AN ABSTRACT OF THE THESIS OF

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(Date) (Degree) (Major)

Date Thesis presented: May 25, 1942

Title: "Correlating Science Instruction with Health Instruction in a Junior High School"

Abstract Approved: [Redacted]

(Major Professor)

A study concerning the correlation of health and science instruction in the junior high school was undertaken for the following reasons:

(1) Boys and girls in junior high schools need instruction in science;

(2) The need for interesting students in health is well recognized; and

(3) In many schools there are so many subjects included in the curricula that health instruction, as such, is frequently neglected.

The author teaches health to the seventh and eighth grade girls in the Parish Junior High School, Salem, Oregon. A need for science in the curricula of these grades was met by correlating science with the previously established health classes. The teacher had the practical problem of planning and putting into operation successful teaching units for these classes.

Procedures used in making this study were:

1. Science and health courses of study from various school systems were studied.

2. Literature was read upon the subject of health instruction, science instruction, and the correlation of the two subjects.

3. Conferences were held with other health and science teachers.

4. Units of study correlating science and health instruction were planned and used in the author's classes.
5. A questionnaire asking about the teaching of health as a separate class and in correlation with others was sent to twenty-eight health and physical education teachers in twenty Oregon junior high schools.

Nineteen teachers representing seventeen schools returned the questionnaire. Fifteen stated that separate classes for health instruction were held in their schools and four reported that health teaching was done through correlation with other subjects only. Ten of the fifteen reported that planned correlation with other subjects was carried on in addition to the special classes.

The study has attempted to show that the correlation of science with health instruction is a desirable way of motivating health instruction and of introducing science into a curriculum from which it had previously been omitted. There has been no attempt made to set up a model program but merely to present a workable and educationally sound plan.

Conclusions drawn from the study are:

1. Junior high school pupils are intellectually ready for instruction in such areas as personal hygiene, community health, and safety. Material in these fields may be presented through individual classes and/or through correlation with other subjects.

2. Special classes for health and for science with correlation between the two and with other subjects seems to be the most desirable method of including these subjects in the curriculum but correlation of the two with no special science course has been a successful substitute.

3. Health and science material taught should be adapted to the pupils' experience and understanding. It should be taught in whatever way is most effective and this may vary under different circumstances and in different school systems.

4. Many opportunities for introducing and for clinching health facts arise in other fields. Some opportunities of this kind can be assured by planned "leads" in the lesson plans. Success of related teaching depends upon the ability of the teacher to make the most of these opportunities.

5. Health teachers should be well trained in the principles of teaching and health education and should have an adequate background in sciences related to health.
CORRELATING SCIENCE INSTRUCTION
WITH HEALTH INSTRUCTION
IN A JUNIOR HIGH SCHOOL

by

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A THESIS
submitted to the
OREGON STATE COLLEGE

in partial fulfillment of
the requirements for the
degree of
MASTER OF EDUCATION

May 1942
APPROVED:

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ACKNOWLEDGMENT

To Doctor Henrietta Morris, the writer owes a debt of gratitude for her guidance and suggestions in the preparation of this thesis.

Acknowledgment is made to Doctor Elmo N. Stevenson, who offered suggestions for the science experiments used in the experimental work for this thesis.

Acknowledgment is also made to the teachers of health in the Oregon junior high schools, who aided in this study by answering a questionnaire and by making useful suggestions.
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INTRODUCTION

Problem. The problem in this study was to find a way to interest junior high school pupils in the study of health, to give them a greater opportunity to receive instruction in science, and to show how health can be effectively included in the curriculum.

Reasons for the Study. There were three reasons for the writer's making this study: (1) Boys and girls in junior high schools need instruction in science; (2) The need for interesting students in health is well recognized; and (3) In many schools there are so many subjects included in the curricula that health instruction, as such, is frequently neglected.

Time limitations in the school curriculum sometimes make it difficult to include all desirable subjects. Because science and health have much subject matter in common, it was believed that correlating the instruction of the two would help to some extent, if not entirely, to solve the problem.
In a bulletin to the teachers of the Salem Public Schools of Salem, Oregon, under date of February 13, 1941, Mr. Frank B. Bennett, superintendent of schools, says:\footnote{Bulletin to the teachers of the Salem Public Schools, February 13, 1941, p. 1.}

Late in the spring of 1940 it was decided to approach the problem of improving the offerings of the schools from the angle of "student needs"....

Among those needs most prominently mentioned are:

(1) a need for every boy and girl to be given an opportunity to contact work in science during his school years.

At Parrish Junior High School health instruction was already a part of the school program. Since it was desired that science instruction be given the junior high school pupils, the logical subject with which to correlate it was health since both health and science have much common subject matter.

Motivation in health instruction is often a problem. Alma A. Dobbs\footnote{Alma A. Dobbs, Teaching Wholesome Living, p. 45.} remarks that many methods of teaching that once had school value have disappeared. Many of the old forms of motivation have been discarded "in the service of mental hygiene." These included motivation through competition. The writer felt that including related science
material might not only give the pupils a better understanding of health principles but would also add interest to the subject material.

The usual student's non-interest in health may be a wholesome condition, indicating that good health is his; but the condition nevertheless makes presenting meaningful health lessons difficult.

According to A. J. Stoddard,

In health instruction, the obligations which the school assumes are, first of all acquainting the child with the human organism and its functions, including such topics as susceptibility to disease and disease prevention, nutrition and diet, and the facts of reproduction.

Where better can these be taught than in a health class that has been correlating science instruction with health instruction through the school year?

In the elementary schools, emphasis is upon securing desirable health behavior with little of the "whys" or "hows." Junior high school pupils are interested in these and science gives them.

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Definitions of Terms Used. For many years the term "health education" was loosely used; sometimes it referred to the whole health program; sometimes to health instruction only. In 1934 the Committee on Terminology of the Health Education Section of the American Physical Education Association\(^4\) defined "health education" and a number of other terms used in relation to it. Among them are:

Health education is the sum of all experiences which favorably influence habits, attitudes, and knowledge relating to individual, community and racial health.

Health instruction is that organization of learning experiences directed towards the development of favorable health knowledge, attitudes, and practices.

Healthful school living is a term that designates the provision of a wholesome environment, the organization of a healthful school day, and the establishment of such teacher-pupil relationships that give a safe sanitary school favorable to the best development and living of pupils and teachers.

"Correlation" is defined in the Handbook on Curriculum Study\(^5\) as "a mutual relationship existing between two or more school subjects."

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In this study the terms as defined above will be used.

**Location of the Study.** The study was made in the health classes for the seventh and eighth grade girls at the J. L. Parrish Junior High School in Salem, Oregon, of which classes the author is teacher.

**Characteristics of the School in Which the Study Was Made.** The J. L. Parrish Junior High School is the larger of the two junior high schools in Salem, Oregon, a town of about 30,000 population.

There are some 850 pupils in the three grades: seventh, eighth, and ninth. They come from families most often found in and around a capital city, chiefly, professional and business people and farmers rather than factory or mill workers, although there are some of those at Parrish too.

The health instruction classes are divided into grades, and separate sections are taught for boys and girls. In the seventh and eighth grades, the health instruction is delegated to the health and physical education teachers. In the ninth grade, there is a different arrangement. The physical education teachers are responsible for some of the material taught and the science teachers are responsible for other material—as determined by material in the science text book.
Health, physical education, and general science are required subjects for the ninth graders and health and physical education are required in the seventh and eighth grades.

Class periods are about fifty minutes long. The science classes meet each day. However, the health and physical education classes alternate, with two health classes one week and three the next.

**Limitations of the Study.** A number of limitations were encountered.

The classes were large, numbering from thirty-three to forty-five, and were all held in a regular class room, equipped with desks and a teacher's desk. This, added to the limited space and equipment available, often made experimentation by the entire class impossible and made demonstration necessary.

It was found that the pupils had little scientific background and that what they had was secured largely through nature study. This necessitated building up scientific methods and procedures.

In addition, the health textbooks in use at the Parrish Junior High School were not adapted to such teaching and a very limited number of supplementary textbooks was available.
These supplementary textbooks were both science and health books in which the authors had made some effort to correlate the teaching of the two subjects.

**Procedures Used.** A number of procedures were used in making this study. Some involved a great deal more time and some produced better results than others.

Courses of study, both science and health, were studied.

Reading of literature upon the subjects of health instruction, science instruction, and the correlation of the two subjects was done.

Conferences with other science and health teachers were held.

A carefully prepared questionnaire, together with an explanatory letter (copies of which appear in the appendix), was sent to twenty-eight teachers—sixteen women and twelve men—of health and physical education, in twenty Oregon school systems which have junior high schools.

Units of study correlating science instruction with health instruction were planned. (Examples of units used may be found in Chapter VI and a list of others in the appendix.) These units were used in the writer's classes. In some cases demonstrations were made by the teacher; in
some cases, by the students; and in a very few instances, experiments were made by the entire class.

The names of the teachers to whom the questionnaires were sent were found in the Oregon School Directory for 1941-42. Questionnaires were sent to every school district having a junior high school except to those in which the health teachers are new this year.

Nineteen questionnaires from seventeen different school systems were returned. Of these, thirteen were from women and six from men.

CHAPTER II

HISTORICAL BACKGROUND

Health education is not a new movement. Temkin\textsuperscript{1} says, "Health education is as old as medicine. Primitive parents told their children the danger of poisonous snakes and inedible plants and of the best ways of preventing disease by placating the wrath of the gods and demons." Health education is old but has gone through decisive changes not only in forms and ways of presentation but in concepts also.

The early Greeks had health education, for on a limited scale everyone received the advice of doctors. Later, in the Middle Ages among the barbaric people, health education gradually ceased to be a matter of primary concern and the monks attempted to correct this by setting an example of moderate drinking and eating. However, the most effective early work of the church was to fight against superstition and the priests assumed a position as health educators equal to or surpassing the importance of the physicians. This was true in Biblical times also.

\textsuperscript{1} Owsei Temkin, "Health Education Through the Ages," \textit{Journal of Public Health}, pp. 1091-95, September, 1940.
Temkin\(^2\) says further, "For even today the work of health educators is greatly one of enlightenment."

Not until the nineteenth century were there organized forces for promoting health, and in the nineteenth and twentieth centuries fell the task of making health education effective and of putting it on a broader basis.

Marguerite M. Hussey,\(^3\) in discussing the changes in health education, states, "Teaching people to keep well is not a recent move in this country.--As early as the middle of the eighteenth century definite attempts were made to get people to improve their manner of living."

Physicians wrote books, largely on anatomy and for adults, giving advice for curing illness and some general rules on how to keep from being ill. Some was sound advice; such as, avoid excess, especially in eating and drinking; breathe fresh air; get ample exercise.

However, such general advice did not result in any apparent improvement in people at large, because it reached too few.

\(^2\) Ibid.

Many physicians and teachers interested in promoting better health among the people felt that a knowledge of anatomy would develop an interest in good health and that individuals having a knowledge of anatomy would follow good health rules. As a result, health teaching became anatomy and physiology teaching. But there was still a lack of interest and an apathy on the part of the general population.

Some of those interested in the health movement, recognizing the influence of the church, urged it to take part, but those of the church felt that things of the flesh were of little importance and refused to be interested.

Gradually it was felt that a knowledge of anatomy and physiology alone was not enough to gain the desired ends of healthful living. Therefore, more hygiene material was added, but the emphasis was still upon learning facts.

Because of a continued lack of interest in healthful living, some teachers attempted to give the children in their classes an opportunity to practice health in the schoolroom and to report on home health activities. Health practices in the classroom consisted of inspection of hands, handkerchiefs, teeth, and so forth with the idea
that the children could be "trained" into healthful behavior. This was the second trend in health teaching. This trend is exemplified in the methods and materials used by the voluntary health organizations in their programs which contributed greatly to the development of health education during the latter part of the second and the third decades of this century. The Modern Health Crusade sponsored by the National Tuberculosis Association was among the first and most widely used of these programs. Other voluntary agencies which were especially active in the promotion of health education at that time were the American Child Health Association and the Commonwealth Fund.

Later, teachers, following Thorndike's theory that learning occurs when there is an interest in the learning, injected health principles into tool subjects and combined health instruction with other activities through plays, games, health clubs, and contests; and by "correlation" with general science, biology, civics, history, and home economics. This is the method in general practice at the present time.
Hussey\textsuperscript{4} sums up the subject of trends in health education by saying, "As far as 'health instruction' is concerned it may be said, then, that there are three trends discernible. The first was an emphasis on teaching information in the field of anatomy and physiology and later of hygiene. The second trend was the effort to 'train' the learner in desirable health habits and the third was a stress on the necessity of developing interests or attitudes."

\textsuperscript{4}Ibid., p. 18.
CHAPTER III

CORRELATION IN HEALTH TEACHING

Correlation in teaching refers to the systematic relating of two or more subjects to each other. It is generally accomplished in schools where separate subject-matter classes are taught by originating a unit of teaching in connection with a certain subject such as history, and relating it to the teaching of other topics, such as English, art, spelling, and so forth. In practice, the correlation is often more fully developed in the class where it originated than in the other classes; this is especially true in a departmentalized school where the various subjects are taught by different teachers. Sometimes the correlation is carried out in only one class (e.g., science is brought into the health class but no health teaching is introduced into the science class), although it is more desirable to make the correlation mutual. In some instances no direct instruction is given in a separate class in a certain subject but it is taught only by introducing it into the tool subjects where it usually receives minor stress.

Correlation of school subjects is not a new idea. For many years teachers have combined units of work in one subject with another. This has been partly the result of
the need to conserve time and partly the recognition by
the teachers of the relationship of material in different
fields.

Kilpatrick\textsuperscript{1} has called teaching the "way" of doing
a thing without teaching the "why" of it a "kind of sleep-
walking kind of teaching" and says that health habits are
all right but that we need them "knit" into understandings
and built into the child's very personality, so that he
understands the "why" of it.

Teaching the "why" of health habits requires the
correlation of many school subjects.

In a \textbf{Tentative Guide to Science for Oregon
Schools}\textsuperscript{2} it is stated

There has been much science taught in Oregon
schools for years, although perhaps it was not called
science, and may not always have been presented in
well-organized units of study. Weather, climate,
time, sun and moon, care of animals, and physiology
are all science topics. Many nature study, agricul-
ture, health, social study, and geography classes
have dealt primarily with science.

This combination of subjects was not necessarily
called "correlation" but such it was.

\textsuperscript{1}W. H. Kilpatrick, "Proceedings," Sixth Health
Education Conference, Sayville, L. I., \textit{Journal of American
Child Health Association}, June, 1930, pp. 5-23.

\textsuperscript{2}\textit{Tentative Guide to Science for Oregon Schools,
Part I, Elementary and Junior High School Grades}, State
According to the writers of the Georgia health course of study

This particular period [the junior high school age] in a child's life is especially suitable for developing scientific understanding in regard to correct health practices. Many harmful ideas of the care of the body will have to be replaced by scientific knowledge, attitudes, and procedures. Questions of proper working conditions, the need for exercise, rest, and fresh air, nourishing food, correct posture, social relationships, and appropriate grooming habits are a few of the important problems which should be discussed by both boys and girls.

With the pending shortage of labor, particularly farm labor, the problem of proper working conditions as it affects health will be a problem directly concerning junior high school pupils, because for the first time in years boys and girls of this age will be called upon in large numbers to take their places in the working world.

The recognition of these problems and the discussion, and at least partial solution of them, is necessarily the duty of the school and particularly that of the health instruction classes. Health knowledge does not necessarily result in desirable health practices but desirable attitudes and practical knowledge regarding himself may motivate a pupil to develop healthful behavior in himself.

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3Health Education Curriculum, a Tentative Program Suggested for Health Education, Georgia State Department of Education, May, 1941.
Stoddard believes that the first obligation of the school is to acquaint the child with the "human organism" and its functions, including its nutrition. This involves correlation.

Numerous other authorities agree that one of the objectives of the modern school is the building of good mental and physical health by making use of all types of desirable information and experiences. They also agree that it is the obligation of the school to make every health experience in school educational and that to do this requires the active assistance of administrators, school physicians, nurses, dentists, janitors, and teachers of science, homemaking, and physical education.

Chappelear says, "A complete program of health education as administered in schools includes health inspection, physical education, and health instruction by special periods devoted to health instruction and by correlation with other subjects."

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5 Claude S. Chappelear, Health Subject Matter in Natural Science, Teachers College, Columbia University, 1929.
Those teachers who wrote Oregon's Course of Study for Physical Education⁶ for elementary schools in 1935 recognized the need for correlation, for in "General Suggestions" they wrote

Because of the very close relationship between physical care, physical safety, and physical development, the school program should seek all possible correlation with Health Education and Physical Education. The topics of posture, care of body, effects of sunshine and fresh air, bodily effects of exercise, dangers of overexertion, first aid, growth of bones and muscles, and development of a sportsmanlike attitude, are parts of the Health Education program which directly concern Physical Education.

Many other state departments of education have listed in their health education courses of study suggested units for correlation with science and in the science courses of study, suggested units for correlation with health instruction. An especially interesting unit is found in the Massachusetts health course of study.⁷

In Health in Schools,⁸ is found this definition of health instruction:

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⁷ Course of Study in Health Education, Bulletin No. 3, Massachusetts Department of Education and Massachusetts Department of Public Health.

⁸ Health in Schools, 20th Year Book, American Association of School Administrators, a Department of the National Education Association, February, 1942, p. 21.
Health instruction means teaching children in the classrooms and in all situations in the school by direct and by incidental methods, so that each child may learn by example, the scientific basis for correct living as related to nutrition, clothing, exercise, rest, cleanliness, immunization, first aid, safety, sanitation and desirable social relationships.

This makes it desirable or even necessary that all appropriate studies be correlated with health. In fact, complete correlation of all subjects in a junior high school might be desirable, but as the junior high school is now organized this is impractical. It is much more nearly possible in a classroom where the same teacher has a class the entire day and where she teaches all the class material presented. However, it is possible and practical to make special plans for correlation of two closely related subjects, as health and science, with incidental correlation of others.

There seems to be no question in the minds of those concerned with health education that health instruction classes should include basic science material and that this material should be more than physiological and anatomical as has been the custom in the past. There seems also to be no question that the junior high school is the proper place for such instruction to take place.
CHAPTER IV

HEALTH INSTRUCTION IN OREGON JUNIOR HIGH SCHOOLS

In 1901, a law was enacted in Oregon in which the teaching of physiology and hygiene was enumerated in the "duties of teachers." ¹

... and it is hereby made the duty of every teacher to give, and of every board of school directors to be caused to be given, to all pupils suitable instruction in physiology and hygiene, with special reference to the effects of alcoholic drinks, stimulants, and narcotics upon the human system. ... . and such instruction shall be given as thoroughly to all pupils as instruction in arithmetic or geography is given.

In 1922, the first course of study for "Health and Hygiene"² was distributed to the elementary school teachers. It contained lists of hygiene subjects covered by the text and had outlines for all eight grades. However, its use was optional with each school. The first required health course of study for elementary schools was published in 1929.

Although the new law required that physiology and hygiene be taught in the schools, health instruction, as

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²Course of Study, Health and Hygiene for Elementary Schools in Oregon, State Department of Education, 1922.
we think of it now, was optional in the Oregon high schools until 1936.

Minimum requirements in health and physical education for standard high schools in Oregon state that beginning with the high school class graduating at the close of the school year 1939-40, students be required to have one unit in health and physical education. This unit is granted for the satisfactory completion of a three-year program which, according to the recommendations of the State Department of Education, should include at least one class period each week for health and two for physical education. Courses of study outlining the work necessary for earning the required unit of credit were prepared by the State Department of Education.

In 1939, the Health and Physical Education Committee of the High School Principals' Association recommended the abolition of health classes as such and substitution of correlated health units in other courses of study in the curriculum, such as general science, biology, personal and business relations, homemaking, and socio-economic problems.

For three or four years "there has been a growing dissatisfaction with the program of health- and physical-education as it has been recommended for the high schools

3Recommendation for Health Instruction in Oregon Secondary Schools, issued by Rex Putnam, Superintendent of Public Instruction, October, 1941.
of Oregon further reports the Health and Physical Education Committee. The recommended program had been a three-day one with two days for physical education and one for health instruction in the classroom.

Many schools, finding this unsatisfactory, varied the procedure by adding more days for class instruction in health, by putting all health instruction in a full-credit course for one semester, or by having an intensive six-weeks' program for health instruction each semester.

In August, 1940, a representative group, consisting of physical-education instructors from several high schools, the heads of physical-education departments in two or three of the major cities of Oregon, high school principals, city superintendents, representatives of the departments of education at Willamette University and the University of Oregon, the State Department of Education, and members of the Health and Physical Education Committee of the Principals' Association met in Salem to consider the problems of health instruction.

Early in the discussion it appeared that there was general dissatisfaction with the two-one program, that no

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4 Ibid.
member desired to have health taught as it was being taught, that the one full semester plan was not satisfactory, and that material supplementary to that in the adopted textbooks was necessary.

As a result, six principles were adopted by the advisory group: 5

1. There should be a health coordinator in every school;

2. There is a definite body of knowledge, experiences, and skills pertaining to maintenance of health that every student should acquire, and this learning should extend throughout the course of secondary education;

3. There is a considerable portion of health subject matter which should be presented in a separate course under trained instructors;

4. There should be a continuity within the health program and a progression from year to year;

5. The course of study in health should be organized around problems, and work on these problems should be carried to conclusion;

6. The emphasis in health instruction should be on habits, experiences, and guidance rather than on the mere acquisition of knowledge.

It will be noted that these principles reject the 1939 recommendations of the Health and Physical Education Committee of the High School Principals' Association that health classes, as such, be abolished. It is probable, 5

5 Ibid.
however, that these principles would meet with the approval of the Health and Physical Education Committee since they were represented on the committee that formulated the principles.

Although the principles adopted by the advisory group were for the high schools, they may well apply to the junior high schools also, for the ninth grade is a part of the high school proper and the junior high school is organized on the same plan as is the high school.

At present, standards for teachers for standard high schools in Oregon require that teachers of health education and of physical education have at least twelve term-hours of preparation in physical education and in health education. A teacher who has had two years' successful teaching experience in these fields and who is recommended by the superintendent who employs her may use this in lieu of one-half the required term-hours.

No course of study for the junior high schools has been prepared by the State Department of Education and since the junior high schools include the seventh, eighth, and ninth grades, health programs within the schools vary greatly.

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6High School Standards and the Basic Program of Studies for Oregon Schools, State Department of Education, p. 5, Revised, 1941.
Even though the last year of the junior high school is the same as the first year of a four-year high school, most health education programs for the ninth grade in the junior high schools are not the programs set forth in the health course of study for high schools.

A state-wide committee is now working on a twelve-year course of study for health teaching in the elementary, junior high, and senior high schools. This course of study will be released during the summer of 1942. The committee will recommend to the State Department of Education that a course in health teaching for the grade level at which the teacher will teach be required of every prospective teacher.

In the survey of health instruction in the junior high schools of Oregon made recently by the writer (a copy of the questionnaire is in the appendix) it was found that each school was "complying with state requirements," as one teacher expressed it, yet each school system was carrying out a different health instruction program and sometimes the programs within the same school system differed. One school system with three junior high schools reported that in one junior high school there is no separate class for health but all health is taught in physical education, home economics, and social science classes.
All nineteen teachers, representing seventeen school systems, who returned the questionnaire reported that there is planned health instruction in their schools. Fifteen of these teachers reported separate classes for health instruction and four relied entirely upon correlation. Ten of the fifteen reported that they also used planned correlation with other subjects.

The subjects which are correlated with health and the number of schools reporting such correlation are shown in the table below.

Table I

Showing the Correlation of Health Instruction and Other Subjects and the Number of Schools Reporting Correlations

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<th>Course</th>
<th>No. of Schools Reporting Correlation</th>
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</thead>
<tbody>
<tr>
<td>Science</td>
<td>9</td>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Physical Education</td>
<td>5</td>
<td>Art</td>
<td>1</td>
</tr>
<tr>
<td>Social Science</td>
<td>5</td>
<td>Spelling</td>
<td>1</td>
</tr>
<tr>
<td>Home Economics</td>
<td>4</td>
<td></td>
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</tr>
</tbody>
</table>

In the junior high school where the studies connected with this thesis were made, science and health are correlated by introducing science into the seventh and
eighth grade health classes. In the ninth grade, both science and health classes are held and correlation is made between the two.

In many schools the writer found that in the seventh and eighth grades health instruction is included in other subjects and no health classes, as such, are held. In the ninth grade in these schools, however, health classes are held.

In the questionnaires two attitudes were expressed concerning health instruction classes. One group, eleven in number and much in the majority, felt that classes for health instruction were necessary and that correlation was highly desirable. The other group, numbering three, felt that health instruction might best be given through correlation only.

The arguments for separate classes included: "With correlation only there is not much opportunity for personal hygiene."

"Definite attempts towards correlation seem highly desirable. However, we feel the need of a definite health education instruction program in addition. Our experience has been the average teacher doesn't want to assume the responsibility for the amount of work to make possible doing away with health education instruction."
"There is also need for a definite period for health education to present needed knowledge before it can be correlated."

"Correlation only, health tended to be lost."

"Health classes lack enthusiasm but with correlation accepted as other classes."

Those teachers who felt that classes for health instruction alone were undesirable presented two arguments illustrated by the following quotations: "Motivation is much better than if taught as a separate class."

"When special class in health education, physical education classes suffered. Students have tendency to feel that health education steals from physical education time."

This last opinion was most often expressed by men teachers. It is the observation of the writer that many men and women are teaching both physical education and health education because that is the usual combination in schools and frequently they are not well trained in both subjects. The men are often coaches who have received their chief training as participants in some college sport and are primarily interested in some sport.

Too, frequently the teaching schedule for tool subjects was made and then the teachers with free periods were scheduled to teach the health classes. This condition no
longer exists in large schools where special teachers are employed for different subjects. In small high schools and junior high schools where a teacher teaches four and five subjects, the person teaching health and physical education may not always be a trained teacher in these fields but may have had experience teaching in them.

One teacher summed up the subject of health teaching by saying, "Success depends on the teacher and the enthusiasm she expends on the subject." This is true not only of health teaching but can be said to be true of any endeavor.
CHAPTER V

HEALTH INSTRUCTION IN PARRISH JUNIOR HIGH SCHOOL

In Salem, a definite health instruction program has been carried on for a number of years. In February, 1913, Miss Grace L. Taylor became Salem's first school nurse. For some time previous to this, there had been a part-time school physician and a part-time city health officer in Salem and a part-time health officer in Marion County, but little work was done in the schools.

However, one objective of Miss Taylor's program was to place health work in the schools. One of the biggest problems was to get the teachers to realize that they had a part in the health instruction program.

Health inspection by the nurse, immunizations and inoculations either by the family or school physicians, health crusades, and health contests made up the early program.

In April, 1924, word was received in Salem that some community in the West was to be selected by the Commonwealth Fund of New York City as a location for a five-year demonstration. Any city or county with a population of twenty- to seventy-five thousand would be considered. Marion County, Oregon, with Salem as head-
quarters, was finally selected and on January 17, 1925, Dr. Walter H. Brown arrived in Salem to start the work.

Shortly afterwards, Miss Grace Snook (now Mrs. Tom Wolgamott), director of physical education for girls in the high school and junior high schools and director of physical education for all elementary pupils, planned and inaugurated a course of study in health education in the high school and junior high schools. Even then health was obscured by the great interest in gymnastics or physical education.

Through the years that followed, the health program has been varied and improved, and last year a new course of study, showing progression of material to be presented, was made. This course of study was planned by the six senior and junior high school health teachers and by six grade teachers, one from each grade level.

During the present school year, the boys' health instructors in the senior and junior high schools are working on a course of study for their classes.

Prior to the school year 1941-42, all health instruction, as such, in the Salem junior high schools, was done in the health classes, conducted by the health and physical education teachers. However, at present, all ninth graders are required to take general science and it
was planned that there be definite health units correlated with the science instruction.

Science Problems,¹ Books I, II, and III, by Beauchamp, Mayfield, and West, is used as the text. The book is not written for health correlation but a number of the units were easily adapted for this purpose. (A list of these units will be found in the appendix).

An arrangement exists between the Salem School Board and the Marion County Department of Health that upon the payment of an agreed sum the Salem schools receive the services of the nurses and doctor at the Health Center, as it is most often called.

Nurses call at the junior high schools three afternoons each week and any pupil may be sent to the offices of the Health Department if it is deemed necessary.

Even though there are some differences in the health and physical education programs at the two Salem junior high schools, basically they are the same.

At the Leslie Junior High School, there are only two health teachers and more gymnasium space, so the physical education classes meet more frequently than at Parrish and the health classes less frequently.

Each new student entering a junior high school is given a health examination (an examination score card is inserted in the appendix). The examination is conducted under the supervision of the Marion County Department of Health and is given by a doctor from the Department or by one provided by them. The nurses from the Department and the junior high school health teachers assist.

The boys' health instructors, recognizing the general lack of interest in health, are attempting to do more individual health teaching both in the physical- and health-education classes. In addition to personal conferences with the boys on their health problems, textbook assignments and health reports, followed by discussions, are made. First aid, other than incidentally, is not offered to the boys.

Since the health examinations are usually given before the end of the first month of school, the results of these can be used as a basis for personal conferences.

Observation on the part of the teachers also provides further bases for personal instruction.

For a number of years first aid has been the chief topic of study in the ninth grade girls' health classes. If the girls receive a satisfactory grade in the final examinations, an American Red Cross Junior First Aid Certificate is awarded. A knowledge of some physiology and
anatomy is necessary for mastering first aid, so they have been introduced as background for the first aid.

Since only about half of the girls in the ninth grade were in attendance at Parrish during their eighth grade, it is necessary to repeat much of the biological material presented in the eighth grade. This repetition is not undesirable, since the material is presented from a different point of view.

Such films as "Mechanism of Breathing," "Heart and Circulation," and "Body Defenses Against Disease" are shown and studied. These films are not only physiological but contain much material directly related to first aid.

At Parrish, usually the seventh and eighth grade girls' health classes are taught by one teacher and the ninth grade classes by another. However, this year the ninth grade teacher has one class of seventh graders.

For a number of years the writer has been using some science laboratory experiments, chiefly physiological, in her health classes, but this year has added a number of others.

Four experiments for the seventh graders were used in all classes. They included a study of cells, their functions and growth; the determining of the presence of some of the food substances in various foods; how the right
food affects growth; and how plants and animals store and use stored food.

In the eighth grade health textbooks, the chapters are well adapted for the presentation of anatomy and physiology, especially, with the health subject matter.

As was stated earlier in this thesis there were three reasons for correlating science with the health classes: (1) a desire to give the pupils more science instruction; (2) to motivate health instruction; and (3) to find a way to include health instruction effectively in the curriculum.

A knowledge of anatomy and physiology makes it much more easily understood why, for instance, two-court basketball is not considered a desirable activity for junior high school girls and why certain track events, such as the broad jump, are not included in the physical education program for girls.

In addition to the correlation of science with health in the health classes, other correlations are also made. In the food classes, the value of good foods to health and growth are stressed as is the choice of a good lunch. The relationship of nutrition to the prevention of disease is also presented. In the clothing classes good posture and good grooming are emphasized.
Social studies classes point out, particularly, phases of community health and how lack of sanitation and the lack of observance of health laws may affect the life and even the rise and fall of an empire, as it did the Roman Empire.

After a number of the science laboratory experiments had been carried out in the girls' health classes, approximately one hundred eighth grade girls were asked to answer the following questions and were asked not to sign their names: (1) Did the science study add to your interest in the health classes? (2) Did the science study increase your interest in taking care of your own health?

To the first question all but two of the girls answered in the affirmative. Many discussed their answers, saying that they are interested in how they "are made" and that they felt that it is like being a car owner, for a car owner takes better care of his car if he knows about its mechanism.

This is probably another way of saying, "We're interested in the 'whys'."

One of the two girls who answered "no" said, "Nothing could make me interested in health."

The answers to the second questions were less definite and more divided. This is probably merely an
expression of the fact that those people with good health usually are not interested in health.

There have been both advantages and disadvantages to the health teaching program at Parrish. The advantages have already been indicated. There are two major disadvantages. Teaching science in the seventh and eighth grade health classes has been handicapped by the lack of space and equipment. Interest in most cases would have been even greater had each girl been able to carry out each experiment herself, to make slides for herself and to look at them as long as she liked, and to be able to examine specimens thoroughly and completely rather than hurriedly as has been necessary.

As is frequently the case, the science teachers are not trained in health instruction and in spite of good intentions health receives less stress than is desirable. This is offset, however, by having a class for health instruction.
CHAPTER VI

SUGGESTED UNITS CORRELATING HEALTH INSTRUCTION
WITH SCIENCE INSTRUCTION

Even though correlation of science instruction with health instruction is desirable, teachers should not lose sight of the fact that the real aim and objective of the health class is the establishment of good health habits and attitudes. The science experiments and subject matter which are introduced into the health units should not be artificial devices nor should they be for stimulation only. Instead, they should be a definite part of the organized unit. Pupils should attain a knowledge of facts and procedures that will make health practices intelligent.

Science experimentation at present is focused principally on prolongation of human life. Because of this and because of the relationship between health and physiology and biology, the suggested teaching units which follow have correlated these particular subjects. These units were successfully used in the seventh and eighth grade girls' classes at Parrish Junior High School and may offer suggestions to other teachers of health.
A. Topic: Cells, Their Structure and Function

B. Grade: Seventh

C. Time: Four class periods

D. Objective:

Teacher's:

1. to show that plants and animals are made up of tiny parts called cells

2. to show that there are one-celled and multi-celled animals and plants

3. to show how the body grows

4. to show how the body repairs itself

5. to develop in the pupils a concept of cellular activity, which will lead to an appreciation of the importance of good nutrition.

E. Initial Motivation:

A microscope is placed on the teacher's desk. This stimulates curiosity and a desire to use the instrument and to learn about things which can be seen under it.

F. Introduction:

1. Discussion

   a. how many have looked through field glasses or opera glasses?

   b. what happened? (Object brought closer to eyes)

   c. does anyone know what the microscope is?

   d. what does its name mean?

   e. what does it do? (Enlarge)
f. if you could look at yourself under the microscope, what do you think you would see?

g. if you could look at parts of plants under the microscope, what do you think you would see?

2. Report on Anthony von Leeuwenhoek and his discovery of the microscope

G. Procedure:

1. show drawings of cells and discuss parts (wall nucleus, and protoplasm)

2. show prepared slides of muscle cells, leaf cells, blood cells, and onion skin cells. Discuss how these are different and how they are alike

3. teach girls to make slides from onion skin, from own skin, and from blood. Examine these under the microscope

4. show one-celled animals (amoeba and paramecium) and plants (algae) under the microscope. Compare with cells previously seen

5. show drawings of cell division (reproduction).

H. Discussion:

1. not all animals and plants are multi-cellular as we are

2. how we grow--by cell division

3. how repair takes place if we injure ourselves

4. cells need food, oxygen, and water for growth and reproduction

   a. Enough and the right kinds of foods necessary.
A. Topic: Foodstuffs (nutrients) Essential for Growth and Energy

B. Grade: Seventh

C. Time: Five class periods

D. Objectives:

Teacher's:

1. to show that foods are made up of a variety of components

2. to demonstrate the presence of some of the fundamental components of foods

3. to help students understand why a variety of foods is needed for good nutrition

4. to instill a scientific attitude in regard to food selection

5. to introduce the next unit, "How Food Helps Growth."

E. Initial Motivation:

Interest in this unit is aroused through the study of cells and their growth in the preceding unit.

F. Introduction:

1. Refer to the lessons which have preceded this unit

   a. the pupils have learned in food classes that there are seven foodstuffs--carbohydrates, proteins, fats, minerals, vitamins, water, and cellulose (cellulose is a carbohydrate but since it is not acted upon by the human digestive juices to any appreciable extent it is classed as a separate component for the sake of discussion)
2. Discussion:

a. we say that some foods are "starch foods," "protein foods," or "fat foods." Why do we classify them in this way?

G. Procedure

1. make foodstuffs tests:

a. starch--add iodine to potato or crushed bean; gives blue, black, blue-black, or brown color

b. grape sugar--place some crushed beans in a test tube, cover with water, and add a few drops of Fehling solution. Heat to boiling. Gives yellow-green color that changes to orange

c. protein--add nitric acid to crushed bean; gives lemon yellow color

add ammonia to crushed bean; gives orange color

d. fats--heat fat meat or oil; gives a grease stain

place some crushed bean (preferably castor bean) on a paper and leave in a warm place for a few hours; gives grease stain

e. water--weigh some bean seeds (or a potato) and leave them in a hot, dry place or dry them on a heated dish. Reweigh

loss of weight--loss of water.

H. Discussion:

1. foods usually do not contain only one food nutrient but may have more of one than another
a. It would be more accurate to speak of a food as "protein-rich," carbohydrate-rich," and so forth rather than to use such designations as "protein food".

2. foods contain some substances which are necessary for life and health which cannot be demonstrated by any simple chemical tests which we can carry out in our classroom.

a. Discuss minerals and vitamins

3. Since a well-balanced diet includes all food-stuffs it is necessary that we eat a variety of foods.

Text:


References:


Harris, Florence La Ganke and Ruth Adele Henderson, Let's Study Foods, Boston, Little, Brown and Company, 1941.
A. Topic: How Food Helps Growth

B. Grade: Seventh

C. Time: About four weeks (ten class periods)

D. Objectives:

Teacher's:

1. to show that food and water stimulate growth
2. to show that stored food is used in growth
3. to show that when the food supply is exhausted, growth ceases and the individual dies
4. to show that food and water promote a good upright position
5. to understand that food affects weight
6. to point out that no reducing diet should be followed unless under the direct supervision of a doctor.

E. Initial Motivation:

1. The girls are weighed and measured.

F. Introduction

1. Make reference to the lessons which precede

   a. The students have learned in health and in home economics classes that all plants and animals are made up of cells, similar in function and construction; that these cells require food, water, and oxygen for growth;
that the animal body stores up food in the form of fat and that plants also store food; and that seeds contain a plant germ (that will become a plant under certain circumstances) and stored food. (The last has been shown by simple tests for carbohydrates, fats, etc., and by the fact that humans and animals eat these seeds as food.)

b. They have seen both animal and plant cells under the microscope in health class and know that they are fundamentally alike.

2. Discussion:

a. The world is made up of a lot of things: people, animals, plants, rocks, etc.

(1) how plants and animals and rocks and dirt are alike

(a) can be seen
(b) have weight, shape, size, etc.

(2) how plants and animals and rocks and dirt are different

(a) plants and animals

1. grow
2. take in food
3. reproduce
4. have life

(b) rocks and dirt do not do these

(3) how plants and animals are alike

(a) same as above
(b) are made up of cells
(c) animals and plants must have food, water, air, and sunlight
b. Weight should be continuous but will not be a definite determined amount each month, and if weight does not increase--in children--over a period of six months, a doctor should be consulted

G. Procedure:

1. Each child planted corn, wheat, pea, and bean seeds in shallow vessels, containing only water

2. Each child planted corn, wheat, pea, and bean seeds in shallow vessels filled with dirt (best, if possible, to secure seeds from same ear of corn, etc., since this makes comparison even better)

3. Give fertilizer to some of the plants in dirt

4. Keep all sets of seeds well watered

H. Results to be expected:

1. The seeds in the water may sprout slightly sooner than those in the dirt and for a week or so both will show about equal growth

2. After the first week, the plants in the fertilized dirt will grow the most rapidly and sturdily, and the others in the dirt will grow more rapidly and sturdily than those in the water

3. The seeds will become dry and shriveled

4. After the third or fourth week, the plants living in the water only will begin to droop and show paling in color

I. Discussion:

1. Our bodies store food as fats--that can be used by the body later

2. Our bodies use stored food in case of shortage or in case of increased work or play
3. The right kinds of food promote growth and affect good body position in plants, and since plants and animals basically are alike in structure the same is true of us

Text:


References:

Baxter, Laura, Margaret M. Justin, Lucille Osborn Rust, Sharing Home Life, New York, J. B. Lippincott Company, 1940.


A. Topic: Aids to Good Eyesight

B. Grade: Eighth

C. Time: Six class periods

D. Objectives:

1. to teach that if one's eyes hurt or water, if styes appear, if one doesn't see well, or if other signs of abnormalities appear, an eye examination should be made by a competent person

2. to teach the important habits of caring for the eyes
   a. to teach the necessity for having plenty of and properly directed light when reading, sewing, etc.
   b. to avoid glare when reading, sewing, etc.
   c. to teach that foreign objects in the eye should be removed by a competent person

3. to teach that the health of the eyes is affected by the condition of the other parts of the body

4. to teach that eyestrain may cause headaches, indigestion, nausea, and other signs of poor health

5. to show how the amount of light may be desirably increased in a room.

E. Initial Motivation:

An eye test, using the Snellen "E" chart, is made. (It is stressed at all times that this test measures only one's ability to see at a distance and that if one has styes, watering and itching eyes, if the eyes seem to have sand in them, if the print blurs, or if the eyes burn, one should consult an eye doctor.)
F. Introduction

1. Discussion:
   a. what is an oculist?
   b. what is an optometrist?
   c. what is an optician?
   d. the proper care of the eyes when reading, sewing, playing out of doors, working, etc.
   e. eyestrain; what it is and what causes it
   f. the most common eye defects
   g. why we wear glasses.

G. Procedure:

1. read the chapter in the text, "Aids to Good Eyesight"

2. measure the glass area of the room and compare with the floor area

3. by means of a light meter, check the amount of light in various parts of the room

4. discuss how we can make the darker parts of the room lighter. Cover the blackboard with light paper—as near the color of the wall as possible. Check before and after with a light meter

5. cover the blackboard with white paper and note the increased amount of light and also glare

6. write on shiny paper and on dull paper; place both under a light, and compare as to the amount of glare and the difference in the ease with which the two may be read.
H. Discussion:

1. colors have an effect on lighting
2. the value of consulting an eye doctor
3. the wearing of sun glasses—why, why not, and by whom prescribed
4. why some people wear glasses
5. why all who need glasses should wear them.
6. how needed glasses may improve one's appearance (glasses help avoid red eyes, wrinkles, and squint)
7. the symptoms of eyestrain
8. eyestrain may cause headaches, indigestion, nausea, and other signs of poor health
9. proper conditions when using the eyes for reading and other close work at home, school, etc.
10. what we can do to care for our eyes.

Text:


References:

Better Vision Institute, Why We See Like Human Beings, RCA Building, New York.

Metropolitan Life Insurance Company, Care of the Eyes.
A. Topic: Communicable Diseases, Their Causes and How They are Spread

B. Grade: Eighth

C. Time: At least six class periods

D. Objectives:

1. to show that germs or bacteria (both harmful and beneficial) are everywhere

2. to show that bacteria increase readily under conditions of warmth, food, moisture, and darkness

3. to teach that people should be isolated at the first symptoms of communicable diseases without waiting for a diagnosis

4. to show that because of the presence of germs almost everywhere there is a necessity for
   a. washing the hands before eating
   b. keeping pens, pencils, fingers, etc., out of the mouth
   c. not eating off each other's food
   d. not drinking from each other's glass
   e. not leaving used handkerchiefs lying about
   f. covering the mouth when sneezing or coughing
   g. keeping food covered and clean.

5. to teach that disease germs usually do not live long in an unfavorable environment and therefore freshly contaminated articles are more dangerous than others.
E. Initial Motivation:

1. show film, "Man Against Microbe"\(^1\)

2. read the lives of Louis Pasteur and Edward Jenner.

F. Introduction:

1. Discuss

   a. how many have had chicken pox, mumps, measles, colds, "flu," etc.?

   b. where and how did the pupils get them?

   c. do germs cause all diseases?

   d. are all bacteria harmful?

G. Procedure:

1. make germ cultures by using gelatine culture medium (1 quart gelatine; 1 pint rich beef broth or 1 oz. beef extract; ½ oz. peptone; a pinch of salt; and a little baking soda). Sterilize test tubes, petri dishes, or small bottles by boiling in clean water for an hour. Pour culture medium (about 2 teaspoons) into test tubes while hot and let cool at a slant.

   Material from combs, hands, nails, pencils, puddle water, etc., may be added to the culture medium; and telephone mouthpiece, money, door knobs, eating utensils, toothbrushes, etc., may serve as sources of bacteria. A student may breathe or sneeze into a tube.

   Plug the tubes with cotton and place in a warm, dark place.

\(^1\)"Man Against Microbe," Erpi Classroom Films, Inc.
An incubator may be made by using a box—paper or wooden—in which a light is placed. In one end a thermometer may be placed. Since heat is much more necessary than darkness, the incubator serves nicely and its use speeds up the time of the germ culture appearances.

Results to be expected:

1. after two or three days, colonies will appear as white patches
2. if kept a few more days, the colonies will become colored
3. make slides from the colonies and look at them under a microscope; very small objects—usually round or cigar-shaped—may be seen, sometimes singly and sometimes in groups.

H. Discussion:

1. germs are almost everywhere and most of them increase rapidly under proper conditions of heat, food, moisture, and darkness; but they do not live long under unfavorable conditions
2. because of the presence of germs, there is a necessity for
   a. washing the hands before eating
   b. keeping pens, pencils, fingers, etc., out of the mouth
   c. not eating off each other's food
   d. not drinking from each other's glass
   e. not leaving used handkerchiefs lying about
3. how the spread of bacteria from one person to another may be stopped

4. why there is an incubation period for diseases

5. that the symptoms of many communicable diseases are similar, such as colds, fever, watering eyes, etc.

6. why inoculation and vaccination are desirable.

References:


John Hancock Life Insurance Company, It's Only Measles, Boston.

Metropolitan Life Insurance Company, Edward Jenner.

________, Louis Pasteur.

________, Smallpox is Here.

________, Just a Cold? -- Or.

________, Scarlet Fever.

________, Colds, Influenza, Pneumonia.

Travelers Insurance Company, Affections of the Lungs, Nose, and Throat, Hartford, Conn.

A. Topic: Blood and Circulation

B. Grade: Eighth

C. Time: Six class periods

D. Objectives:

1. to show that the heart is a muscle and functions as such and is affected as are muscles by overwork or exercise, strain, injury, disease, rest, and proper diet

2. to teach the function of the blood stream
   a. to carry food to the cells
   b. to remove waste
   c. to fight disease
   d. to give body warmth

3. to teach that good posture affects the heart

4. to teach that alcohol and tobacco affect the heart.

E. Initial Motivation:

1. show film, "Heart and Circulation"\(^1\)

2. reports on William Harvey and his discovery of the circulation of the blood.

F. Introduction:

1. make reference to lessons which precede
   a. the students have learned about muscles and know that they can be affected, temporarily or permanently, by overwork, strain, injury, and disease

\(^1\)"Heart and Circulation," Erpi Classroom Films, Inc., sound, 1939.
b. the students have learned that the body is made up of cells that need food, oxygen, and water and that give off carbon dioxide

2. discussion
   a. what blood is
   b. why blood is necessary to the body
   c. what people mean when they talk of impure blood
   d. how the blood circulates through the body
   e. how fast the blood circulates
   f. what the pulse is
   g. after loss of blood from a wound or nosebleed, how lost blood is replaced

3. read the chapter, "Helping the Heart," in the text.

G. Procedure

1. show heart and blood vessels of a veal or pork (easily obtained from a meat market). Point out that the heart is a muscle, show the heart valves, and point out the elasticity of the blood vessels. Discuss value of elasticity

2. look at the circulation of the blood in a frog's foot under a microscope. (Give the frog a small dose of ether by putting the ether on cotton and letting the frog inhale the ether)

3. take the pulse, while standing, sitting, and after exercise

4. prick a finger and allow blood to stand for several minutes (clotting)

5. if possible, use a stethoscope to listen to the heart.
H. Discussion

1. what happens to the blood when we exercise our arms and legs
2. what a bruise is
3. how we may treat a bruise. Why
4. why we should not do strenuous exercise right after a meal
5. why we "get into condition" before we take part in very active, strenuous games
6. why it is best that junior high school girls do not play two-court basketball or run long races
7. what we can do to keep our hearts strong and healthy
8. what are the effects of a serious loss of blood
9. how alcohol affects the heart and blood circulation
10. what relationships the food we eat have to keeping a good heart and blood vessels
11. why we should not exercise strenuously after an illness.

Text:


References:


Metropolitan Life Insurance Company, *Give Your Heart a Chance.*

________, Protecting Your Heart.

New York Life Insurance Company, *Diseases of the Heart and Blood Vessels,* Nylinc Medical Notes, No. 7, Medical Dept.


A. Topic: Aiding Digestion
B. Grade: Eighth
C. Time: Six class periods
D. Objectives:

1. to show the process of digestion
2. to show how digested food is transmitted from the intestines to the blood stream and is then carried to the cells of the body
3. to demonstrate the action of digestive juices on food
4. to show that since the acid condition of the stomach is natural, the taking of soda and other anti-acid preparations, so widely advertised, is harmful unless prescribed by a physician
5. to show the value of cooking and thoroughly chewing food.

E. Initial Motivation:

1. show film, "Digestion of Food"

F. Introduction:

1. make reference to the lessons which precede
   a. food is needed by the cells for growth and energy
   b. food and oxygen are carried to the cells by the blood, and waste is carried from the cells by the blood

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1 "Digestion of Food," Erpi Classroom Films, Inc., sound, 1938.
c. food nutrients

2. Discussion

a. why food must be digested
b. what are the organs of digestion (stress the difference between stomach and abdomen)
c. how long it takes food to digest
d. how digested food gets into the blood
e. what the digestive juices do

3. Read the chapter, "Aiding Digestion" in the text.

G. Procedure

1. Experiment 1 - Action of digestive juices on food

a. supplies needed

(1) four test tubes or tumblers
(2) water, rennin, pepsin, and hydrochloric acid
(3) white of a hard-boiled egg

b. procedure

(1) fill one test tube partly full of water
(2) fill another test tube partly full of water and add a few drops of hydrochloric acid
(3) fill the third tube partly full of water and add a few drops of hydrochloric acid and some pepsin
(4) repeat (3) and add some rennin
(5) into each tube drop some pieces--some large and some small--of the white of a hard-boiled egg

c. results to be expected

(1) before the class period is over, the small pieces of egg in test tube 4 will begin to break up and tiny pieces will appear in the tube. Sometimes this happens in tube 3 but in a much lesser degree

2. Experiment 2 - Osmosis

a. supplies needed

(1) uncooked egg

(2) glass tumbler or deep dish, partly full of water

b. procedure

(1) carefully remove the shell of the egg from over the air sac, being careful not to break the skin

(2) place the egg in the glass of water, being sure the egg is covered

c. results to be expected

(1) the water will pass through the egg "skin" into the egg. Usually the skin will stretch and protrude through the opening in the shell. Before the class period is over the saturation point of the egg will be reached and no more water will enter the egg
3. Experiment 3 - The action of a base upon an acid (to demonstrate the action of soda and other anti-acid preparations upon the natural acid condition in the stomach

a. supplies needed

   (1) dilute hydrochloric acid or vinegar
   (2) red and blue litmus paper
   (3) test tubes or glass tumblers
   (4) soda or other anti-acid preparations

b. procedure

   (1) place a piece of blue and of red litmus paper in the acid
       (the red turns blue; no change in the blue)

   (2) place a piece of blue and of red litmus paper in the soda or anti-acid preparations (in solution)
       (the blue turns red; no change in the red)

   (3) add the soda solution to the acid and test with the litmus paper

c. results to be expected

   (1) if the acid was dilute and enough soda was added, no change will take place upon either blue or red litmus paper. More soda solution can be added until even a reaction takes place upon the blue litmus
H. Discussion

1. why the small pieces broke up first—desirability of chewing food thoroughly

2. since the acid condition is natural, the taking of soda and other anti-acid preparations is inadvisable unless prescribed by a physician; that acidosis and hyperacidity may exist in the body but should be treated by a doctor

3. why we cook food

4. why we should not exercise immediately after a meal

5. how osmosis demonstrated with the egg applies to the digestive system—absorption of food.

Text:


References:


CHAPTER VII

SUMMARY AND CONCLUSIONS

This thesis has attempted to show that the correlation of science instruction with health instruction is not only a means of introducing science into an already crowded curriculum but that it is also a very desirable way of motivating health instruction.

No attempt has been made to set up a model program but merely to suggest one way in which both science and health instruction can be introduced into a curriculum.

A number of conclusions may be drawn from the study which the writer has made.

Since the junior high school pupils are of the inquiring age they are ready for instruction in such areas as personal hygiene, community health, and safety. This material may be presented through various individual classes or may very well be presented through correlated subjects.

It is well recognized that the teacher occupies a position of greatest importance in respect to the health education of the children of her group. This requires that the teachers be well trained in the principles of health teaching with an adequate background of science
material. In addition to anatomy, physiology, and bacteriology, health teachers should have a knowledge of psychology and education and a knowledge of the fundamentals of the basic sciences such as physics, chemistry, and biology.

In many schools there is still the regrettable tendency to assign the basic subjects and then to fill up the teaching schedules with assignments in health teaching. Oregon's standards for teachers of health, requiring twelve term hours of health education, should eliminate most of this in Oregon. The health teacher should be as well prepared in her field as any other teacher.

In addition to trained health teachers, trained persons are necessary for supervision and for at least some of the instruction. In the elementary schools most of the teaching is done by the classroom teacher. On the secondary level the direct teaching should be done by specially trained teachers and incidental teaching should be done by every teacher. A specially qualified person is essential to coordinate these efforts.
Special class periods for health instruction and for science instruction, with correlation between the two and with other related subjects, seems to be the most desirable method of including the two in the curriculum, but the correlating of the two with no special science course has been a very highly successful substitute.

In the field of general science and in other fields, many opportunities arise which are admirably suited for both the introduction and clinching of health facts.

These opportunities indicate teaching situations not planned for in a course of study. The individual teacher can insure such opportunities by carefully directing "leads" into his lesson plans. The success of related health teaching depends on the ability of the individual teacher to make the most of these opportunities, whether they be planned or arise naturally from class investigations and discussions.

Another important principle to follow is that the science chosen should be adapted to the level of the pupil. Regardless of his grade placement, the material should be adapted to the pupil's experience and understanding.
In a health class in which science is being correlated, physiology and anatomy must follow—never precede—the all-important motivating approach to health.

As the Purpose of Education in American Democracy\(^1\) says

The educated person

- understands the basic facts concerning health and disease;
- protects his own health and the health of his dependents;
- works to improve the health of the community.

If this is true, it is the duty of the school to teach the pupils these things in whatever way is most effective. Whether it is done in separate or in correlated classes depends upon the local situation.

---

\(^1\) Educational Policies Commission, Purpose of Education in American Democracy, "The Objectives of Self-Realization," National Education Association, 1938, p. 50.
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APPENDIX A

QUESTIONNAIRE
Dear Teacher:

I am making a survey of the methods of health instruction in the junior high schools and should appreciate your filling out the enclosed questionnaire.

I have enclosed a self-addressed, stamped envelope for your convenience in returning the questionnaire.

Should you be interested in my findings, I shall be glad to send you any material you may desire.

Yours truly,

(Miss Doris Neptune)
QUESTIONNAIRE

I. Is there any planned health instruction in your school?  
   a. Is it taught as a separate class?  
   b. Is it taught only through correlation with other subjects?  
      1. What subjects?  
   c. If it is taught as a separate course, is there also planned correlation with other subjects?  
      1. What subjects?  

II. If the answer to Ib is "Yes,"  
   a. How long has this method been in use in your school?  
   b. If not now in use, how long was it tried before it was stopped?  
   c. Comment on the success of the method.  

III. If the answer to Ic is "Yes,"  
   a. How long has this method been in use in your school?  
   b. If not now in use, how long was it tried before it was stopped?  
   c. Comment on the success of the method.
APPENDIX B

SUGGESTED TEACHING UNITS
Units in "Science Problems" with Which Health Units Might be Correlated

Book I

Unit 1. How Do Scientists Make Discoveries?
4. How Do Heating and Cooling Change Materials?
8. How Are Plants and Animals Alike?
9. How Do Plants and Animals Get Food?
10. Why Do We Eat Different Kinds of Food?
11. How Do Plants and Animals Live Together?

Book II

Unit 5. How Do We Use Energy?
6. How Do We Control Heat?
8. How Do Our Bodies Work?
9. How Can You Help Your Body Fight Disease?
10. How Does Life Continue on the Earth?
11. How Does Man Take Care of the Plants and Animals He Uses?

Book III

Unit 1. How Do Human Beings Behave?
2. How Do Scientists Classify Living Things?
6. How Do We Use Sound?
7. How Do We Use Light Energy?

Textbook for ninth grade science classes:

List of Suggested Science Experiments for Correlation with Health

I. Aids to healthy lungs
   a. Experiments
      1. show lungs and trachea and, if possible, include the epiglottis. Secure specimens from meat market
   b. Correlation with health
      1. need for deep breathing
      2. lungs are easily punctured by a fractured rib
      3. diseases, especially tuberculosis and pneumonia, take hold (structure of lung: soft, lobed, and has many air sacs not frequently emptied).

II. Aids to healthy ears
   a. Experiments
      1. use megaphone at ear to increase the amount of sound secured
      2. high and low tones on short and long wires
   b. Correlation with health
      1. usually an audiometer test for hearing has been given near the time this unit is used. Results often show a lack of hearing in certain tone areas
      2. importance of good care of ears.
III. Maintaining body temperature

a. Experiments

1. humidity in the air

   a. breathe on the window and water drops appear. Where does the water we all breathe into the air go when we breathe into the air of a room?

   b. add drops of water and alcohol to back of hand and evaporation takes place

   c. cool room by use of fan only

b. Correlation with health

1. get chills by rapidly cooling off--swimming, after exercise, or from going from a warm room into the cold air--if the body is moist from some cause (need for warm and then cool shower after exercise)

2. need for air circulation in a room

3. how the circulatory system helps control body temperature.

Texts:


References:


APPENDIX C

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