - Grades 10, 11, 12 940

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 940 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.85

Using the Anderson Formula, with Holy's value of S for standard classrooms, the number of rooms needed for required social studies in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{940}{25X27X0.85} = \frac{940}{573.75} = 1.6$$

Number of standard classrooms needed for required social studies in grades 10, 11, 12 - 1.6

Elective Mathematics Grades 10, 11, 12

Under mathematics, plane geometry should be taught in grade 10, algebra II in grade 11; and trigonometry and solid geometry in grade 12.

The number of standard classrooms needed for elective mathematics in grades 10, 11, 12 is as follows:

Estimated enrollment in plane geometry - Grade 10 - 25
" " " algebra II - " 11 - 25
" " " trigonometry and solid geometry - " 12 - 10

Since the estimated enrollment for trigonometry and solid geometry is 10, the desired average size of these classes must be 10. Therefore, the number of standard classrooms needed for trigonometry and solid geometry must be figured separately from plane geometry and algebra II.

The number of classrooms needed for plane geometry and algebra II can be determined in one process, since each has the same desired average size of class - 25.

Elective Plane Geometry and Algebra II Grades 10, 11

The number of standard classrooms needed for elective plane geometry and algebra II is as follows:

Numerator of Anderson Formula - Total pupil periods per week - plane geometry and algebra II

Estimated enrollment in plane geometry - Grade 10 - 25
" " " algebra II - " 11 - 25
Instructional periods per week for plane geometry and Algebra II - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for plane geometry - 25 X 5 = 125
" " " " " algebra II - 25 X 5 = 125
Total pupil periods per week for plane geometry and algebra II - 250

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 250 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.85

Using the Anderson Formula, with Holy's value of S for standard classrooms, the number of rooms needed for elective plane geometry and algebra II is:

$$\text{Number of rooms} = \frac{250}{25X27X0.85} = \frac{250}{573.75} = 0.43$$

Number of standard classrooms needed for elective plane geometry and algebra II in grades 10, 11 - 0.43

Elective Trigonometry and Solid Geometry Grade 12

The number of standard classrooms needed for elective trigonometry and solid geometry is as follows:

Numerator of Anderson Formula - Total pupil periods per week - trigonometry and solid geometry

Estimated enrollment - trigonometry and solid geometry - 10
Instructional periods per week for trigonometry and solid geometry - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for trigonometry and solid geometry - 10 X 5 = 50
Total pupil periods per week for trigonometry and solid geometry - 50

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 50 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 10
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 10 X 27 X 0.85

Using the Anderson Formula, with Holy's value of S for standard classrooms, the number of rooms needed for elective trigonometry and solid geometry is:

$$\text{Number of rooms} = \frac{50}{10X27X0.85} = \frac{50}{229.5} = 0.21$$

Number of standard classrooms needed for elective trigonometry and solid geometry - 0.21

Total number of standard classrooms needed for elective mathematics, grades 10, 11, 12:

Plane geometry and algebra II - 0.43 + trigonometry and solid geometry - 0.21 = Total mathematics - 0.64

Elective Foreign Languages Grades 10, 11, 12

Under foreign languages, French I and Latin I should be taught in grade 10; French I and Latin II in grade 11; and French II and Latin III in grade 12.

The number of standard classrooms needed for elective foreign languages is as follows:

Estimated enrollment in		French I -	Grade	10 - 15
"	"	" Latin I -	"	10 - 25
"	"	" French I -	"	11 - 35
"	"	" Latin II -	"	11 - 25
"	"	" French II-	"	12 - 25
"	"	" Latin III-	"	12 - 10

Since the estimated enrollments for French I in grade 10 and Latin III are 15 and 10 respectively, the desired average sizes of these classes must be 15 and 10. Therefore, the number of standard classrooms needed for French I, grade 10, and Latin III must be figured separately from the other foreign language subjects.

The number of classrooms needed for Latin I, French I, grade 11; and French II can be determined in one process, since each has the same desired average size of class - 25.

Elective Latin I; French I, grade 11; Latin II; French II

The number of standard classrooms needed for elective Latin I; French I, grade 11; Latin II and French II is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in Latin I - Grade 10 - 25
" " " French I- " 11 - 35
" " " Latin II- " 11 - 25
" " " French II- " 12 - 25
Instructional periods per week for each subject - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for Latin I - Grade 10 - 25 X 5 = 125
" " " " " French I - " 11 - 35 X 5 = 175
" " " " " Latin II - " 11 - 25 X 5 = 125
" " " " " French II - " 12 - 25 X 5 = 125
Total pupil periods per week 550

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 550 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.85

Using the Anderson Formula with Holy's value for S for standard classrooms, the number of rooms needed for elective Latin I; French I, grade 11; Latin II and French II is:

$$\text{Number of rooms} - \frac{550}{25X27X0.85} - \frac{550}{573.75} = 0.95$$

Number of standard classrooms needed for elective Latin I; French I grade 11; Latin II and French II - 0.95

Elective French I Grade 10

The number of standard classrooms needed for elective French I, grade 10 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - French I

Estimated enrollment in French I, grade 10 - 15
Instructional periods per week for French I, grade 10 - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for French I, grade 10 - 15 X 5 = 75
Total pupil periods per week for French I, grade 10 75

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 75 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 15
Total instructional periods per week - 27
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 15 X 27 X 0.85

Using the Anderson Formula with Holy's value for standard classrooms of S, the number of rooms needed for elective French I, grade 10 is:

$$\text{Number of rooms} = \frac{75}{15X27X0.85} = \frac{75}{344.25} = 0.21$$

Number of standard classrooms needed for elective French I, grade 10 - 0.21

Elective Latin III Grade 12

The number of standard classrooms needed for elective Latin III, grade 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in Latin III - grade 12 - 10
Instructional periods per week for Latin III - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for Latin III - Grade 12 - 10 X 5 = 50
Total pupil periods per week for Latin III - Grade 12 50

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 50 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 10
S = 0.15; 1-S = 0.85

By substitution of the above values:

Denominator of Anderson Formula - 10 X 27 X 0.85

Using the Anderson Formula with Holy's value of S for standard classrooms, the number of rooms needed for elective Latin III is:

$$\text{Number of rooms} = \frac{50}{10X27X0.85} = \frac{50}{229.5} = 0.21$$

Number of standard classrooms needed for elective Latin III, grade 12 - 0.21

The number of standard classrooms needed for elective foreign languages, grades 10, 11, 12:

Latin I; French II, grade 11; Latin II; French II - 0.95
+ French I, grade 10 - 0.21 + Latin III - 0.21 =
Total foreign languages - 1.37

Special Classrooms

Required Health — Grades 10, 11, 12

The number of special classrooms needed for required health in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in health - Grade 10 - 60
" " " " - " 11 - 70
" " " " - " 12 - 58
Instructional periods per week for each health class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for health - Grade 10 - 60 X 1 = 60
" " " " " " - " 11 - 70 X 1 = 70
" " " " " " - " 12 - 58 X 1 = 58
Total pupil periods per week for health - Grades 10, 11, 12 188

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 188 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

This means that special classrooms in grades 10, 11, 12 can be used only 70 per cent of the time.

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for required health in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{188}{25X27X0.70} = \frac{188}{472.5} = 0.39$$

Number of special classrooms needed for required health in grades 10, 11, 12 - 0.39

Required Physical Education Grades 10, 11, 12

The number of special classrooms (gymnasiums) needed for required physical education in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in physical education - Grade 10 - 60
" " " " " - " 11 - 70
" " " " " - " 12 - 58
Instructional periods per week for each physical education class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for physical education - Grade 10 - 60 X 1 = 60
" " " " " " " - " 11 - 70 X 1 = 70
" " " " " " " - " 12 - 58 X 1 = 58
Total pupil periods per week for physical education - Grades 10, 11, 12 188

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 188 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula, with Holy's value of S for special classrooms, the number of rooms needed for required physical education in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{188}{25X27X0.70} = \frac{188}{472.5} = 0.39$$

Number of special classrooms (gymnasiums) needed for required physical education - 0.39

Required Art Appreciation — Grades 10, 11, 12

The number of special classrooms needed for required art appreciation in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in art appreciation - Grade 10 - 60
" " " " " - " 11 - 70
" " " " " - " 12 - 58
Instructional periods per week for each art appreciation class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for art appreciation - Grade 10 - 60 X 1 = 60
" " " " " " " - " 11 - 70 X 1 = 70
" " " " " " " - " 12 - 58 X 1 = 58
Total pupil periods per week for art appreciation - Grades 10, 11, 12 — 188

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 188 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for required art appreciation in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{188}{25X27X0.70} = \frac{188}{472.5} = 0.39$$

Number of special classrooms needed for required art appreciation in grades 10, 11, 12 - 0.39

Elective Art Skill Grades 10, 11, 12

The number of special classrooms needed for elective art skill for talented students in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in art skill - Grade 10 - 10
" " " " " - " 11 - 10
" " " " " - " 12 - 10
Instructional periods per week for each art skill class - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for art skill - Grade 10 - 10 X 5 = 50
" " " " " " " - " 11 - 10 X 5 = 50
" " " " " " " - " 12 - 10 X 5 = 50
Total pupil periods per week for art skill - Grades 10, 11, 12 - 150

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 150 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 10 (Since the estimated enrollment is 10, the desired average size of class must be 10.)
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 10 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective art skill in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{150}{10X27X0.70} = \frac{150}{189} = 0.79$$

Number of special classrooms needed for elective art skill in grades 10, 11, 12 - 0.79

Total number of special classrooms needed for required art appreciation and elective art skill in grades 10, 11, 12:

Art appreciation - 0.39 + art skill - 0.79 = Total art - 1.18

Required Music Appreciation Grades 10, 11, 12

The number of special classrooms needed for required music appreciation is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in music appreciation - Grade 10 - 60
" " " " " - " 11 - 70
" " " " " - " 12 - 58
Instructional periods per week for each music appreciation class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for music appreciation - Grade 10 - 60 X 1 = 60
" " " " " " " - " 11 - 70 X 1 = 70
" " " " " " " - " 12 - 58 X 1 = 58
Total pupil periods per week for music appreciation - Grades 10, 11, 12 188

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 188 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for required music appreciation in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{188}{25X27X0.70} = \frac{188}{472.5} = 0.39$$

Number of special classrooms needed for required music appreciation in grades 10, 11, 12 - 0.39

Elective Instrumental Music Grades 10, 11, 12

The number of special classrooms needed for elective instrumental music in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week - grades 10, 11, 12

Estimated enrollment in instrumental music - Grade 10 - 10
" " " " " - " 11 - 10
" " " " " - " 12 - 10
Instructional periods per week for each instrumental music class - 1

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for instrumental music - Grade 10 - 10 X 1 = 10
" " " " " " " - " 11 - 10 X 1 = 10
" " " " " " " - " 12 - 10 X 1 = 10
Total pupil periods per week for instrumental music - Grades 10, 11, 12 30

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 30 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 10 (Since the estimated enrollment is 10, the desired average size of class must be 10.)
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

Denominator of Anderson Formula - 10 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective instrumental music in grades 10, 11, 12 is:

$$\text{Number of rooms} = \frac{30}{10X27X0.70} = 0.15$$

Number of special classrooms needed for instrumental music in grades 10, 11, 12 - 0.15

Total number of special classrooms needed for required music appreciation and elective instrumental music in grades 10, 11, 12:

Music appreciation - 0.39 + Instrumental music - 0.15 = Total music - 0.54

Elective Biology Grade 10

Biology should include three recitation periods per week for all students enrolled in the course; two laboratory periods for the non-college

preparatory group; and four laboratory periods per week for the college preparatory group.

The number of special classrooms, equipped for instructional and laboratory purposes, needed for elective biology is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in one class - 25
" " " college preparatory group - 15
" " " non-college preparatory group - 10
Instructional and laboratory periods per week for the college preparatory group - 7
Instructional and laboratory periods per week for the non-college preparatory group - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week - college preparatory group - 15 X 7 = 105
" " " " - non-college " " - 10 X 5 = 50
Total pupil periods per week for biology 155

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 155 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective biology in grade 10 is:

Number of rooms = $\frac{155}{25X27X0.70} = \frac{155}{472.5} = 0.32$

Number of special classrooms, equipped for instructional and laboratory purposes, needed for elective biology in grade 10 - 0.32

Elective Chemistry Grade 11

Chemistry should include three recitation periods per week for all students enrolled in the course; two laboratory periods for the non-college group; and four laboratory periods per week for the college preparatory group.

The number of special classrooms, equipped for instructional and laboratory purposes, needed for elective chemistry is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in one class - 35
" " " college preparatory group - 20
" " " non-college " " - 15
Instructional and laboratory periods per week for college preparatory group - 7
Instructional and laboratory periods per week for non-college preparatory group - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week - college preparatory group - 20 X 7 = 140
" " " " - non-college " " - 15 X 5 = 75
Total pupil periods per week for chemistry 215

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 215 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective chemistry in grade 11 is:

$$\text{Number of rooms} = \frac{215}{25X27X0.70} = \frac{215}{472.5} = 0.45$$

Number of special classrooms, equipped for instructional and laboratory purposes, needed for elective chemistry is 0.45 in grade 11.

Elective Physics Grade 12

Physics should include three recitation periods per week for all students enrolled in the course; two laboratory periods for the non-college group; and four laboratory periods per week for the college preparatory group.

The number of special classrooms, equipped for instructional and laboratory purposes, needed for elective physics is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in one class - 25
" " " college preparatory group - 20
" " " non-college " " - 5
Instructional and laboratory periods per week for the college preparatory group - 7
Instructional and laboratory periods per week for the non-college preparatory group - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week - college preparatory group - 20 X 7 = 140
" " " " - non-college " " - 5 X 5 = 25
Total pupil periods per week for physics 165

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 165 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective physics in grade 12 is:

$$\text{Number of rooms} = \frac{165}{25X27X0.70} = \frac{165}{472.5} = 0.34$$

Number of special classrooms, equipped for instructional and laboratory purposes, needed for elective physics in grade 12 - 0.34

Elective Home Economics I, II, III Grades 10, 11, 12

The number of special classrooms needed for elective home economics in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in home economics I - Grade 10 - 20
" " " " " II - " 11 - 20
" " " " " III- " 12 - 20
Instructional periods per week for each home economics class - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for home economics I - 20 X 5 = 100
" " " " " " " II - 20 X 5 = 100
" " " " " " " III- 20 X 5 = 100
Total pupil periods per week for home economics I, II, III 300

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 300 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the program of studies in chapter 3.

Desired average size of class - 20
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 20 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective home economics I, II, III is:

$$\text{Number of rooms} = \frac{300}{20X27X0.70} = \frac{300}{378} = 0.79$$

Number of special classrooms needed for elective home economics I, II, III in grades 10, 11, 12 - 0.79

Elective Shop Grades 10, 11, 12

The number of special classrooms needed for elective shop in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in shop - Grade 10 - 20
" " " " - " 11 - 20
" " " " - " 12 - 20
Instructional periods per week for each shop class - 5

Using the formula for obtaining pupil periods per week, the writer obtains the following:

Pupil periods per week for shop - Grade 10 - 20 X 5 = 100
" " " " " " - " 11 - 20 X 5 = 100
" " " " " " - " 12 - 20 X 5 = 100
Total pupil periods per week for shop - Grades 10, 11, 12 300

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 300 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 20
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 20 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective shop is:

$$\text{Number of rooms} = \frac{300}{20X27X0.70} = \frac{300}{378} = 0.79$$

Number of special classrooms needed for elective shop in grades 10, 11, 12 - 0.79.

Elective Bookkeeping I, II Grades 10, 11, 12

The number of special classrooms needed for elective bookkeeping in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in Bookkeeping I - Grade 10 - 20
" " " " I - " 11 - 20
" " " " II- " 11 - 20
" " " " II- " 12 - 20
Instructional periods per week for each bookkeeping class - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for bookkeeping I - Grade 10 - 20 X 5 = 100
" " " " " " I - " 11 - 20 X 5 = 100
" " " " " " II- " 11 - 20 X 5 = 100
" " " " " " II- " 12 - 20 X 5 = 100
Total pupil periods per week for bookkeeping I, II - Grades 10, 11, 12 400

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 400 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 20 (Since the estimated enrollment is 20 per bookkeeping class, the desired average size of class must be the same.)
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 20 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective bookkeeping I, II is:

$$\text{Number of rooms} = \frac{400}{20X27X0.70} = \frac{400}{378} = 1.05$$

Number of special classrooms needed for elective bookkeeping I, II in grades 10, 11, 12 - 1.05

Elective Typewriting I, II, III Grades 10, 11, 12

The number of special classrooms needed for elective typewriting I, II, III in grades 10, 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in typewriting I - Grade 10 - 35
" " " " I - " 11 - 35
" " " " I - " 12 - 25
" " " " II- " 11 - 25
" " " " II- " 12 - 25
" " " " III " 12 - 25
Instructional periods per week for each typewriting class - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for typewriting I - Grade 10 - 35 X 5 = 175
" " " " " " I - " 11 - 35 X 5 = 175
" " " " " " I - " 12 - 25 X 5 = 125
" " " " " " II - " 11 - 25 X 5 = 125
" " " " " " II - " 12 - 25 X 5 = 125
" " " " " " III- " 12 - 25 X 5 = 125
Total pupil periods per week for typewriting I, II, III 850

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 850 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the Program of Studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value of S for special classrooms, the number of rooms needed for elective typewriting I, II, III is:

$$\text{Number of rooms} = \frac{850}{25X27X0.70} = \frac{850}{472.5} = 1.79$$

Number of special classrooms needed for elective typewriting I, II, III - 1.79

Elective Stenography I, II Grades 11, 12

The number of special classrooms needed for stenography I, II in grades 11, 12 is as follows:

Numerator of Anderson Formula - Total pupil periods per week

Estimated enrollment in stenography I - 25
" " " " II - 25
Instructional periods per week for each stenography class - 5

Using the formula for obtaining pupil periods per week:

Pupil periods per week for stenography I - 25 X 5 = 125
" " " " " " II - 25 X 5 = 125
Total pupil periods per week for stenography I, II 250

By substitution of the above total pupil periods per week:

Numerator of Anderson Formula - 250 pupil periods per week

Denominator of Anderson Formula - Desired average size of class X Total instructional periods per week X (1-S)

The following values except S were taken from the program of studies in chapter 3.

Desired average size of class - 25
Total instructional periods per week - 27
S = 0.30; 1-S = 0.70

By substitution of the above values:

Denominator of Anderson Formula - 25 X 27 X 0.70

Using the Anderson Formula with Holy's value for S for special classrooms, the number of rooms needed for elective stenography I, II is:

$$\text{Number of rooms} = \frac{250}{25X27X0.70} = \frac{250}{472.5} = 0.52$$

Number of special classrooms needed for elective stenography I, II - 0.52.

Bookkeeping and stenography can be taught in the same rooms.

Total number of special classrooms needed for elective bookkeeping I, II and stenography I, II:

Bookkeeping I and II - 1.05 + Stenography I and II - 0.52 =
Total Bookkeeping - Stenography - 1.57

4. Summary of Room Requirements

Standard Classrooms

Junior High School - Grades 7, 8, 9		Senior High School - Grades 10, 11, 12	
English	1.6	English	1.6
Mathematics	1.6	Social Studies	1.6
Social Studies	1.6	Mathematics	0.64
Total	4.8	Foreign Languages	1.37
		Total	5.21

The total number of standard classrooms needed for junior high school (grades 7, 8, 9) is five. Three of the five classrooms for grades 7, 8, 9 might have chalkboards on the front and side walls, and display boards on the back wall for English and mathematics classes; and two of the rooms would have chalkboards on the front wall and display boards on the side and back walls for social studies classes.

The seats and desks in these rooms should be for early adolescents from 12 - 14 years of age.

The total number of standard classrooms needed for senior high school (grades 10, 11, 12) is six. Three of the six classrooms for grades 10, 11, 12 might have chalkboards on the front and side walls and display boards on the back wall for foreign languages and mathematics classes; and three of the rooms would have chalkboards on the front wall and display boards on the side and back walls for English and social studies classes.

The seats and desks in these rooms should be for older students, 15 - 17 years of age.

Special Classrooms

Grades 7, 8, 9		Grades 10, 11, 12	
General Science	1.1	Biology	0.32
Home Economics	0.54	Chemistry	0.45
Industrial Arts	0.39	Physics	0.34
Health	0.37	Home Economics	0.79
Physical Education	0.37	Shop	0.79
Art	0.49	Health	0.39
Music	0.49	Physical Education	0.39
		Art	1.18
		Music	0.54

Commercial Subjects

Bookkeeping	1.05
Stenography	0.52
Typewriting	1.79

On the basis of this summary of needs for special classrooms, the writer recommends the following:

Room	Junior High School Room Requirements	Senior High School Room Requirements	Total	Number of Rooms Recommended
1. Health	0.37	0.39	0.76	(See below)
2. General Science	1.1		1.1	1
3. Biology		0.32	0.32	1
		Total	2.18	2

Use the remaining space in the biology room for a part of the health requirements as an economy measure.

4. Chemistry		0.45	0.45)	1
5. Physics		0.34	0.34)	
		Total	0.79	

Build and equip one room to accomodate chemistry and physics. Use the remaining space for the remainder of health and general science classes.

6. Home Economics	0.54	0.79	1.33	2

Construct one room for foods and one room for clothing which can be used for other types of home economics. The remaining space can be used for growth.

Room	Junior High School Room Requirements	Senior High School Room Requirements	Total	Number of Rooms Recommended
7. Industrial Arts	0.39	0.79	1.18	2

The writer recommends one general shop for junior high school and one general shop for senior high school use. The remaining space allows for growth in electing the subject.

8. Gymnasium	0.37	0.39	0.76	1

The gymnasium should be so constructed that it can be divided by a partition for use by boys and girls separately.

9. Art	0.49	1.18	1.67	2

The writer recommends the construction of two art rooms to allow for growth in electing the subject.

10. Music	0.49	0.54	1.03	(See below)

The writer recommends the use of the auditorium for music.

11. Bookkeeping		1.05	1.05)	2
12. Stenography		0.52	0.52)	
		Total	1.57	

The writer recommends the construction of two rooms equipped for the teaching of bookkeeping. Stenography can be taught in these rooms. The remaining space allows for growth in electing either or both subjects.

13. Typewriting			1.79	2

The writer recommends the construction of two rooms to provide opportunity for all students to study at least one year of typewriting.

14. Activities

The writer recommends that guidance, home room and club activities in grades 7 - 12 be held in classrooms in non-instructional periods.

15. Auditorium

The writer recommends that an auditorium be constructed to seat 500. It can be used for assembly programs for the entire enrollment and for community purposes.

16. Library

It is recommended by the writer that one general library be constructed to seat 60 students. This figure is based upon the recommendation of the American Association of School Administrators.[1/]

17. Gymnasium

The writer recommends the construction of a gymnasium of 76 by 96 feet to accommodate a regulation high school basketball court of 50 by 84 feet, adequate safety zones, and folding bleachers to seat 500 spectators. This recommendation meets with the approval of the American Association of School Administrators.[2/]

Study periods can be held in the library, cafeteria and classrooms, when otherwise not in use.

Actually 4.8 standard classrooms are needed for grades 7, 8, 9. A fraction of a classroom cannot be constructed; therefore, five standard classrooms should be constructed. The remaining space can be used for possible growth in enrollment in grades 7, 8, 9.

Actually 5.21 standard classrooms are needed for grades 10, 11, 12. A fraction of a classroom cannot be constructed; therefore, six standard classrooms should be constructed. The remaining room can be used for possible growth in enrollment in grades 10, 11, 12.

1/A. A. S. A., American School Buildings, op. cit., p. 100.
2/Ibid. p. 105.

Although it is not advisable to use junior-senior high school classrooms interchangeably because of the differences in the sizes of the furniture and equipment, special classrooms could be used interchangeably by junior and senior high school students to save the expense of providing special equipment.

It is recommended by the writer that one typing room be constructed ten feet longer than the other to make room for machines used in teaching office practice in grades 10, 11, 12.

Each science laboratory should be equipped with movable furniture to provide additional floor space when it is needed. This would permit the use of a cot in teaching home nursing in health classes.

The next step is to determine the sizes of the rooms. Before doing this, it will be necessary to determine the maximum size of the class to be accommodated in each room. The maximum size of class depends upon the average size of class desired by the school.

Homer W. Anderson[1/] has derived a formula for determining the maximum size of class in a junior high school. It is as follows:

$$\text{Capacity of Room} = 1.00 - \frac{\text{Desired average size of class}}{\text{the allowance for schedule making}}$$

The allowances for schedule making in a junior high school (grades 7, 8, 9) the sizes of North Smithfield's are as follows:

	Academic Classrooms	Special Rooms
Small (Schools) -	0.20	0.20

This means that the average class in small junior high schools is 80 per cent of the capacity of the room, requiring an allowance of 20 per cent for the schedule.

1/H. W. Anderson, op. cit. p. 34.

Anderson uses S to designate the allowance for schedule making.

T. C. Holy[1] recommends the following allowances for schedule making for senior high schools the size of North Smithfield's.

Small High Schools	Academic Classrooms	Special Classrooms
	0.30	0.45

This means that the average class in small senior high school standard classrooms is 70 per cent of the capacity of the room, requiring an allowance of 30 per cent for schedule making; and the average class in small senior high school special classrooms is 55 per cent of the capacity of the room, requiring an allowance of 45 per cent for schedule making.

The Anderson formula for determining the maximum size of class in a junior high school will also be used for determining the maximum size of each senior high school class, with but one change. T. C. Holy's allowances for schedule making (s) will be substituted for Anderson's.

5. Maximum Pupil Capacity of Junior High School Classrooms

According to Anderson (Table 14)[2] the maximum pupil capacity of each room in small junior high schools in which the desired average size of class is 25, will be 31; and 25 in rooms where the desired average size of class is 20. Since Anderson has determined maximum pupil capacities in Table 14, there is no necessity for making any computations for the junior high school. Only those for the senior high school have to be made.

1/T. C. Holy, "What is Good Utilization of a School?" Bureau of Educational Research, Ohio State University, Columbus, Ohio, The School Executive, (November, 1948).

2/H. W. Anderson, op. cit. p. 38.

Maximum Pupil Capacities of Senior High School

Standard Classrooms Grades 10, 11, 12

The maximum pupil capacity of each standard classroom in grades 10, 11, 12, for which the desired average size of class is 25, can be computed in one process. The computations are as follows:

Desired average size of class - 25

Allowance for schedule making (S) - 0.30

Using the Anderson formula for computing the maximum size of class using T. C. Holy's allowance for schedule making when standard classrooms are involved, the maximum pupil capacity is:

$$\text{Capacity of Room} = \frac{\text{Desired average size of class}}{1.00 - \text{Allowance for schedule making}}$$

$$\text{Capacity of Room} = \frac{25}{1. - 0.30} = \frac{25}{0.70} = 36$$

The maximum pupil capacity of each standard classroom in grades 10, 11, 12, for which the desired average size of class is 25, is 36.

6. Maximum Pupil Capacity of Special Classrooms

Grades 10, 11, 12

The maximum pupil capacity of each special classroom in grades 10, 11, 12, for which the desired average size of class is 25, can be computed in one process. The computations are as follows:

Desired average size of class - 25

Allowance for schedule making - 0.45

Using the Anderson formula for computing the maximum size of class with T. C. Holy's allowance for schedule making, when special classrooms are involved, the maximum pupil capacity is:

$$\text{Capacity of Room} = \frac{\text{Desired average size of class}}{1 - \text{allowance for schedule making}}$$

$$\text{Capacity of Room} = \frac{25}{1 - 0.45} = \frac{25}{0.55} = 45$$

The maximum pupil capacity of each special classroom in grades 10, 11, 12, for which the desired average size of class is 25, is 45.

The maximum pupil capacity of each special classroom in grades 10, 11, 12, for which the desired average size of class is 20 (home economics and industrial arts) can be computed in one process. The computations are as follows:

Desired average size of class - 20

Allowance for schedule making - 0.45

Using the Anderson formula for computing the maximum size of class with T. C. Holy's allowance for schedule making, when special classrooms are involved, the maximum pupil capacity is:

$$\text{Capacity of Room} = \frac{\text{Desired average size of class}}{1.00 - \text{allowance for schedule making}}$$

$$\text{Capacity of Room} = \frac{20}{1 - 0.45} = \frac{20}{0.55} = 36$$

The maximum pupil capacity of each special classroom in grades 10, 11, 12, for which the desired average size of class is 20, is 36.

Library

No computations are necessary for determining the maximum pupil capacity of the library. It is equal to the desired average size of class which is 60. This figure is based upon the following recommendation of the American Association of School Administrators.[1/]

1/A. A. S. A., American School Buildings, op. cit., p. 112.

"In the average situation without study halls, the library should seat about a sixth of the high-school enrollment, up to sixty or seventy-five pupils."

7. Summary of Pupil Capacity of Junior High School Classrooms

Type of Classroom	Desired Average Size of Class	Maximum Pupil Capacity of Room
Standard	25	31
Special	25	31
Special	20	25

Summary of Pupil Capacity of Senior High School Classrooms

Type of Classroom	Desired Average Size of Class	Maximum Pupil Capacity of Room
Standard	25	36
Special	25	45
Special	20	36
Library	60	60

Sizes of Rooms

The recommended size of the floor space of each classroom is equal to the product of the maximum pupil capacity and the recommended area per pupil in each teaching unit.

The recommended area per pupil in each teaching unit has been obtained from the following table compiled by Vernon L. Nickel.[1/]

1/Vernon L. Nickel, A Guide for Planning School Buildings, Circular Series A, No. 35 Superintendent of Public Instruction, State of Illinois, p. 7.

The areas per pupil found in the table compare favorably with recommendations of Engelhardt, Engelhardt and Leggett,[1] American Association of School Administrators,[2] and several high school principals with whom the writer has discussed the matter.

The Commissioner of Education of Rhode Island has suggested that the writer follow the recommendations of the above authorities in determining the area per pupil in each teaching unit.

The recommended areas per pupil for the various units are given below:

Table 3

Areas Per Pupil

Subject	Square Feet
Social Studies	25 - 30
Mathematics	20 - 25
English	20 - 25
Science Laboratories	35 - 40
Commercial	20 - 25
Art	25 - 35
Home Economics	35 - 45
Shop	50 plus
General Rooms	
Auditorium	6 - 7
Cafeteria	10 - 15
Gymnasium	50 - 100
Library	25 - 30

The recommended width of each room, except the auditorium, gymnasium and library is 23 feet. This figure has been used recently by Engelhardt, Engelhardt and Leggett in planning secondary school classrooms.[3]

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, Reinhold Publishing Corporation, New York 18, N. Y., 1949.

2/A. A. S. A., American School Buildings, op. cit.

3/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., pp. 85-86.

The writer has fixed the area per pupil in each standard classroom at 25 square feet. The American Association of School Administrators recommends a floor area of 25 - 30 square feet per pupil for academic classrooms.[1/] Therefore, only the length of each classroom must be determined. The computations are as follows:

The following formula for determining the lengths of classrooms is proposed by the writer:

$$\text{Length of Room} = \frac{\text{Maximum Pupil Capacity X Area per Pupil}}{\text{Width of Room}}$$

8. Lengths of Classrooms in Junior High School

Standard Classrooms Grades 7, 8, 9

Maximum pupil capacity for each standard classroom - 31

Area per pupil in each standard classroom - 25 square feet.

Width of each standard classroom - 23 feet.

Using the above formula, the length of each standard classroom in grades 7, 8, 9 is:

$$\text{Length of room} = \frac{31X25}{23} = \frac{775}{23} = 33 \text{ feet}$$

Length of each standard classroom in grades 7, 8, 9 - 33 feet.

Special Classrooms

General Science One Room Grades 7, 8, 9

Maximum pupil capacity of general science room - 31

Area per pupil in general science room - 35 square feet.

Width of general science room - 23 feet.

1/A. A. S. A., American School Buildings, op. cit., pp. 93-94.

Using the formula for determining the length of a classroom, the length of the general science room is:

$$\text{Length of room} = \frac{31X35}{23} = \frac{1085}{23} = 47 \text{ feet}$$

Length of general science room for grades 7, 8, 9 - 47 feet.

Industrial Arts One Room Grades 7, 8, 9

Maximum pupil capacity of industrial arts room - 25

Area per pupil in industrial arts room - 50 square feet.

Width of Industrial arts room - 23 feet.

Using the formula for determining the length of a classroom, the length of the industrial arts room for grades 7, 8, 9 is:

$$\text{Length of room} = \frac{25X50}{23} = \frac{1250}{23} = 54 \text{ feet}$$

Length of industrial arts room for grades 7, 8, 9 - 54 feet.

The lengths of the art and home economics classrooms and the library will be computed later when determining the lengths of senior high classrooms; since these rooms are to be used jointly by junior and senior high school students.

9. Lengths of Classrooms in Senior High School

Standard Classrooms Grades 10, 11, 12

Maximum pupil capacity for each standard classroom - 36

Area per pupil in each standard classroom - 25 square feet.

Width of each standard classroom - 23 feet.

Using the formula for determining the length of a classroom, the length of each standard classroom in grades 10, 11, 12 is:

$$\text{Length of room} = \frac{36X25}{23} = \frac{900}{23} = 39 \text{ feet}$$

Length of each standard classroom in grades 10, 11, 12 - 39 feet.

Special Classrooms — Grades 10, 11, 12

Biology — One Room — Grade 10

Maximum pupil capacity of biology room - 45

Area per pupil in the biology room - 35 square feet.

Width of biology room - 23 feet.

Using the formula for determining the length of a classroom, the length of the biology room is:

$$\text{Length of room} = \frac{45X35}{23} = \frac{1575}{23} = 68 \text{ feet}$$

Length of biology room - 68 feet.

Chemistry and Physics — One Room — Grades 11, 12

Maximum pupil capacity of chemistry - physics room - 45

Area per pupil in the chemistry - physics room - 35 square feet.

Width of the chemistry - physics room - 23 feet.

Using the formula for determining the length of a classroom, the length of the chemistry - physics room is:

$$\text{Length of room} = \frac{45X35}{23} = \frac{1575}{23} = 68 \text{ feet}$$

Length of chemistry - physics room - 68 feet.

Home Economics — Two Rooms — Grades 7 - 12

Maximum pupil capacity of each home economics room - 36

Area per pupil of each home economics room - 35 square feet.

Width of each home economics room - 23 feet.

Using the formula for determining the length of a room, the length of each home economics room is:

$$\text{Length of room} = \frac{36X35}{23} = \frac{1260}{23} = 54 \text{ feet}$$

Length of each home economics room - 54 feet.

Shop One Room Grades 10, 11, 12

Maximum pupil capacity of shop - 36

Area per pupil of the shop - 50 square feet.

Width of the shop - 23 feet.

Using the formula for determining the length of a classroom, the length of the shop is:

$$\text{Length of room} = \frac{36X50}{23} = \frac{1800}{23} = 78 \text{ feet}$$

Length of shop - 78 feet.

Art Two Rooms Grades 7 - 12

Maximum pupil capacity of each art room - 45

Area per pupil of each art room - 30 square feet.

Width of each art room - 23 feet.

Using the formula for determining the length of a classroom, the length of each art room is:

$$\text{Length of room} = \frac{45X30}{23} = \frac{1350}{23} = 58 \text{ feet}$$

Length of each art room - 58 feet.

Bookkeeping and Stenography Two Rooms Grades 10, 11, 12

Maximum pupil capacity of each bookkeeping-stenography room - 45

Area per pupil of each bookkeeping - stenography room - 25 square feet.

Using the formula for determining the length of a classroom, the length of each commercial room is:

$$\text{Length of room} = \frac{45X25}{23} = \frac{1125}{23} = 48 \text{ feet}$$

Length of each bookkeeping - stenography room - 48 feet.

Typewriting Two Rooms Grades 10, 11, 12

Maximum pupil capacity of each typewriting room - 45

Area per pupil of each typewriting room - 25 square feet.

Width of each typewriting room - 23 feet.

Using the formula for determining the length of a classroom, the length of each typewriting room is:

$$\text{Length of room} = \frac{45X25}{23} = \frac{1125}{23} = 48 \text{ feet}$$

Engelhardt, Engelhardt, and Leggett[1] say, "Ten feet of additional space at the rear of the typewriting room should be provided for business machines."

The length of at least one typewriting room should be increased from 48 to 58 feet to provide space for business machines.

Length of one typewriting room - 58 feet.

Length of second typewriting room - 48 feet.

Library One General Library Grades 7 - 12

Maximum pupil capacity of library - 60

Area per pupil for library - 25 square feet.

Width of library - 36 feet. (This figure has been used recently by Engelhardt, Engelhardt, and Leggett.[2])

Using the formula for determining the length of a classroom, the length of the library seating area is:

$$\text{Length of room} = \frac{60X25}{36} = \frac{1500}{36} = 41 \text{ feet}$$

Length of library seating area - 41 feet.

1/ N. L. Engelhardt, N. L. Engelhardt, Jr., and Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 171.

2/ Ibid, p. 86.

Book Storage in Library

The writer recommends that 6 additional feet of stack space, the same width as the library, be provided at one end of the library for storage of books.

The American Association of School Administrators has the following to say relative to the storage of books in the library:[1/]

> "One linear foot of adjustable bookshelving for each pupil enrolled should be built into walls and alcoves. Bookcase height should not exceed 5 feet 6 inches in elementary schools and 7 feet in secondary schools. The bottom shelf should be from 4 to 8 inches from the floor. It is desirable to have all bottom shelves slightly slanted so that titles can be read from a standing position. Each section of shelving should be 3 feet long and 8 inches deep, except that a limited amount of shelving should be 10 or 12 inches deep. There should be no projecting trim or facing. All shelving should be vertically adjustable. Special bookcase sections with slanting shelves should be designed for display of large books and picture books, and similar sections of slanting shelves are needed for magazines."

The above recommendations should be followed in the construction of the library.

By adding 6 additional feet to the length of the library, a total of 12 bookcases, each 6 feet long and each having 6 shelves, can be installed to meet the above recommendations. This will provide enough space for storage of books for the school's total enrollment of 400, and for new books that may be added to the library.

Therefore, the total length of the library is 47 feet.

The writer also recommends the construction of a storage and workroom 23 by 10 feet on the other end of the library. More is said about this room in a later paragraph.

1/A. A. S. A., American School Buildings, op. cit., pp. 112-113.

Gymnasium — One Gymnasium — Grades 7 - 12

The recommended dimensions of the gymnasium (76 X 96 feet) have been previously stated by the writer.

Auditorium

The auditorium should have a total seating area of 3,000 square feet, allowing 6 square feet per pupil and a total seating capacity of 500 to satisfy the needs of the school and community.

Based on the preceding computations the following is a schedule of number of rooms, desired average size of class, maximum pupil capacity per room, and size of each room.

10. Schedule of Junior and Senior High School Rooms

Classrooms	Number of Rooms	Desired Average Size of Class	Maximum Pupil Capacity per Room	Size of Room
Standard				
Junior High	5	25	31	23' X 33'
Senior High	6	25	36	23' X 39'
Special				
General Science	1	25	31	23' X 47'
Biology	1	25	45	23' X 68'
Chemistry) Physics)	1	25	45	23' X 68'
Home Economics				
1. Foods Room	1	20	36	23' X 54'
2. Clothing Room	1	20	36	23' X 54'
Industrial Arts				
1. Junior High	1	20	25	23' X 54'
2. Senior High	1	20	36	23' X 78'
Art	2	25	45	23' X 58'
Bookkeeping) Stenography)	2	25	45	23' X 48'
Typewriting	1	25	45	23' X 48'
Typewriting and Business Machines	1	25	45	23' X 58'
General Rooms				
Library	1	60	60	36' X 47'
Gymnasium	1		Classes & Games	76' X 96'
Auditorium	1	(Seating area)	500	3,000 sq. feet (50' X 60')

The procedure from hereon will include a description of room specifications and a summary of room data.

Classroom Planning:-- The tendency in the past has been to plan uniform classrooms regardless of the subject matter to be taught. The underlying principle in classroom planning is that the space should be planned to aid the educational program. The size of the room, its general layout, the equipment and other facilities must be useful to the requirements of the curriculum. Regarding the present day trend in classroom design Engelhardt, Engelhardt and Leggett have this to say.[1/]

> "There will be an ever increasing stress upon the desirability of placing students in rooms which are comfortable, informal, flexible and inspirational rooms which reflect the atmosphere of the subject to be taught, rooms which invite purposeful activity and creativeness, and rooms that inspire student interest and promote the natural desire to enter into the great adventure of searching for information, mastering certain vital segments of learning, thinking through genuine problems, and imparting new found information to others."

All classrooms should have adequate lighting. The American Association of School Administrators[2/] contends that,

"Classrooms, including libraries, shops, lecture rooms, and laboratories should have 30 foot candles maintained in service."

Floors should be quiet, safe, durable and easy to keep clean. Ceilings should be made of sound absorbing materials. Walls should be painted with light colored paints and there should be no glare from these walls.

Classroom doors should open outward and should be recessed so as not to endanger students using the corridors.

1/ N. L. Engelhardt, N. L. Engelhardt, Jr., and Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 100.

2/A. A. S. A., American School Buildings, op. cit., p. 224.

Engelhardt, Engelhardt and Leggett[1] say,

"Each classroom should be provided with two exits, each no more than 100 feet from corridor exits."

These provisions are for safety.

All classrooms should be equipped with electrical outlets for audio-visual aids equipment.

Chalkboards should be smooth, even, non-reflective surfaces.

Nickel[2] says,

"Each classroom should have a minimum of twenty linear feet of chalkboard space. Chalkboards should be 42 inches wide and should be 32 inches from the floor."

Each classroom should have adequate storage space for books, supplies, teaching equipment and students' materials.

The Educational Service Associates[3] say,

"Classrooms should be equipped with movable furniture to suit the ages of the pupils using it and the flexibility of room arrangement."

Each classroom should have sufficient tackboard and display board space. See recommendations on Page 116.

Nickel[4] says,

"The height of the ceiling of a regular classroom should not be less than 11 feet nor more than 12 feet and no regular classroom should be less than 22 feet wide."

1/N. L. Engelhardt, N. L. Engelhardt, and Stanton Leggett, Planning Secondary School Buildings, op. cit. p. 197.
2/Vernon L. Nickel, op. cit. p. 17.
3/The Educational Service Associates, "Medway Survey Report," Associate Directors, Ralph D. McLeary, Concord, Mass., Dr. William C. Kavasceus, Boston University, February 15, 1950, p.71.
4/Vernon L. Nickel, op. cit. pp. 8-9.

Mathematics Classrooms:--The writer recommends the installation of chalkboards on the front and side walls of these classrooms and display boards on the rear walls. There is need for work benches for making and operating models in grades 7, 8, 9 and cabinets for displays. There is also need for book cases where source books and the latest publications of interest to mathematics students can be kept.

Social Studies Classrooms:--These rooms need less chalkboard space and more display board space. The writer recommends the installation of chalkboards on the front wall and display boards on the side and rear walls of these rooms.

In addition, the writer recommends that social studies rooms each have a large table for group projects and map work. They need work areas for building model communities and other projects. Space is needed for a library of books, periodicals, newspapers, and storage of students' papers, maps, globes and other visual aids. These rooms need electrical outlets for audio-visual aids equipment.

English Classrooms:--English classrooms need plenty of display board space especially for grades 10, 11, 12. Book cases are needed in greater quantity in these rooms. These rooms need electrical outlets for audio-visual aids equipment.

The English and social studies classrooms should be located near the school library.

Foreign Languages Classrooms:--These rooms need display board space and book cases for source materials and periodicals. The writer recommends the installation of chalkboards on the front and side walls and display board space on the rear walls of these classrooms.

Industrial Arts Rooms:--North Smithfield should have two general shops to provide adequate facilities for its industrial arts program. These general shops should include equipment which will provide for instruction in woodworking, metalworking, electricity, radio, and mechanical drawing.

These rooms should be located on the ground floor and should provide easy access to the service drives. They should be located in a wing of the building where the noise of machines and pounding will not interfere with other school activities. The outside wall space should be window area, and there should be sufficient artificial lighting.

The Educational Service Associates[1/] say,

"The equipment should include a tool room, an instructor's office, a small planning area, lockers, toilet facilities, supply closets and a paint room."

Science Rooms:--Our school should have three combination recitation and laboratory science rooms, one for general science, one for biology, and one for chemistry and physics. The first room should be equipped for the teaching of general science; the second for biology and health; and the third for chemistry and physics.

These rooms should have facilities for demonstration, lecture and recitation, experiments and audio-visual aids. Laboratory tables should be placed at the rear of the rooms. Each room should have a teacher's demonstration table located at the front of the room before the space for student tablet arm chairs.

Laboratory and demonstration tables should have running water, gas, electricity and other fittings necessary for conducting experiments in general science, biology, chemistry and physics.

1/The Educational Service Associates, op. cit., p. 74.

A laboratory storage and preparation room 23 X 8 feet located between the biology laboratory and the chemistry - physics room should be provided. This room should be equipped with storage cabinets for materials used in experiments.

Adequate natural and artificial ventilation is a necessity in these rooms. There should be a hooded area with proper ventilation for the chemistry room.

Laboratory and demonstration tables should be equipped with acid resisting tops, storage space for laboratory equipment, and drawers for storage of books and other materials. Stools should be provided for seating equipment.

Each laboratory should be equipped with dark shades and suitable electrical outlets for projectors.

Home Economics Rooms:— There should be two rooms provided for the teaching of home economics, one for foods, the other for clothing. The American Association of School Administrators[1/] has the following to say relative to the space requirements needed for home economics:

> "The two room department in which each room is equipped for a different combination of activities is widely used. One room is usually equipped for foods and for laundering, with storage for equipment and illustrative material to teach home management. The other is furnished with equipment for the study of clothing, home care of the sick, home furnishing and child development. Consumer buying and personal and family relationships may be taught in either or both rooms."

The writer recommends that the above be followed.

1/A. A. S. A., American School Buildings, op. cit., p. 97.

Because the desired average size of each home economics class is 20, the writer recommends the installation of five kitchen units in the foods room, each unit equipped for four students.[1] The clothing room should have sewing machines, cutting tables and other dressmaking facilities.

Each room should be equipped with chalkboard and display board.

A sufficient quantity of electrical outlets should be installed in each of these rooms. Hot and cold water is essential too.

Business Education Rooms:-- There should be four rooms provided for the teaching of business education subjects. Two rooms should be devoted to typewriting and business machine training. The other two rooms should be used for bookkeeping and stenography. Adequate furniture for bookkeeping classes should be provided which can be used by stenography classes. There should be a work counter, sink and running water in each typewriting room.

In designing these rooms, electrical outlets, filing cases, chalkboard and tackboard space should be provided.

Art Rooms:-- The writer recommends the construction of two art rooms to meet the following recommendations of the American Association of School Administrators.[2]

> "It is often desirable to locate art rooms convenient to the homemaking unit and general shop. About 30 - 35 square feet of net floor space per pupil is needed exclusive of storage. Special consideration should be given to lighting and decoration for high levels of illumination, control of shades, and suitability for color discrimination. Windows should face north.

1/A. A. S. A., American School Buildings, op. cit., p. 98.
2/Ibid., p. 100.

> This department should be provided with an abundance of storage shelves, drawers and cupboards, exhibit counters, work counters, filing cabinets, picture files, folio trays, unfinished work storage, cubicles, bookshelves, work sink with hot and cold water, large tackboard area, small amount of chalkboard, drawing tables, large work tables, easels, model stands, provision for visual aids, spray outfits, and paper cutters. Potters' wheels, kilns, and other provisions for clay modeling are desirable. The art room should be planned as an informal working laboratory rather than as a conventional classroom. Provision should be made for display of art objects both inside and outside the classroom.
>
> A number of work centers should be set up in the art room such as: a clay center, a wood center, a metal center, and a weaving center. Storage spaces should be located near the respective activities. There should be a large bulletin board on which murals could be executed or comprehensive displays arranged. Movable service units, on which various kinds of supplies and equipment can be wheeled to the spot where needed, are useful."

Music Room:-- The auditorium is very suitable for the teaching of music. It should be equipped with electrical outlets for use of a phonograph, radio, and projectors.

Library:-- The school library should be located where students in English, social studies, and study classes can have easy access to it. Relative to the size of the library, the American Association of School Administrators[1/] recommends an area large enough to seat about one-sixth of the school's enrollment. The writer, therefore, recommends a library capable of seating 60 pupils, with 25 square feet of floor area per pupil being allowed.

The library should have shelves for storing at least 2,000 volumes as well as periodicals and other reading materials. Engelhardt,

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1/A. A. S. A., American School Buildings, op. cit., p. 105.

Engelhardt, and Leggett[1] say,

"A minimum of five books per pupil is essential in any school library."

For a school with a possible enrollment of 400 students, this would require storage space for 2,000 volumes. Storage space has been provided for this number of volumes and for those that may be acquired in the future with growth of the school.

The library should have sound absorbing materials on the floor, walls, and ceiling as it is desirable that the library be quiet at all times. This room should be well lighted and attractively decorated. It should be equipped with student tables preferably 29 to 30 inches high, 34 to 36 inches wide, 5 to 7 feet 6 inches long and of a light, natural.[2]

Adjacent to the library there should be a storage and work room 23 by 10 feet equipped with shelves, running water, sink and electricity. This room can be used for storage of audio-visual aids equipment and new books that may be added to the library.

Gymnasium:-- North Smithfield should have a junior-senior high school building equipped with a suitable gymnasium for physical education classes, intra-mural games, inter-school basketball, and for community use.

The floor space should be 76 by 96 feet as previously stated by the writer. This space would be large enough to provide two basketball courts of 35 by 60 feet across separated by a movable partition made of canvas. There would be sufficient clearance on each side of the court. However, it is recommended by the writer that a regulation high school basketball

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 126.
2/Ibid., p. 126.

of 50 by 84 feet, adequate safety zones, and folding bleachers for 500 spectators be provided. This would also provide suitable area for community use.

The gymnasium floor, according to Nickel,[1] should be constructed of hard maple, 7/8 to 1 1/8 inches thick. The lower walls of the gymnasium should be smooth to avoid injury to the users. The upper walls are best constructed of simple materials such as cinder blocks which have been painted. The ceiling should be at least 22 feet from the floor to the under side of the structural members.

The ceiling should be acoustically treated. The gymnasium should have maximum window area in order to obtain good natural lighting and circulation of air. Caution should be exercised against drafts from windows; and the windows should be covered with wire screening.

According to Engelhardt, Engelhardt, Leggett,[2]

"The gymnasium should provide 15 foot candles of artificial lighting at floor level."

All heating and lighting fixtures, clocks, drinking fountains, piano and other equipment should be recessed. Mat racks should be provided for storage of mats.

Small equipment such as bats, balls, and hand apparatus can be stored in lockers located in the locker rooms. A room 14 by 42 feet[3] or larger if necessary for storage of larger equipment should be provided adjacent to the gymnasium.

1/Vernon L. Nickel, op. cit., p. 9.
2/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 132.
3/Ibid., p. 87.

The gymnasium should be located in a wing of the building to prevent any disturbance of classes that may be in session; and it should be readily accessible to the athletic fields and accessible to the public without using the building hallways.

Dressing Rooms and Showers:-- Immediately below the gymnasium there should be provided dressing rooms and shower facilities for boys and girls.

Engelhardt, Engelhardt, Leggett[1] make the following recommendations relative to dressing rooms and showers:

> "Dressing rooms and showers should be of such size and number that the maximum size of class (35 students) can bathe and dress in the relatively short period of time allowed for this purpose. This usually requires a floor area about equal to that of the gymnasium. Such an area has been found ample for the needs of visiting athletic teams as well as for regular classes, although the lockers provided for team use should be in a room separate from the regular class lockers. With the exception of team facilities, the lockers needed for the service of girls need not be different from those of boys. Basket service for the safekeeping of gymnasium clothing has been proven to be highly satisfactory. Full length lockers are preferred for the storage of street clothing while classes are in progress.
>
> For the use of boys, gang showers may be used satisfactorily, while individual showers and dressing booths should be provided for girls. The number of these facilities should be sufficient to accommodate the largest enrolled class in physical education. Immediately adjoining toilet facilities should be provided for all dressing rooms and showers. Built in hair drying machines with foot pedal control and adjustable nozzles are necessary for use of girls and desirable for boys' dressing rooms. Electrical drying equipment for face and hands has much to be said for it from the standpoint of sanitation."

The American Association of School Administrators[2] has this to say on the same subject,

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1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 133.

2/A. A. S. A., American School Buildings, op. cit., pp. 106-107.

should be four dressing rooms, two for physical education classes and two for athletic teams. Each dressing room should be equipped with at least 35 full size lockers for street clothing. The two rooms for physical education classes should be equipped with sufficient baskets for storage of gymnasium clothing to accommodate the total enrollment of the school. The room to be used by the home athletic teams should be provided with at least 35 lockers (7 1/2 by 24 by 12 inches)[1] for storage of athletic uniforms. These lockers should be ventilated.

There should be three shower rooms and three drying rooms, one for girls' physical education classes, one for boys' classes, and one for varsity athletic teams. Gang showers should be provided for the boys and individual showers and two dressing booths per shower for the girls. Enough showers should be provided to accommodate individual classes of 35 students.

In addition, there should be one office for the girls' physical education instructor with its own shower and toilet facilities.

Toilet facilities should be provided in the gymnasium for the use of the public.

Auditorium:— North Smithfield should have an auditorium capable of seating the entire student body, so that all students can attend assembly programs when necessary. The Consultants[2] have proposed a building large enough to accommodate 400 students. The writer recommends an auditorium with a seating capacity of 500 to permit its use by the community also.

Six square feet of floor area per pupil should be allowed.[3]

1/A. A. S. A., American School Buildings, op. cit., p. 191.
2/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, School Building Survey of North Smithfield, Rhode Island, op. cit.,p. 34.
3/Vernon L. Nickel, op. cit., p. 9.

The ceiling should be at least 15 feet high.[1]

The auditorium should be constructed to serve the needs of the community as well as those of the school. Therefore, it should be located in a separate wing of the building, where it can have separate entrances, with toilet facilities at the entrance for community audiences, and can be closed off from the rest of the building.

The auditorium should have a sloping floor; comfortable stationary seats; opaque window shades, floor space of 20 by 25 feet for the orchestra; and a built-in projector to speaker cable.

The stage should be 25 feet deep and have a proscenium of at least 24 feet.[2]

There should be two dressing rooms located below the stage each having toilet facilities; and there should be ample storage space for scenery on the sides and in a grid overhead.

Administrative Office Suite:-- The school office suite should include a general office with a closet and toilet facilities; principal's private office with a closet and toilet facilities; fire proof vault for records; and a storage room for school supplies and textbooks not in use. The storage room should be 23 by 20 feet. It may well be a place where all school supplies for the town can be stored.

The general office should have a counter, desk space for two clerks, waiting area, closet and the vault.

The principal's private office should be large enough to hold small group conferences, and should open directly into the general office, waiting room and the school corridor.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, School Building Survey of North Smithfield, Rhode Island, op. cit., p. 9.

2/A. A. S. A., American School Buildings, op. cit., p. 117.

The administrative offices should be located near the main entrance to the building.

The general office should have good natural and artificial lighting and should be large enough to keep filing cabinets, bulletin boards, and have plenty of desk space for two clerks.

The supply and book room needs no natural lighting, but should be ventilated.

Guidance Suite:-- This suite should include an office, a conference room, a testing room, and a reception room.

Adequate storage space for individual student records and the equipment needed in testing should be provided. The reception room should have shelves for exhibiting college and school catalogs, and books and pamphlets pertaining to vocations.

The guidance suite should adjoin the general offices.

Health Unit:-- The health unit should include:

(1) a nurse's room with 80 square feet of floor space[1/]

(2) a waiting room with 100 square feet of floor space[2/]

(3) a medical examination room with 150 square feet of floor space and toilet facilities[3/]

(4) two rest rooms, each having two cots and 150 square feet of floor space[4/]

(5) and a dental examination room with 100 square feet of floor space[5/]

The health unit should be located near the administration offices.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit. p. 85.
2/Ibid.,p. 85.
3/Ibid.,p. 196.
4/Ibid.,p. 196
5/Ibid.,p. 85.

Teachers' Rooms:-- There should be two teachers' rooms, one for men and one for women. Each should be 23 by 12 feet and should be well lighted and attractively furnished. Each should be equipped with toilet facilities and clothes lockers.

Cafeteria:-- The cafeteria should be large enough to seat one-half of the school's enrollment, or about 200. A cafeteria seating this number would be very desirable for community use.

Engelhardt, Engelhardt, Leggett[1] have the following to say about seating capacities of cafeterias.

"Good school administration makes possible having at least two or probably three periods for cafeteria service. This means that the cafeteria should never be required to seat more than one-half, and preferably not more than one-third, of the student enrollment at one time."

The cafeteria should be located on the ground floor and be easily accessible to the service driveways, and have exits to the outside, making it convenient for the public to use it without going through the building. This room should be well lighted, well ventilated and be constructed of materials that are durable and easy to keep clean. The ceiling should be acoustically treated. It is desirable that adequate lighting facilities be installed to make the cafeteria available for use as a study hall.

Regarding the size of the students' dining area, the American Association of School Administrators[2] says,

"Approximately 10 square feet per person should be allowed in the dining area for the largest lunch shift."

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 138.
2/A. A. S. A., American School Buildings, op. cit., p. 119.

The students' dining room should have an area of 2,000 square feet.

There should be a kitchen properly equipped for cooking, dishwashing, food preparation and have approximately 10 feet of counter space for serving a dining area of about 200 seats.[1] The kitchen should be cut off by a partition from the dining area.

Engelhardt, Engelhardt and Leggett say that,[2]

"The decoration of the cafeteria should create a cheerful and attractive atmosphere. The color scheme should be pleasant and non-irritating."

The writer recommends the installation of two drinking fountains in the cafeteria on the basis of the following recommendation.[3]

"The fountains can be arranged so that one fountain is available for every 150 patrons and is so located that it may form an attractive part of the dining room when it is used for other purposes."

In addition, there should be a separate dining room for teachers. It would not have to be very large. It should be constructed to seat only about 25. Both teachers and students could use a common serving counter. The area of the teachers' dining room should be 250-300 square feet.

Adjacent to the kitchen area there should be a storage room for foods and equipment. Relative to the sizes of the kitchen area and storage room,

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1/A. A. S. A., American School Buildings, op. cit., p. 120.
2/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 138.
3/Ibid., p. 138

the American Association of School Administrators[1] has this to say,

> "The kitchen area, including dishwashing, but exclusive of storage, will usually require 1 1/2 square feet per meal load with a minimum of 300 square feet. The size of the storerooms will depend upon the policy of central or local storage, but usually a minimum of 1/2 square foot for storage is required per meal served."

Therefore, the writer recommends a kitchen with floor space of 600 square feet, and a storage room with 200 square feet of storage space for this school.

Also, there should be a dressing room with toilet facilities for the kitchen help.

According to the American Association of School Administrators[2] a school lunchroom requires the following basic equipment, which the writer recommends be installed in our cafeteria.

Cooking - Two-section heavy duty range with oven

Sinks - Two-compartment vegetable and pot sink.
Three-compartment dishwashing sink (or a single tank dishwashing machine with 20" by 20" racks)
Mop sink
Wash basin

Refrigerators - 60 cubic feet (or 6' X 6' walk-in box)

Tables - Receiving, 24" X 48"
Cook's and baker's, 30" X 72"
Salad and sandwich, 30" X 72"
Soiled dish, 27" X 72"
Clean dish, 24" X 48"

Truck - 22" X 30", 28" high

Counter - 27" X 30" wide X 10' long (exclusive of tray and silver area) with 12" tray rail.

Kitchen Machines - 12 quart mixer on 18" X 24" cabinet base

1/A. A. S. A., American School Buildings, op. cit., p. 120.
2/Ibid., p. 120.

11. Other Building Facilities

Corridors:-- In any school building being planned for the safety of students, corridors are of great importance. Since Rhode Island has no laws or regulations governing school building construction, the writer is following the recommendations of educational authorities on the subject of school building construction.

Relative to the construction of stairways, passages, and corridors, Engelhardt, Engelhardt, Leggett[1] have this to say,

> "Stairways, passages, and corridors should be planned coordinately in a manner which eliminates dead-ends in which pupils might conceivably be trapped. The maximum distance of classroom doors from exits is generally placed at 100 feet by safety engineers. All exit doors should be so hung that they swing outward, and the hardware equipment should be such that it is impossible to lock the doors from the inside. Pressure bars for opening are especially desirable. Recognized corridor widths are eight feet for eight room schools, ten feet for sixteen room buildings, and twelve feet for larger structures.
>
> Natural and artificial light should be such as to provide a minimum of four foot candles at floor level."

The above recommendations should be followed in the construction of the corridors.

Our school should have corridors that are safe, quiet, and attractive. They should be 12 feet wide[2] and 8 feet 6 inches high.[3] Fire apparatus, radiators, drinking fountains, and all other kinds of corridor equipment should be recessed in a manner which eliminates interference with free passage. There should be no stairways in the building, other than those leading to the gymnasium dressing rooms, since the building would consist of only one story.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 197.
2/Ibid., p. 197
3/Vernon L. Nickel, op. cit., p. 9.

Corridors should be equipped with lockers, inset in corridor walls. Each locker should be of a single tier and be 12 by 15 by 72 inches.[1] At least one locker should be provided for each student up to 125 per cent of the school's capacity.[2] Therefore, 500 lockers would be required since the building is being planned to accommodate 400 students.

Toilet Facilities:-- This building should have boys' and girls' toilets on each floor if more than one is built. Corner rooms are best because they permit cross ventilation. Much window space should be provided to obtain natural sunlight. A northern exposure is undesirable for this purpose.

Relative to the number of toilet units needed for boys' and girls' toilets, the Committee on School Plant Research of the American Council on Education[3] has the following to say,

"The girls' toilets should have one toilet unit for every 45 students; and the boys' toilets, one toilet unit for every 100 students and one urinal for every 30 students. Each toilet should have one lavatory for every 100 students."

The writer differs only on the last of the above recommendations. He prefers to follow the recommendation of the American Association of School Administrators[4] on the number of lavatories needed. It is as follows:

"Lavatories or wash basins should be provided in each toilet room in the ratio of one fixture to fifty pupils."

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 81.
2/Ibid., p. 81.
3/Committee on School Plant Research, The Utilization of School Sanitary Facilities, Series VII, School Plant Research, No. 3, American Council on Education, Washington, D. C., The Council, 1942, pp.-23.
4/A. A. S. A., American School Buildings, op. cit., p. 163.

Toilet rooms should have a minimum width of 10 feet and an additional utility space of about 30 inches back of the fixtures is desirable for pipe servicing, according to the American Association of School Administrators.[1]

Toilets located near the entrances to the building will facilitate use by those using the school play yards.

Drinking Fountains:-- There should be at least one drinking fountain for each 60 students and two on each floor of the school.[2] Drinking fountains for grades 7, 8, 9 should be 32 inches high, and 36 inches high for grades 10, 11, 12.[3]

The writer recommends that 7 drinking fountains be installed in the building, 3 for grades 7, 8, 9 and 4 for grades 10, 11, 12. Two fountains should be placed in the corridor near junior high school classrooms and two near senior high school classrooms. Place two near the gymnasium, one for each age level, and the seventh near the gymnasium dressing rooms.

All toilet and drinking fountains should be selected on the basis of their durability and the ease with which they can be kept clean and sanitary.

Fire Alarm System:-- The building should have an adequate fire alarm system connected with the fire station. An adequate supply of fire hose or fire extinguishers should be located in convenient places throughout the building.

Electrical System:-- The electrical system should be adequate for all general and instructional needs. There should be an electric clock and

1/A. A. S. A., American School Buildings, op. cit., p. 163.
2/Vernon L. Nickel, op. cit., p. 15.
3/Ibid., p. 15.

bell system located in each room throughout the building with central controls.

A public address system and inter-communication telephone system should be provided.

All rooms should be equipped with outlets for audio-visual aids equipment.

Heating and Ventilation:-- The heating and ventilating equipment should be continuous and automatic; and each room should have adequate heating and ventilating systems. The heating equipment should be capable of maintaining 70 degree temperatures in all parts of the building in zero weather, and should be capable of being enlarged to serve future building additions.

The heating and ventilating equipment should be installed to care for the needs of the gymnasium and auditorium independently of the remainder of the building for purposes of economy.

Service Areas:-- There should be a janitor's room and repair shop with toilet facilities, and slop sinks and storage closets for janitor's materials located on each floor, if there is more than one floor.

There should be a receiving room and furniture storage facilities (23 by 15 feet) located near the service driveway at the rear of the building. This room should be fire resisting, well lighted and contain an area of 300 - 350 square feet.[1/]

Building Design:-- The success of a school building is measured by the manner in which it serves the students, families, and groups in the community.

1/N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, Planning Secondary School Buildings, op. cit., p. 231.

The building should be attractive, inviting, homelike, well lighted, efficient and clean. More attention should be given to room arrangement and fenestration than to exterior design. The number of stories in the building should be kept to a minimum. A low type of building is recommended for several reasons. It affords better lighting facilities; better ventilation; and a more rapid movement of students from room to room for an economy of time, and through exits for safety.

The use of basement rooms for the gymnasium, auditorium and classrooms should be avoided. It is important that the gymnasium and auditorium be located on the ground level for greater safety and convenience.

The low type building permits better adaptations for future expansion. It is not always possible to anticipate future needs, changing conditions and population trends in any community. A school plant should be constructed to permit expansion when necessary.

Much thought should be given to the problem of orientation in the selection of a school site and formulation of plans for the building. Nickel 1/ has this to say concerning the problem.

> "In the selection of a site and the formulation of plans for a building, school boards should give much thought to the problem of orientation. In most cases general classrooms should have an east or west exposure. Physics and biology rooms should have south or east exposures. Art and drafting rooms should have north or northwest exposures and physical education rooms should have a south or east exposure."

The building and grounds should be planned to meet community as well as educational needs. In this community there is no other building large enough to take care of group meetings of different kinds. The gymnasium

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1/Vernon L. Nickel, op. cit., p. 8.

and auditorium should be made available to the public. The cafeteria and library should be located so that they can be used by the public during school hours without disturbing the students.

The following pages contain a summary of space requirements needed in the proposed North Smithfield Junior-Senior High School Building.

In determining the sizes of the following rooms and space, the writer has followed the recommendations of educational authorities, and the results of his own investigation of room sizes in schools similar in size to North Smithfield's proposed school: administration suite; guidance unit; auditorium dressing rooms, and orchestra space; gymnasium dressing, shower and drying rooms; service areas; and toilets.

These rooms should meet the needs of our school, since they are comparable in size to those of other small schools referred to above.

The size of the above rooms and space are listed in the following summary.

The following is a summary of space requirements including number of rooms, desired average size of class, maximum size of class, initial area, size of room, and home room capacity:

Classrooms	Number of Rooms	Desired Average Size of Room	Maximum Size of Class	Initial Area in Square Feet	Size of Room	Home Room Capacity
Standard						
Junior High	5	25	31	759	23' x 33'	155
Senior High	6	25	36	897	23' x 39'	216
Special						
General Science	1	25	31	1,081	23' x 47'	31
Biology	1	25	45	1,564	23' x 68'	45
Chemistry)						
Physics)	1	25	45	1,564	23' x 68'	45
Home Economics						
1. Food Room	1	20	36	1,242	23' x 54'	
2. Clothing	1	20	36	1,242	23' x 54'	
Industrial Arts						
1. Junior High	1	20	25	1,242	23' x 54'	
2. Senior High	1	20	36	1,794	23' x 78'	
Art	2	25	45	1,334	23' x 58'	
Bookkeeping)						
Stenography)	2	25	45	1,104	23' x 48'	90
Typewriting	1	25	45	1,104	23' x 48'	
Typewriting and Business Machines	1	25	45	1,334	23' x 58'	
General Rooms						
Library and Book Storage	1	60	60	1,692	36' x 47'	
1. Storage Room	1			230	23' x 10'	
Gymnasium	1		Classes & Games	7,296	76' x 96'	
1. Dressing Rooms for Physical Education	2	25		828	23' x 36'	
Toilets	2			100	10' x 10'	

(Continued on next page)

Classrooms	Number of Rooms	Desired Average Size of Room	Maximum Size of Class	Initial Area in Square Feet	Size of Room	Home Room Capacity
General Rooms						
Gymnasium (Continued)						
2. Varsity Rooms	2		35	828	23' x 36'	
Toilets	2			100	10' x 10'	
3. Equipment Storage	1			588	14' x 42'	
4. Shower Rooms	3		35	414	23' x 18'	
5. Drying Rooms	3		35	414	23' x 18'	
6. Instructor's Room	1			225	15' x 15'	
Toilet	1			40	5' x 8'	
Auditorium	1	(Seating Area)	500	3,000	50' x 60' (plus orchestra space)	
1. Stage					25' Deep 24' Proscenium	
2. Dressing Room	2			460	23' x 20'	
Toilets	2			40	5' x 8'	
3. Orchestra Space	(No pit)			500	20' x 25' across	
4. Storage Room (Under Auditorium)	1			552	23' x 24'	
Administration						
1. General Office	1	(Vault and Closet Included)		552	23' x 24'	
Toilet	1			40	5' x 8'	
2. Principal's Office	1			276	23' x 12'	
Toilet	1			40	5' x 8'	
3. Storage Room	1			460	23' x 20'	
Guidance Unit						
1. Office	1			345	23' x 15'	
2. Testing and Conference Rooms	2	(1 Testing Room, 1 Conference Room)		437	23' x 19'	
3. Reception Room	1			100	10' x 10'	

(Continued on next page)

Classrooms	Number of Rooms	Desired Average Size of Room	Maximum Size of Class	Initial Area in Square Feet	Size of Room	Home Room Capacity
Health Unit						
1. Nurse's Room	1			80	10' x 8'	
2. Waiting Room	1			100	10' x 10'	
3. Medical Examination Room	1			150	10' x 15'	
Toilet	1			40	5' x 8'	
4. Rest Rooms	2	(With Cots)		150	10' x 15'	
Toilets	2			40	5' x 8'	
5. Dental Room	1			100	10' x 10'	
Teachers' Rooms						
1. Men	1			276	23' x 12'	
Toilet	1			100	10' x 10'	
2. Women	1			276	23' x 12'	
Toilet	1			100	10' x 10'	
Cafeteria						
1. Students' Dining Room	1			2,000	40' x 50'	
2. Kitchen	1			600	20' x 30'	
3. Storage Room	1			200	20' x 10'	
4. Teachers' Dining Room	1			300	20' x 15'	
5. Dressing Room for Kitchen Help	1			225	15' x 15'	
Toilet	1			40	5' x 8'	
Services Areas						
1. Janitor's Room and Repair Shop	1			345	23' x 15'	
Toilet	1			40	5' x 8'	
2. Closet with Sink	1			49	7' x 7'	
Furniture Storage	1			345	23' x 15'	
Students' Toilets	2			280	14' x 20'	
Total Home Room Capacity						582

CHAPTER IV

SUMMARY

In the preceding chapters the educational specifications for a six year junior-senior high school building most suitable to the needs of the town of North Smithfield were proposed. These specifications are needed by the architect so that he can draw the preliminary and final plans for the building. They are based upon an educational program which is based upon the common needs of all adolescents and the special needs of the adolescents of North Smithfield. They consist of building and equipment specifications needed to implement the proposed educational program.

Reasons for undertaking study.-- This study was undertaken by the writer after receiving the Engelhardt, Engelhardt and Leggett [1/] report on North Smithfield's school buildings in which they criticized the town for failing to provide adequate educational facilities for its junior and senior high school students. In view of this report and the writer's own observations of the need for improving the educational opportunities for the adolescents of the community, the study was made.

An educational program has been proposed to suit the needs, interests and abilities of all the students. Great effort has been made to plan a

1/ N. L. Engelhardt, N. L. Engelhardt, Jr., Stanton Leggett, School Building Survey of North Smithfield, Rhode Island, op. cit.

program that will keep a majority of the youth in town in school until graduation and provide adequate training for each student. This program takes into consideration the need for knowing each student's qualifications and outlines procedures for educating him, under guidance, according to his aptitudes, interests and capabilities. In other words, the program is designed to care for the individual needs of each student and to prepare him for his life work.

The educational program includes a proposed program of studies with assemblies, guidance and clubs as activities. Also included in the educational program is an explanation of the content of each subject to be studied, and an explanation of activities. These subjects and activities are planned to help meet the common needs of all adolescents,[1/] and the special needs of our students.

Each student will select his program of studies, under guidance, starting in grade 10. Prior to grade 10, all subjects will be required.

The building and equipment specifications proposed by the writer provide adequate space and facilities for implementing the proposed educational program.

The following paragraphs contain a more detailed summary of this study.

Summary of the problem:-- In chapter one the writer points out the need for this study and his responsibility as Superintendent of Schools to make the study, and thereby make available to his School Board

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1/Educational Policies Commission, Education for All American Youth. op. cit.

specifications upon which its members can act and the architect can base his drawings of the preliminary and final plans for the building.

The procedure outlined in chapter one was to develop an appropriate educational program and then to set up the building and equipment specifications based upon this program. The proposed educational program based upon the common and special needs of the adolescents of North Smithfield and certain principles which were stated in the program was clearly outlined in chapter one. It was mentioned, too, that a statement and discussion of each of the common needs of our adolescents, and the functions of both junior and senior high school education would be clearly defined and the needs of North Smithfield described.

In presenting the problem in chapter one, the writer noted that in developing the educational program a study had been made of the Consultants' report; the common needs of adolescents; ways of enriching the small high school curriculum; the writer's observations and conversations with the youth of the community; and recommendations of educational and school-building authorities.

Also noted in presenting the problem was a statement that the building and equipment specifications would be planned to adequately house the proposed educational program. To accomplish this certain information would be needed by the architect for drawing his plans. A list of the information needed by the architect was presented in this chapter. This list was obtained from the American Association of School Administrator's publication, "American School Buildings." Making this information available for the use of the architect was the writer's task in

chapter three of the study.

Summary of the proposed educational program.-- In chapter two an educational program was proposed to meet the common and special needs of our adolescents. This program is similar to that of the mythical town of Farmville discussed at length in this chapter.

The program contains a statement of each of the common needs of all adolescents and an explanation of how each of these needs can be met. Listed under the explanation of each common need are the subjects that should be studied to help the student meet that particular need.

Next, the special individual needs of the adolescents of the community were discussed. Emphasis was placed upon the need of providing an adequate building for both school and community use.

Included in the educational program was a proposed program of studies and activities for student participation. The program of studies included a list of the subjects to be studied each year in grades 7-12; an explanation of the subject matter to be studied under each subject and an explanation of activities; length of the period; number of recitation periods per week per subject; and the total number of instructional periods per week.

Also, ways of aiding a small high school program of studies where there is bound to be a limited number of teachers were listed and explained in detail.

The importance of providing adequate guidance for all students was emphasized in this chapter. It was pointed out that there would be a single curriculum and each student would be permitted to select a program

grades are required. In grades 10, 11, 12, determining the estimated enrollment for each class was more involved. It was necessary to consult with neighboring high school principals to determine the per cent of their enrollments taking each subject. Using these percentages as a basis, the writer was able to estimate the enrollment per subject.

Second, it was necessary to establish the desired average size of each class. It was decided to follow the recommendations of Dr. Michael F. Walsh, Commissioner of Education in Rhode Island. In cases where the estimated enrollment was less than the desired average size of class, the estimated enrollment became the desired average size of class.

After establishing the estimated enrollment per subject and the desired average size per class, the number of standard and special rooms needed was computed.

Next, the maximum pupil capacity per room was computed. A formula proposed by Anderson for determining the maximum pupil capacity per room was used for grades 7, 8, 9. For grades 10, 11, 12 a modification of the Anderson formula, in which T. C. Holy's [1/] values for allowances for schedule making were substituted, was used.

Following this, the sizes of standard and special rooms were determined by using a formula proposed by the writer. Other rooms such as the administrative suite, guidance unit, service areas, toilets and orchestra space were determined on the basis of school building authorities' recommendations and the results of the writer's investigation of

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1/T. C. Holy, "What Is Good Utilization of a School?", The School Executive, op. cit.

schools similar in size to North Smithfield's.

A great part of the remainder of the chapter includes an explanation of the room equipment specifications and a restatement of the program of studies including number of recitation periods per week per subject, and the estimated enrollment per subject.

A summary of the space requirements for the building is found at the end of the chapter. This summary will be helpful to the architect in making quick references to the study.

What the architect needs to know.-- In reviewing this study, the architect should familiarize himself with the proposed educational program. In addition he should know the maximum pupil capacity of each room; the number of standard and special rooms; the size of each room; seating capacity of the auditorium; the size and seating capacity of the gymnasium; the need for a movable partition to divide the gymnasium; the recommended locations of certain general rooms such as the library, cafeteria, auditorium, dressing rooms, showers and drying rooms, gymnasiums, administrative suite, guidance and health units, and toilets. He should study the room equipment specifications. It is important, too, that he know that North Smithfield needs a school building with adequate auditorium, cafeteria, gymnasium and library facilities for both school and community use.

This concludes the study of the educational specifications for a six-year junior-senior high school building most suitable to the needs of North Smithfield.

It is hoped that the citizens who read this study will give serious

consideration to the desirability of having a junior-senior high school, as described, and that construction of the building will be started in 1954.

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