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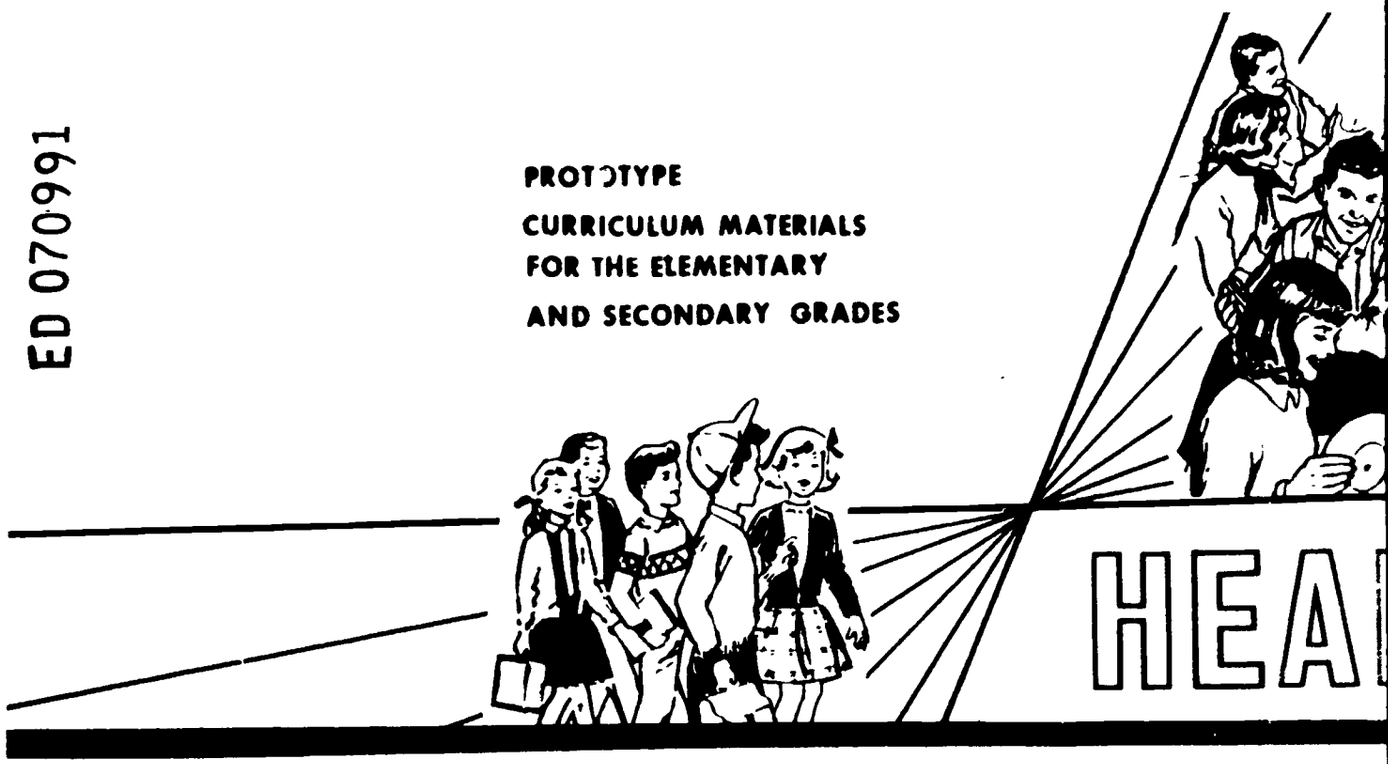
ABSTRACT

This is a curriculum guide for teaching dental health material for grades 7-9. Each topic is outlined under the headings of: (1) reference; (2) major understandings and fundamental concepts; (3) suggested teaching aids and learning activities; and (4) supplementary information for teachers. The topics include: (1) the nature of the problems of dental health; (2) characteristics of oral structures; and (3) the problem of dental carries. The content of this health curriculum guide has been established as a five-strand approach to the concepts, generalizations, understandings, and facts; the values and applications; and the basic skills and decision-making processes that are the keys to good health. The five-strand approach provides maximum flexibility for program development in the schools, and makes it possible to utilize the services of writer-consultants who are experts in their fields. (Related documents for other grade levels are CG 007 694 and CG 007 695.) (Author/BW)

PROTOTYPE
CURRICULUM MATERIALS
FOR THE ELEMENTARY
AND SECONDARY GRADES



GRADES 7,8,9

STRAND I PHYSICAL HEALT

DENTAL HEALTH

THE UNIVERSITY OF THE STATE OF NEW YORK/THE STATE EDUCATION DEPAR
BUREAU OF SECONDARY CURRICULUM DEVELOPMENT/ALBANY, NEW YORK 12

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ELEMENTARY

ONDARY GRADES

HEALTH

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LT STRAND I PHYSICAL HEALTH

DENTAL HEALTH

EPAR OF THE STATE OF NEW YORK/THE STATE EDUCATION DEPARTMENT
K 12 ARY CURRICULUM DEVELOPMENT/ALBANY, NEW YORK 12224/1969

HEALTH CURRICULUM MATERIALS

FOR GRADES 7,8,9

Strand I - Physical Health

—Dental Health

1970 Reprint

The University of the State of New York/The State Education Department
Curriculum Development Center/Albany 12224
1969

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FOREWORD

This publication is concerned with dental health, and is one of a series of topics which will be included in a broad comprehensive health program, specifically designed for grades 7, 8, and 9. When completed, Strand I - Physical Health will contain information on individual health status and fitness, nutrition, and sensory perception as well as a section similar to this one which deals with dental health. These materials are in various stages of development and will be distributed as they are completed.

The utilization of these curriculum materials as part of a K-12 program should lead to a well articulated educational program in health.

The first draft of this manuscript was prepared by Mrs. Helen L. Macko of the Maine-Endwell Senior High School. Donald D. Brown of the Glenmont Elementary School reviewed and revised the first draft in association with Dr. Ross Gutman, supervisor of dental health, and Miss Ina E. Conley, assistant in dental hygiene, both of the Bureau of Health Services of the New York State Education Department.

Dr. John Sinacore, Chief, of the Bureau of School Health and Mrs. Winifred Johnson, associate in the Bureau of School Health made valuable suggestions for content inclusion and revision.

The revised manuscript was prepared for publication by Robert F. Zimmerman, associate in secondary curriculum.

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Director, Curriculum Development Center

INTRODUCTION

Optimal health is dependent upon the interaction of knowledge, attitude, and
this health curriculum guide has been established as a five-strand approach to the
understandings, and facts; the values and applications; the basic skills, and the
that are the keys to good health. The five-strand approach provides maximum flexi
development in the schools, and makes it possible to utilize the services of write
experts in their fields.

At the elementary school level, pupils should experience basic instruction in
prior to the completion of the 6th grade. Elementary school health education expe
tionally based upon the concept of sequential organization of the total spectrum o
content in each grade with a gradual increase of the depth and scope of instructio
through the grades.

The depth exploration of specific health areas by grade does not minimize the
from related health topics as a reinforcement to developing knowledges and concept
probably find that health problems which arise will require the addition of health
areas.

At the junior high school level individual strands might be developed in dept
strands may be developed in accord with local conditions and the developmental nee
the pupils.

A general health education course based upon content from all of the strands
senior high school pupil health education experience. Following this generalized
depth studies of specific strands on an elective basis might be developed to meet

INTRODUCTION

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level, pupils should experience basic instruction in each of the major strands 6th grade. Elementary school health education experiences have been tradi- t of sequential organization of the total spectrum of the health curriculum radual increase of the depth and scope of instruction as the pupil progresses

specific health areas by grade does not minimize the need to develop information a reinforcement to developing knowledges and concepts. The teacher will lems which arise will require the addition of health information from related

level individual strands might be developed in depth or a combination of cord with local conditions and the developmental needs or special interests of

n course based upon content from all of the strands could constitute the initial h education experience. Following this generalized overview, special interest nds on an elective basis might be developed to meet specific student interests.

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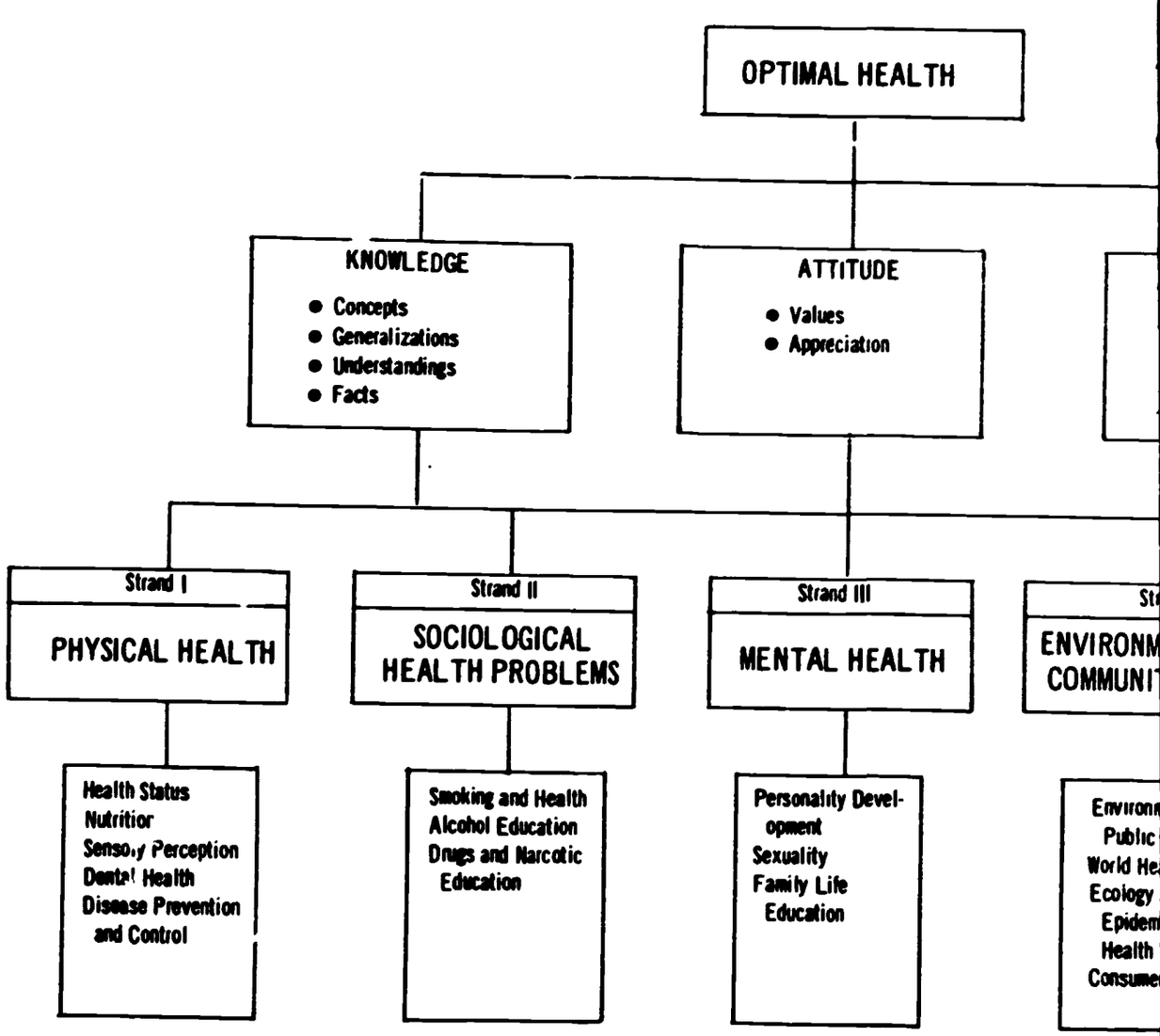
OPTIMAL HEALTH
KNOWLEDGE
• Concepts
• Generalizations
• Understandings
• Facts
ATTITUDE
• Values
• Appreciation
Strand I
PHYSICAL HEALTH
Strand II
SOCIOLOGICAL HEALTH PROBLEMS
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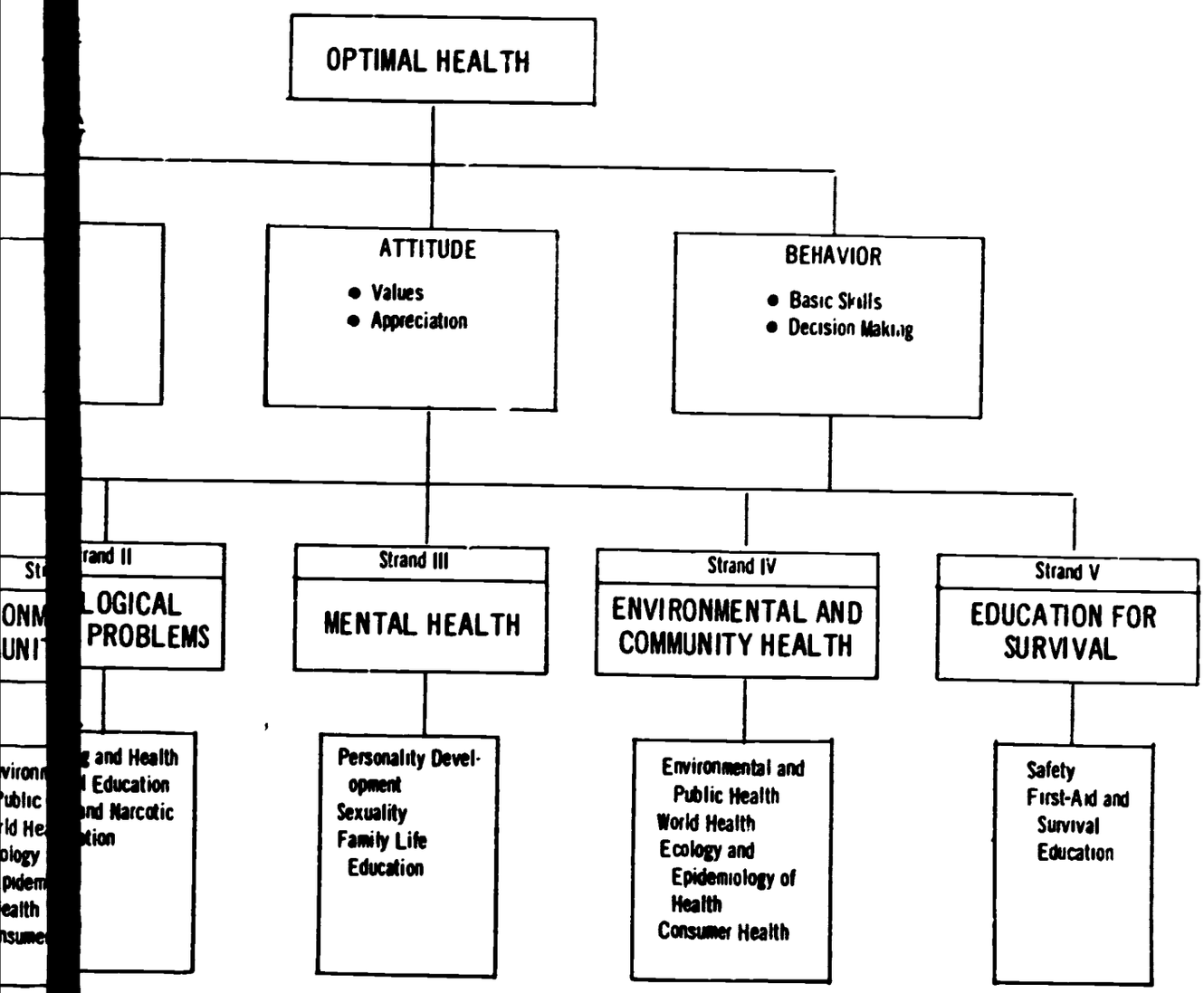
Dental Health
Disease Prevention and Control
Smoking and Health
Alcohol Education
Drugs and Narcotic Education
Personality Development
Sexuality
Family Life Education


OPTIMAL HEALTH
ATTITUDE
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Consumer Health
Strand V
EDUCATION FOR SURVIVAL
Safety
First-Aid and Survival Education

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	S
I. The Nature of the Problems of Dental Health	Having diseased teeth is a world-wide affliction but most people appear to be indifferent to its consequences.	List several other diseases such as measles, diphtheria, polio, etc. that were epidemic in the past but that are now under control.	The of nev the now den inc
A. Scope of the problem in the U.S.	Dental problems in our country are serious; they are widespread and increasing. Dental disease is known to be endemic in this country. Partial prevention of dental disease is no possible but proper care is not practiced widely enough to reduce new occurrences of the disease.	Ask why control of dental disease is different. Ask students to list rules for preventing caries. Follow by asking why they continue to have caries even though they know the rules for limiting them. Estimate the dental needs of your own area. Ask the local dental society for an approximate number of dentists that practice in a certain area. Assume that each person in that area needs 2-3 hours of dental work each year. Determine how many more dentists would be needed to fulfill the needs if each dentist worked a 40 hour week for 50 weeks a year.	In den to sub pre nee fut Mil ben flu
B. World and national dental health status	Maintaining sound teeth is a universal problem.	Film: "The Story of Dentistry." Available from the American Dental Association, Bureau of Audiovisual	

OR UNDERSTANDINGS AND UNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
ng diseased teeth is a d-wide affliction but people appear to be fferent to its equences.	List several other diseases such as measles, diphtheria, polio, etc. that were epidemic in the past but that are now under control.	The potential for prevention of dental illnesses has never been so available to both the dentist and the patient as now; however, the incidence of dental problems continues to increase each year.
al problems in our try are serious; they widespread and easing.	Ask why control of dental disease is different. Ask students to list rules for preventing caries. Follow by asking why they continue to have caries even though they know the rules for limiting them.	In spite of recent advances in dentistry there does not appear to be any immediate hope for substantial reduction of the present backlog of dental cases needing attention in the near future.
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ial prevention of al disease is now ible but proper care ot practiced widely gh to reduce new rrences of the dis- .	Estimate the dental needs of your own area. Ask the local dental society for an approximate number of dentists that practice in a certain area. Assume that each person in that area needs 2-3 hours of dental work each year. Determine how many more dentists would be needed to fulfill the needs if each dentist worked a 40 hour week for 50 weeks a year.	Millions of children are now benefited by the effects of fluoridated drinking water.
taining sound teeth is iversal problem.	Film: "The Story of Dentistry." Available from the American Dental Association, Bureau of Audiovisual	

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENT FOR
	Dental decay and the resulting loss of teeth affects large segments of our population.	Service, 211 East Chicago Ave., Chicago, Ill., 60611. color, 19 min., 1964. Order number DH71. Rental price: $1.50.	
		This film tells of early man's desire to save the facial contours, the advances of dental science, and anesthesia discovery.	Toothaches, tooth decay, to be a leadi absenteeism a
1. Dental decay	Tooth decay is the most common disease requiring professional treatment.		Industries an have recogniz productive ma absenteeism f problems.
		Use line, bar, pie, or pictorial graphs to show information about dental decay.	The seriousne of dental dec below: 1. 50 perce olds hav carious 2. 90 perce in the U dental d of 4 yea 3. By the ag children decayed 4. Less tha high scho free of 5. By the ag average y decayed, teeth inv surfaces.

JOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
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	This film tells of early man's desire to save the facial contours, the advances of dental science, and anesthesia discovery.	Toothaches, resulting from tooth decay, have been shown to be a leading cause of school absenteeism among children.
decay is the most on disease requiring essional treatment.		Industries and labor unions have recognized the loss of productive man hours due to absenteeism for dental problems.
	Use line, bar, pie, or pictorial graphs to show information about dental decay	The seriousness of the problem of dental decay is indicated below: 1. 50 percent of all 2-year olds have 1 or more carious teeth. 2. 90 percent of the children in the United States have dental decay by the age of 4 years. 3. By the age of 5 years, children have 3 or more decayed temporary teeth. 4. Less than 4 percent of the high school pupils are free of dental decay. 5. By the age of 16 years the average youth has 7 decayed, missing or filled teeth involving 14 tooth surfaces.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENT FOR
			6. High sc 2-3 new person 7. Among a 35, the teeth p affecte 8. Accordi States Service approxi America edentul natural 9. By the 1 in ev needs d 10. By the 1 in ev needs d 11. 75-80 p sons ov age are
2. Malocclusion	Each year an increasing number of children are found to require treatment for malocclusion. Furthermore, the demand for orthodontic care is steadily increasing because of improved educational and economic levels of the population.	Demonstrate on a model provided by the dental hygiene teacher how some habits may lead to malocclusion.	One out of f handicapped a result of Some estimat 50 percent f children who severe enoug treatment. A study in M that 30 perc of any given some form of vision.

UNDERSTANDINGS AND AMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
		6. High school youth average 2-3 new cavities per person per year. 7. Among adults, aged 20 to 35, there are from 13-20 teeth per person which are affected by dental decay. 8. According to the United States Public Health Service (Dec. 1967), approximately 20 million Americans, 1 in 10, are edentulous (without natural teeth). 9. By the age of 36 years, 1 in every 5 persons needs dentures. 10. By the age of 55 years, 1 in every 2 persons needs dentures. 11. 75-80 percent of the persons over 65 years of age are edentulous.
ar an increasing of children are o require treatment cclusion. Further- e demand for ntic care is steadily ing because of d educational and c levels of the ion.	Demonstrate on a model provided by the dental hygiene teacher how some habits may lead to malocclusion.	One out of four children is handicapped or disfigured as a result of poor occlusion. Some estimates run as high as 50 percent for the number of children who have malocclusion severe enough to require treatment. A study in Michigan estimated that 30 percent of the children of any given age group needed some form of orthodontic supervision.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPP
			Maloc during denti teeth perma but it of li chang loss.
3. Periodontal disease	Periodontal diseases, ranging from mild to severe, affect large numbers of the population in all age groups.		Diseas bones of tee years. diseas are be ing nu have s Califo 40 per A surv in Bai reveal gum di year-o percen loss o the te
C. Individual dental health status			
1. The 12-18 year age group	Youth between the ages of 12 and 18 years are particularly susceptible to dental disorders.	The present condition of the 6-year or 12-year molars among members of the class can be very	Althou occurs betwee age, i

SUPP	AJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
loc ring nti eth rma t it li ange ss.			Malocclusion is most common during the period of mixed dentition, when the temporary teeth are being shed and the permanent teeth are erupting, but it can occur at any time of life because of the dynamic changes that occur with tooth loss.
seas nes tec ars seas e be g nu ve s lifo per	iodontal diseases, ging from mild to severe, fect large numbers of population in all age ups.		Diseases of the gums and jawbones are a major cause of loss of teeth after the age of 25 years. Cases of periodontal disease in children and youth are being reported in increasing numbers. Some surveys have show that of 12-year-old California school children, 40 percent had gum disorders. A survey among Navy recruits in Bainbridge, Maryland, revealed that 79 percent had gum disorders. A study of 24-year-old women showed that 70 percent had chronic destructive loss of the bone which supports the teeth.
surv Bai real h di ar-o rcen ss o e te			
thou curs twee e, i	th between the ages of and 18 years are partiarly susceptible to tal disorders.	The present condition of the 6-year or 12-year molars among members of the class can be very	Although most dental decay occurs in the growth period between 12 and 18 years of age, it has been estimated

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	Neglect of dental disorders during these years takes a heavy toll of teeth and causes much discomfort. Health practices begun in early life result in sound and attractive teeth in adult life.	revealing regarding their dental health prospects. Step 1: Determine number of years the teeth should serve from now: a. Consider life expectancy: 75 years b. Consider average age now: 15 years c. Approximate remaining years: 60 years Step 2: Age of permanent teeth vs. chronological age: a. Present age: 15 years b. Age 6-year molars erupted: 6 years c. Age of oldest permanent teeth: 9 years Step 3: Stress that each person had 4 sound and healthy 6-year molars 9 years ago For a class of 25 members the total number of 6-year molars 9 years ago would be *100*.	that one-half of the population under the age of 15 has *never* been to a dentist. Public Health Service studies reveal that by the age of 15, more than one-third of the permanent dentition shows evidence of dental disease, thus, in terms of numbers of teeth involved, dental diseases usually take their greatest toll during early life and gradually diminish in intensity during the remainder of life. Teen-age diets and habits are contributing factors to periodontal disease in later life. It has been estimated that 75 percent of 17-18 year olds have some malocclusion.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLE
2. Problems associated with an unhealthy mouth	A healthy mouth and sound, attractive teeth can affect health and appearance as well as social and economic success.	Step 4: Ask how many still have:	Irregul missing attract
3. Assets of good dental health	Teeth are among our most noticeable features. As well as enhancing appearance, teeth influence facial expression, contribute to the contour and tone of facial musculature, allow for normal speech, and initiate the nutritional processes by preparing food for digestion.	(Example) 1 — 4 — 4 2 — 3 — 6 3 — 2 — 6 4 — 1 — 4 20	Missing interfe mastica distinc especia with th sounds, to comm or to l wind in
		(Ask how many still have 4,3,2, or 1 six-year molar teeth that have been neither decayed, filled, nor extracted and add the number. At this age, there will be perhaps 10 healthy 6-year molars out of 100.)	Infected discomf infecti body. An impr can be reveals teeth, o
		Step 5: Ask the students to think about their future prospects for retaining their teeth if they do not provide better care in the future than they have given them in the last 9 years or whatever the difference happens to be.	Clean an tribute through and self

STANDINGS AND AL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
uth and sound, eeth can affect ppearance as al and cess.	Step 4: Ask how many still have:	Irregular, stained, broken, or missing teeth are neither attractive nor healthful.
ong our most eatures.	No. of persons / No. of unfilled, undecayed 6-year molars / Total healthy 6-year molars (Example) 1 / 4 / 4 2 / 3 / 6 3 / 2 / 6 4 / 1 / 4 20	Missing or malaligned teeth interfere with efficient mastication and with the distinct enunciation of words, especially those beginning with the s, t, th, d, and l sounds, and make it difficult to communicate through speech, or to learn to play a musical wind instrument.
nhancing teeth influence ssion, con- he contour and al musculature, ormal speech, the nutri- sses by pre- for digestion.	(Ask how many still have 4,3,2, or 1 six-year molar teeth that have been neither decayed, filled, nor extracted and add the number. At this age, there will be perhaps 10 healthy 6-year molars out of 100.)	Infected teeth not only cause discomfort but can cause infection in other parts of the body.
		An impression of attractiveness can be ruined by a smile that reveals dirty, lost or decayed teeth, or
	Step 5: Ask the students to think about their future prospects for retaining their teeth if they do not provide better care in the future than they have given them in the last 9 years or whatever the difference happens to be.	Clean and healthy teeth contribute to emotional health through increased self-esteem and self-confidence.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
		Discuss job possibilitie of two applicants with equal qualifications exc that one has a clean, attractive smile and the other displays dirty or decayed teeth when he smiles. Film: "It's Your Health Available from the Ameri Dental Association, 211 East Chicago, Ave., Chic Ill., 60611. black and white. Shows how a star halfback fails the Annapolis dental examina (Order number: DH8)
D. Problems associated with changing status	The problems associated with improving the dental health status are complex and difficult to change because prevention and correction of dental disease depends upon the motivation of individuals. The greatest challenge to changing dental health standards is to get people to accept and apply known preventive practices.	Discuss the reasons why some people do not secur dental care, such as fea ignorance, misconception and their system of valu Discuss some of the reasons why motivating people to take care of their teeth is difficult Example: -the inability to envisi future problems while i apparent good health.

MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	Discuss job possibilities of two applicants with equal qualifications except that one has a clean, attractive smile and the other displays dirty or decayed teeth when he smiles. Film: "It's Your Health." Available from the American Dental Association, 211 East Chicago, Ave., Chicago, Ill., 60611. black and white. Shows how a star halfback fails the Annapolis dental examination. (Order number: DH8)	
The problems associated with improving the dental health status are complex and difficult to change because prevention and correction of dental disease depends upon the motivation of individuals. The greatest challenge to changing dental health standards is to get people to accept and apply known preventive practices.	Discuss the reasons why some people do not secure dental care, such as fear, ignorance, misconceptions, and their system of values. Discuss some of the reasons why motivating people to take care of their teeth is difficult. Example: -the inability to envision future problems while in apparent good health.	Most dental health problems may be prevented with present knowledge of prevention and control of dental illnesses. Dental health education must provide an understanding of the factors involved in maintaining oral health and it must stimulate the desire to practice what is known. Many people are unwilling to take the time for proper dental care.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
	Indifference and complacency toward dental health practices are difficult to overcome.	
	Good dental health practices require persistent daily attention.	
II. Characteristics of Oral Structures		
A. Lifetime possibilities	The oral structures were meant to serve throughout life.	Review: development of the temporary and permanent teeth from the elementary curriculum.
B. Importance of teeth	Adequate nutrition is dependent upon sound teeth.	Discuss the importance of 1. The mechanical breakdown of food 2. The tongue in chewing and swallowing
C. Uniqueness of two dentitions	The two sets of teeth are the first set, called temporary, deciduous, or primary; and the second set, called permanent teeth.	Stress: importance of the 6-year molars and the misconception often held that the 6-year molars are "baby" molars and will be replaced.
1. Relationship to growth and development	The teeth are unique body structures which serve the body's changing needs of growth and development.	Stress: the 6-year permanent molars contribute to the shape of the lower part of the face, and the position of the teeth.

JOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
ifference and complacency ard dental health tices are difficult vercome.		Since cavities continue to develop, greater attention must be focused on *prevention* of dental disease.
l dental health practices ire persistent daily ntion.		
oral structures were t to serve through- life.	Review: development of the temporary and permanent teeth from the elementary curriculum.	
uate nutrition is ndent upon sound teeth.	Discuss the importance of 1. The mechanical breakdown of food 2. The tongue in chewing and swallowing	
two sets of teeth are first set, called orary, deciduous, or ary; and the second called permanent n.	Stress: importance of the 6-year molars and the misconception often held that the 6-year molars are "baby" molars and will be replaced.	Tooth buds begin to form in the jaws early in prenatal life. Unlike other organs that grow as the body grows, the temporary teeth develop with the growth of the jaws.
teeth are unique body ctures which serve the 's changing needs of th and development.	Stress: the 6-year permanent molars contribute to the shape of the lower part of the face, and the position of the teeth.	The jaws of a child are not large enough to accommodate the permanent teeth he will need in adult life. Contrary to widely-held belief, the

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPP
	Since they serve the body's needs only a short time, the structure of the temporary teeth is not as defined as that of the permanent teeth.	Compare the short length of time the temporary teeth must fulfill body needs to the much longer time the permanent teeth serve.	tempor dental set.
2. Shedding of temporary teeth	Exfoliation or shedding of the temporary teeth occurs by the process of root resorption.	Use models of the temporary and permanent dentitions to demonstrate the refinement in structure between the two sets.	When t enlarg more c teeth renlac harder the pe
	The 20 temporary teeth are replaced by permanent teeth, and normally 12 additional permanent molars erupt to complete the second set.	Root resorption can be demonstrated by a series of transparencies that show how the temporary root disappears with pressure from the emerging permanent crown. Secure an exfoliated temporary tooth and point out the small amount of root structure remaining.	The er presse the te causin root. increa well d teeth jaws.
D. Uniqueness of dental construction	Some of the unique characteristics help maintain dental health; others make the mouth and teeth vulnerable to disease.	Using a model dentition, point out that the contour of the arches toward the cheeks creates a vestibule where food remains after mastication.	Teeth skelet part o The te fied a that t shape

MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
nce they serve the body's eeds only a short time, he structure of the mporary teeth is not as efined as that of the ermanent teeth.	Compare the short length of time the temporary teeth must fulfill body needs to the much longer time the permanent teeth serve.	temporary set needs as good dental care as the permanent set.
xfoliation or shedding of he temporary teeth occurs the process of root esorption.	Use models of the temporary and permanent dentitions to demonstrate the refinement in structure between the two sets.	When the child's jaws have enlarged and the diet becomes more complex, the temporary teeth exfoliate and are replaced by the larger, harder, stronger teeth of the permanent dentition.
he 20 temporary teeth re replaced by permanent eeth, and normally 12 dditional permanent molars rupt to complete the econd set.	Root resorption can be demonstrated by a series of transparencies that show how the temporary root disappears with pressure from the emerging permanent crown. Secure an exfoliated temporary tooth and point out the small amount of root structure remaining.	The erupting permanent crown presses against the root of the temporary teeth above it, causing the resorption of the root. Pressure from the bite increases with age requiring well developed, healthy first teeth properly aligned in the jaws.
ome of the unique characteristics help maintain ental health; others make he mouth and teeth ulnerable to disease.	Using a model dentition, point out that the contour of the arches toward the cheek creates a vestibule where food remains after mastication.	Teeth are attached to the skeleton but do not form part of it. The teeth of man are classified as heterodont, meaning that the dentition varies in shape and function.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
1. The dental arches		Use a mortar and pestle to demonstrate the principle of crushing and grinding action. Demonstrate with a stone cast (obtained by child from his dentist or from the dental hygiene teacher) how irregular alignment of teeth or rough tooth surfaces make cleaning difficult.
	Human teeth are well constructed and ideally situated in the jaws for their specific functions but they are not self-cleansing.	

NDERSTANDINGS AND MENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
H c b o p		Human teeth are capable of chewing all types of food because of the different types of surfaces on incisors, cuspids, bicuspids, and molars.
N o t r T b t c	Use a mortar and pestle to demonstrate the principle of crushing and grinding action. Demonstrate with a stone cast (obtained by child from his dentist or from the dental hygiene teacher) how irregular alignment of teeth or rough tooth surfaces make cleaning difficult.	Normally, individual teeth of one arch dovetail between those of the opposing arch rather than meeting in points. This arrangement brings the broad surfaces together for the crushing of food in mastication.
Th ea un it		The particular function that each tooth performs is dependent upon the form of the tooth and its position in the jaw.
In or la to of fo be su al	th are well con- and ideally in the jaws for cific functions are not self-	In animals, teeth are conical or cylindrical in shape, largest at the neck of the tooth. There are seldom areas of retention or stagnation of food or bacterial masses between the teeth. The entire surface is cleaned automatically by masticatory force.
Hu ta is bit the the not		Human teeth are bell-shaped or tapering and the largest part is toward the chewing and biting surfaces. Because of the form and arrangement of the teeth, the human mouth is not self-cleansing.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	S
2. Enamel	Tooth enamel provides protection for the softer internal tissues. Enamel is incapable of self-repair when it is broken by disease or injury.	Film: "Our Teeth." Available from the Film Library, State Department of Health, 84 Holland Ave., Albany, N.Y. Shows growth and organic structure and reasons for oral hygiene. Study dental tissues under the microscope. Compare density of enamel, dentin, and cementum. Look for tubules in the dentin and the contents of the pulp chamber.	En in ca kn in in ab ti be ha Wh en pe no On an ti an th ta a w th su On mo wh of
3. Dentin	Located under the hard cover of the enamel, dentin provides some resiliency for the living and changing inner tissues of the tooth.	The dental tissues can be demonstrated on a mock-up tooth model that separates to reveal the internal tissues or by making transparencies with overlays for each of the tissues.	De of ca of fo ab to fr

S	UNDERSTANDINGS AND DAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
En	enamel provides pro- in n for the softer cal al tissues. kno ind is incapable of ins epair when it is abr by disease or tic . ben haz	Film: "Our Teeth." Available from the Film Library, State Department of Health, 84 Holland Ave., Albany, N.Y. Shows growth and organic structure and reasons for oral hygiene.	Enamel is the hardest substance in the body and the most highly calcified organic substance known. It is about 97-98% inorganic. The smooth, hard insensitive substance resists abrasive effects of mastication and protects the tissues beneath it from external hazards and irritants.
	Whe ena per not	Study dental tissues under the microscope.	When tooth decay destroys the enamel, the destruction is permanent since the tooth can not form new enamel.
	Onc and tic any the tal a w the sup	Compare density of enamel, dentin, and cementum. Look for tubules in the dentin and the contents of the pulp chamber.	Once tooth enamel is formed and calcified, the calcification is never decreased by any physiologic process within the tooth. The old wives' tale that pregnancy produces a withdrawal of calcium from the teeth of the mother is not supported by factual evidence.
	Onc mor whi of		Once enamel is calcified, no more enamel is formed and that which is formed is incapable of regeneration.
	Den d under the hard of of the enamel, cal provides some of ency for the living for anging inner tissues abs tooth. toc fro	The dental tissues can be demonstrated on a mock-up tooth model that separates to reveal the internal tissues or by making transparencies with overlays for each of the tissues.	Dentin is about the consistency of bone, being about 75 percent calcified. It forms the bulk of the tooth and gives it its form. Very small canals which absorb nourishment for the tooth penetrate the dentin from the dental pulp.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SU
4. Cementum	Cementum covers the root as the enamel covers the crown. It is less dense than enamel and is protected by gum tissue. When the gums recede and expose the tooth root to decay, it can proceed much faster in the cementum than in the enamel.		Cem cal too per int and the is inf Bec har exp sen
5. Pulp	Vital life functions of the tooth are carried out within the pulp chamber. The blood vessels carry nourishment and oxygen to the tooth, and the lymphatic ducts carry away waste products. Nerves in the pulp register all sensations they receive as pain.		The bil pro bac Ner war onl of ini
6. Alveolar bone	Alveolar bone cradles the teeth and grows or diminishes in size and strength according to pressure exerted upon the teeth. Its ability to grow and change is important in the treatment of malocclusion and periodontal disease.	Obtain models from the supervising dentist or dental hygiene teacher to demonstrate effects of normal and abnormal pressures on teeth and supporting bone.	The rat bon bec vig and its stru lati

STANDINGS AND AL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
ers the root el covers the s less dense and is pro- m tissue.		Cementum is about 46 percent calcified. It attached the tooth to the fibers of the periodontal membrane. There is interchange between the cementum and tissues in other parts of the body; therefore the cementum is a focal point of possible infection.
ns recede and ooth root to n proceed much e cementum enamel.		Because cementum is not as hard as enamel, when it is exposed the tooth may become sensitive.
unctions of the rried out with- chamber. The s carry nour- oxygen to the e lymphatic away waste erves in the r all sensa- eceive as pain.		The pulp has the unique capability of creating dentin to protect itself in response to bacterial invasion or trauma. Nerves in the pulp provide warnings of disturbance. The only reaction of the nerves of the pulp, however, is to initiate pain.
e cradles the ows or dim- ize and ording to rted upon the	Obtain models from the supervising dentist or dental hygiene teacher to demonstrate effects of normal and abnormal pressures on teeth and supporting bone.	The alveolar bone is a thin, rather frail formation of bone; however, it tends to become stronger with the vigorous exercise of chewing and tends to resorb or lose its strength and mineral structure without the stimulation of exercise.
to grow and portant in the malocclusion al disease.		

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPP
7. Periodontal membrane and fibers	The periodontal membrane provides the tooth with a cushion against shock. The teeth loosen in their sockets when the tiny fibers of the periodontal membrane are destroyed. Dentists recommend brushing the teeth the way they grow (away from the gums) to avoid destroying these tiny fibers which attach the gums to the necks of the teeth.	Use models to help show what happens when food is allowed to remain on the necks of the teeth, or becomes lodged between the gum margin and the neck of the tooth.	The pe very t attach boney minute medium tooth and re and co indivi upon t tappin The cu fibers withst pounds by clo chewin
8. Gingivae (gums)	Health of the teeth cannot be separated from the health of the gums. Gums are very sensitive indicators of general physical conditions. Any deviation in the health of the gums indicates a problem that should be reported to the physician or dentist. Regular and proper tooth-brushing helps keep the gums healthy.	Demonstrate the effects of proper brushing on gingival health.	Gums (sion o that l attach bone a teeth. size, gums m distur functi well a toothb increa gums w injuri

TANDINGS AND L CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
al membrane tooth with a st shock. sen in their the tiny periodontal destroyed. mmend brush- the way they om the gums) roying these hich attach he necks of	Use models to help show what happens when food is allowed to remain on the necks of the teeth, or becomes lodged between the gum margin and the neck of the tooth.	The periodontal membrane is a very thin membrane which attaches the tooth to the boney socket by a series of minute fibers. It is the medium through which the tooth is nourished, it forms and regenerates the cementum, and communicates to the individual the pressure placed upon the teeth by chewing, tapping, etc. The cushioning effect of the fibers allows the tooth to withstand the hundreds of pounds of pressure caused by closing the jaws and chewing.
teeth cannot from the gums. sensitive general itions. in the health ndicates a should be he physician roper tooth- s keep the	Demonstrate the effects of proper brushing on gingival health.	Gums (gingivae) are an extension of the mucous membrane that lines the mouth. They attach to both the alveolar bone and to the surface of the teeth. Any deviation in either size, color, or shape of the gums may indicate disease or disturbance in the normal functioning of the body as well as the teeth. Proper toothbrushing and massage increases tissue tone of the gums which protects them from injuries.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
9. Cuspid roots	Roots of the cuspids are the longest in the mouth and provide the foundation of the face. Fortunately, the cuspids are among the least susceptible to decay, for the facial contour changes when they are lost.	Show the effects of malalignment of cuspids or missing cuspids on facial appearance. [The effect of causing facial contour to sag might be compared to the appearance of a baby before the teeth erupt, or to an old person who wears no denture to replace his lost natural teeth.]
10. The lower jaw	The lower jaw (mandible) is the only large movable bone in the skull. Articulation of the jaws permits a variety of movements which contribute to efficient mastication and facial expression.	Use a skull model to show the insertion of the mandible in the temperomandibular joint. Ask the students to experience the various types of movements of the lower jaw listed in the supplementary information. A dentist may lend a dentition with an articulator that is adjustable and will show the effects of slight alterations of the joint angles upon the biting relationships. A local dentist might supply X rays showing impacted third molars. If X rays can

DERSTANDINGS AND ENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
the cuspids are st in the mouth de the founda- he face. ly, the cuspids the least sus- to decay, for the ntour changes are lost.	Show the effects of mal-alignment of cuspids or missing cuspids on facial appearance. [The effect of causing facial contour to sag might be compared to the appearance of a baby before the teeth erupt, or to an old person who wears no denture to replace his lost natural teeth.]	The length of the roots of the cuspids is important to the stabilization of the dental arches and to the esthetic effect of rounding out the face at the corners of the mouth. There is a drastic effect upon appearance when the cuspids are lost.
jaw (mandible) is large movable bone ull. on of the jaws variety of move- ch contribute to mastication and pression.	Use a skull model to show the insertion of the mandible in the temperomandibular joint. Ask the students to experience the various types of movements of the lower jaw listed in the supplementary information. A dentist may lend a dentition with an articulator that is adjustable and will show the effects of slight alterations of the joint angles upon the biting relationships. A local dentist might supply X rays showing impacted third molars. If X rays can	The lower jaw is the heaviest and strongest bone of the head. It serves as a framework for the floor of the mouth. The mouth is opened and closed by raising and lowering the mandible by the four sets of muscles of mastication. Most animals can move the jaws only up and down but the joint of the human jaw allows several types of movement. The movements possible are: 1. down 2. up 3. forward 4. backward 5. laterally to the right and left.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPP
		not be secured, transparencies can be made to illustrate this problem.	
11. The third molars (wisdom teeth)	The third molars are the most unpredictable teeth in the human mouth. They are frequently the source of problems including impaction.		The t likel numbe any o Impac abnor alveo erupt Commo (one genit
III. The problem of dental caries			
A. Prevalence	Dental caries is the most prevalent chronic disease affecting mankind.	Film: "Dentistry Through the Age of Man." Available from the American Dental Association, Bureau of Audiovisual Service, 211 East Chicago Ave., Chicago, ill. color, 1964. Order number" DH72. Rental price: $1.50. Contrasts modern dentistry with that of prehistoric man. Relate a few of the historical facts supplied in the supplementary information.	Tooth of ma years the S caries caries of Rh to ha ago. Refere can be of Hip B.C.) B.C.) B.C.)
1. Historical	Records indicate that dental decay has plagued both civilized and uncivilized peoples. For thousands of years people have tried to replace their lost natural teeth with artificial ones.		

UNDERSTANDINGS AND MENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	not be secured, transparencies can be made to illustrate this problem.	
molars are the redictable teeth uman mouth. frequently the problems includ-tion.		The third molars are more likely to vary in form, shape, number of roots, etc., than any other teeth. Impaction means the tooth is abnormally imbedded in the alveolar bone preventing its eruption. Commonly the third molars (one or all four) are congenitally missing.
ries is the most chronic disease mankind. ndicate that den- has plagued both and uncivilized ands of years ve tried to replace t natural teeth ficial ones.	Film: "Dentistry Through the Age of Man." Available from the American Dental Association, Bureau of Audiovisual Service, 211 East Chicago Ave., Chicago, ill. color, 1964. Order number" DH72. Rental price: $1.50. Contrasts modern dentistry with that of prehistoric man. Relate a few of the historical facts supplied in the supplementary information.	Tooth decay has been a problem of mankind for thousands of years. Specimens dating from the Stone Age have revealed caries in the teeth. Dental caries occurred in the teeth of Rhodesian man, estimated to have lived 250,000 years ago. References to dental operations can be found in the writings of Hippocrates (5th century B.C.), Aristotle (4th century B.C.), and Galen (2nd century B.C.).

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
	Although dental science has made great progress in recent years, dental problems are as prevalent in our generation as they were thousands of years ago.	Ask students why it is important to study the incidence of tooth decay among different societies and people to understand why some are immune.

STANDINGS AND AL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
		Individual dental operations have been practiced almost from the beginning of civilization. Specimens of dental work in the shape of natural teeth bound together with gold or artificial teeth of ivory, bone, wood or stone, attached to natural ones by gold or silver bands have been found in the jaws of mummies entombed as early as the 6th century B.C. False teeth were probably common in Rome at the beginning of the Christian era for they are mentioned in the writings of Horace, Ovid, and Cicero. A book written by a physician, Mesua, in 857 advised treatment of tooth decay by essentially the same methods dentists today use to drill and fill teeth. Mesua advised removing tooth decay by scratching and cleaning with a chisel, knife, or file and then filling the cavity with gold leaf.
al science t progress rs, dental as prevalent tion as they s of years	Ask students why it is important to study the incidence of tooth decay among different societies and people to understand why some are immune.	

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPP
2. Present	There are only a few people in a few areas of the world today who are not affected by dental decay.		Denta peopl devel world the i free the H coast tribe Zulus Eskim of ca
B. Proneness to decay	A number of factors are involved in the proneness of races, individuals, and particular teeth, to dental decay.	Assign a group to investigate and report on studies by Dr. F.S. McKay in Deaf Smith County, Texas, in the late 1920's that led to current theories and use of fluoride in decay prevention.	There immun the m less is be dieta race. and u them faces are r
	Many of these factors are being studied to determine the role each plays as a cause of dental decay.	Have students survey members of their own families and compare variations in susceptibility among different members.	Denta areas if an promot decay
	Some of the facts that we do know regarding proneness to dental decay are: 1. People who live in areas where fluoride is naturally present in drinking water supplies have significantly less tooth decay than others.	Discuss and point out on pictures or models of teeth the most susceptible teeth and tooth surfaces and have students consider and compare their own caries experiences. Pinpoint on a map of the United States areas in	In the a gene caries whole variat differ

UNDERSTANDINGS AND AMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
re only a few in a few areas of ld today who are ected by dental		Dental decay still affects people in all parts of the developed and underdeveloped world. The only areas where the inhabitants are practically free from tooth decay are in the Hebrides Islands off the coast of Scotland. A few tribes of the South African Zulus and some Alaskan Eskimos are relatively free of caries.
r of factors are d in the proneness s, individuals, ticular teeth, to decay.	Assign a group to investigate and report on studies by Dr. F.S. McKay in Deaf Smith County, Texas, in the late 1920's that led to current theories and use of fluoride in decay prevention.	There is no complete racial immunity to the disease but the more primitive people have less decay than others. This is believed to be due to dietary factors more than to race. Their food is tough and uncooked which gives them teeth with smooth surfaces and tough gums which are resistant to infection.
these factors are tudied to determine e each plays as a f dental decay.	Have students survey members of their own families and compare variations in susceptibility among different members.	Dental researchers are studying areas of the world to determine if any geographic differences promote immunity to dental decay.
the facts that we regarding prone- dental decay are: ople who live in eas where fluoride naturally present drinking water pplies have signi- cantly less tooth cay than others.	Discuss and point out on pictures or models of teeth the most susceptible teeth and tooth surfaces and have students consider and compare their own caries experiences. Pinpoint on a map of the United States areas in	In the United States there is a general prevalence of dental caries for the country as a whole; however, considerable variations exist between different areas and among

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
	2. Females are slightly more prone to dental decay than males. 3. Certain teeth and tooth surfaces are more susceptible to earlier and more severe attack of dental caries than other teeth and surfaces. 4. People of our society are more prone to decay than people of more primitive societies whose diets are not so refined as ours.	the Southwest where natural supplies of drinking water contain higher concentrations of fluoride salts.

RSTANDINGS AND TAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
s are slightly rone to dental than males. n teeth and surfaces are usceptible to r and more attack of dental than other and surfaces. of our society re prone to than people of rimitive ies whose diets t so refined s.	the Southwest where natural supplies of drinking water contain higher concentrations of fluoride salts.	different population groups. Tooth decay is significantly more prevalent in children and young adults in the Middle Atlantic and New England states than in any other region of the country. In the South Central states where natural fluorides abound, there is significantly less decay. White persons appear to have more evidence of decay than Negroes. Females are said to be slightly more susceptible to tooth decay than males, possibly because their teeth erupt a few months earlier and are exposed to the possibility of decay longer. Very few individuals seem to have an immunity to decay. Susceptibility varies markedly among members of the same family; one family member may be completely free of decay while another one is extremely susceptible. Identical twins exhibit very similar patterns of caries, but we do not know the significance of genetic influences on dental health.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUP
		Essential factors for initiation of a carious lesion: 1) caries-susceptible individual; 2) acid-producing bacteria; 3) orally fermentable carbohydrates; 4) appropriate bacterial enzymatic system; 5) a bacterial plaque.	Indiv those to de and a non-s devel cavit incis then the m lower suffe pits and a front frequ
C. Process	The exact cause or causes of decay are not known. Many factors contribute to the decay process. Among these are: 1. developmental and systematic disturbances may result in vulnerable teeth 2. dental plaque 3. mouth bacteria 4. the role of acids 5. the role of saliva 6. the role of food 7. irregular alignment 8. gum disorders 9. poor habits 10. emotional tensions, such as bruxism	Construct a chain of decay. Each factor that contributes to the decay process can be written or pictured on an individual link made of construction paper. Other pictures or words can be added to show how each link in the chain can be broken to limit the decay. Structural irregularities such as pits, fissures, and grooves can be shown on a model of a single tooth (bicuspid or molar) or on	The d of ev Decal struc sive start the e into It is the p link broke preve Denta the o gener it ca that

MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	Essential factors for initiation of a carious lesion: 1) caries-susceptible individual; 2) acid-producing bacteria; 3) orally fermentable carbohydrates; 4) appropriate bacterial enzymatic system; 5) a bacterial plaque.	Individual teeth, and areas of those teeth, are more prone to decay than other teeth and areas. Generally, the non-self-cleansing areas develop the first and most cavities. The molars, upper incisors and bicuspids and then the lower bicuspids suffer the most, in that order. The lower incisors and the cuspids suffer the least decay. The pits and fissures of the molars and around the necks of the front teeth are the areas most frequently attacked.
The exact cause or causes of decay are not known. Many factors contribute to the decay process. Among these are: 1. developmental and systematic disturbances may result in vulnerable teeth 2. dental plaque 3. mouth bacteria 4. the role of acids 5. the role of saliva 6. the role of food 7. irregular alignment 8. gum disorders 9. poor habits 10. emotional tensions, such as bruxism	Construct a chain of decay. Each factor that contributes to the decay process can be written or pictured on an individual link made of construction paper. Other pictures or words can be added to show how each link in the chain can be broken to limit the decay.	The decay process is a chain of events. Decalcification of the tooth structure by caries is progressive and irreversible. Once started it proceeds through the enamel, the dentin, and into the dental pulp. It is important to understand the process because if any link in the chain can be broken, we may be able to prevent caries.
	Structural irregularities such as pits, fissures, and grooves can be shown on a model of a single tooth (bicuspid or molar) or on	Dental decay always begins on the outside of a tooth, generally in the enamel, but it can occur in cementum if that portion is exposed.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SU
	Foods may cling to tooth pits, fissures, and grooves.	a model of a complete dentition.	
1. Structural vulnerability	The teeth are structurally vulnerable to caries. Tooth enamel is extremely strong and can withstand tremendous biting pressures but acids quickly and permanently destroy its mineral substance. Any weakness in either the enamel or cementum coverings allows bacteria a swift entrance into the inner tissues. Irregular tooth surfaces formed by pits, fissures, and grooves are areas that retain food particles. Areas where teeth wedge against one another are vulnerable to the decay process. Methods of strengthening the weak areas will be discussed under prevention. Proper toothbrushing, rinsing, and dental floss will remove food that clings to irregular surfaces.	Have a dental hygiene teacher demonstrate steps in proper toothbrushing: 1. choice and care of brushes 2. brushing techniques 3. rinsing thoroughly 4. frequency and time for brushing Distribute a home performance chart covering a period of 1 week.	Tooth proce eithe fever the p ment, forma

SU	UNDERSTANDINGS AND DAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	ay cling to tooth issures, and grooves.	a model of a complete dentition.	
ooth roce ithe ever he p ent, orma	th are structurally ble to caries.		Tooth formation is a metabolic process and any disturbance, either nutritional or by fever or other illness during the period of enamel development, can result in imperfect formation of tooth structure.
	namel is extremely and can withstand ous biting pressures ds quickly and ntly destroy its substance.		
	kness in either mel or cementum gs allows bacteria entrance into the issues.	Have a dental hygiene teacher demonstrate steps in proper toothbrushing: 1. choice and care of brushes 2. brushing techniques 3. rinsing thoroughly 4. frequency and time for brushing	
	ar tooth surfaces y pits, fissures, oves are areas tain food particles.	Distribute a home performance chart covering a period of 1 week.	
	here teeth wedge one another are le to the decay		
	of strengthening areas will be dis- nder prevention.		
	oothbrushing, rinsing, al floss will remove t clings to r surfaces.		

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
2. Dental plaque	Dental decay begins under the gelatinous, invisible, dental plaque that forms on teeth. The plaque acts as a sponge by holding the attaching acid against the tooth surface. Toothbrushing after eating is recommended so that the plaque is removed and can not hold acid on the tooth.	Film: "Laurie Learns a Secret." Available from the Film Library, State Department of Health, 84 Holland Ave., Albany, N.Y. color, 17 min., 1960. Illustrates the dental plaque. This demonstration might be assigned to one student or to a small group. Participation by the entire class during the class period may not be practical; however, they might like to do the activity at home. The dental plaque can be stained to make it visible. Explain that the student should do a better job of toothbrushing in the areas that show stain. The school dental hygiene teacher may be able to supply disclosing tablets or solution and help with the activity. A disclosing solution can be made and used as follows: 1. Dissolve 6 grams of basic fuchsin in 100 ml of 95% ethyl alcohol. 2. Mix about 12-15 drops of the solution in 2 ounces of water.

ERSTANDINGS AND NTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
ay begins under nous, invisible, que that forms acts as a holding the acid against surface. ing after eating nded so that the removed and can cid on the tooth.	Film: "Laurie Learns a Secret." Available from the Film Library, State Department of Health, 84 Holland Ave., Albany, N.Y. color, 17 min., 1960. Illustrates the dental plaque. This demonstration might be assigned to one student or to a small group. Participation by the entire class during the class period may not be practical; however, they might like to do the activity at home. The dental plaque can be stained to make it visible. Explain that the student should do a better job of toothbrushing in the areas that show stain. The school dental hygiene teacher may be able to supply disclosing tablets or solution and help with the activity. A disclosing solution can be made and used as follows: 1. Dissolve 6 grams of basic fuchsin in 100 ml of 95% ethyl alcohol. 2. Mix about 12-15 drops of the solution in 2 ounces of water.	Gelatinous plaques start as invisible films which contain acids and large amounts of bacteria and food debris. They form in the mouth, especially after meals. They firmly adhere to the surfaces of teeth and can build up into a thick mass that is grossly visible in non-self-cleansing areas. When food is taken into the mouth; the bacteria in the mouth release enzymes (catalytic agents) which break the food down into lactic and other acids. The acid is held on the tooth surface by the plaque.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPL
		3. Swish the mixture thoroughly about the mouth. 4. View the plaque which will be stained red. 5. Brush the teeth thoroughly to remove all traces of the stain. 6. Rinse the mouth again with the mixture. 7. Inspect again to see if any remnants of the plaque were missed by brushing.	
3. Mouth bacteria	Under certain conditions commonly present, mouth bacteria produce acids harmful to tooth structure. If the acid-forming bacteria in the mouth can be reduced in numbers, less acid would be produced and less decay would result. Although studies have been made of various methods for controlling the number of lactobacillus bacteria that cause tooth decay, at present the most effective way known for inhibiting bacterial growth is by toothbrushing.	Discuss dentifrice claims that they "kill" mouth bacteria. Take a Lactobacillus colony count. Materials needed: 1. Sterile saline solution 2. Sterile test tubes 3. Petri dishes 4. Pipettes 5. Agar medium (sterile) 6. Incubator (or use a warm place) Procedure: 1. Secure saliva sample or separate samples from persons with different caries susceptibility.	The hum habitat bacteri harmles conditi Lactoba acid-pr believe respons and is saliva A cause has bee ber of mouth a decay f Some st followi between lactoba

ERSTANDINGS AND NTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
	3. Swish the mixture thoroughly about the mouth. 4. View the plaque which will be stained red. 5. Brush the teeth thoroughly to remove all traces of the stain. 6. Rinse the mouth again with the mixture. 7. Inspect again to see if any remnants of the plaque were missed by brushing.	
in conditions esent, mouth oduce acids ooth	Discuss dentifrice claims that they "kill" mouth bacteria.	The human mouth is the natural habitat for various kinds of bacteria, most of which are harmless except under certain conditions.
-forming the mouth ed in numbers, uld be pro- ss decay .	Take a Lactobacillus colony count. Materials needed: 1. Sterile saline solution 2. Sterile test tubes 3. Petri dishes 4. Pipettes 5. Agar medium (sterile) 6. Incubator (or use a warm place)	Lactobacillus acidophilus, an acid-producing bacteria is believed to be primarily responsible for dental caries and is normally present in the saliva of all mouths.
dies have various controlling f lactobacillus t cause tooth esent the most y known for acterial toothbrushing.	Procedure: 1. Secure saliva sample or separate samples from persons with different caries susceptibility.	A cause and effect relationship has been found between the number of these organisms in the mouth and the extent of dental decay found in the same mouth. Some studies have shown the following relationships between number of colonies of lactobacillus and the extent

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUP
	Scientific evidence does not support the claims that toothpaste or mouthwash can significantly reduce or destroy mouth bacteria. Toothpaste and mouthwashes do not kill bacteria but serve to make brushing the teeth more pleasant. The only therapeutic agent that has been added to toothpaste that has been proved to be effective is fluoride which reacts with the tooth to make it more resistant to the action of acid formed by mouth bacteria.	2. Mix 1 ml. of saliva with 9 ml. saline sol. 3. From the 1:10 mixture make other mixtures in the ratios of 1:100 and 1:1000. With pipettes transfer 1 ml. of each dilution to the next 9 ml. of sterile saline. 4. Transfer 0.1 ml. of each sample to an agar plate. 5. Incubate agar plates at 37.5°C. for 2 or 3 days or put in a warm place. 6. Compare number of colonies on each plate according to dilution. 7. On plates containing 50-100 colonies count the colonies and estimate the total number of L.A. per ml. of undiluted saliva.	of Col per und 2,0 ove The age bac as dec
4. Acids	Many acids can contribute to dental decay. Both the amount and strength of the acid formed by mouth bacteria play a role in how quickly decay occurs.	Color test for acid in the mouth: Materials needed: 1. toothpicks 2. microscope and slides 3. methyl red 4. sugar	The fro car as as

SUP	R UNDERSTANDINGS AND NDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
of	tific evidence does upport the claims that paste or mouthwash ignificantly reduce stroy mouth bacteria.	2. Mix 1 ml. of saliva with 9 ml. saline sol. 3. From the 1:10 mixture make other mixtures in the ratios of 1:100 and 1:1000. With pipettes transfer 1 ml. of each dilution to the next 9 ml. of sterile saline.	of decay: Colonies of L.A. per ml of saliva — Extent of decay under 2,000 — very little 2,000-10,000 — moderate decay over 10,000 — extensive decay
Col per			
unde 2,0	paste and mouthwashes t kill bacteria but to make brushing eeth more pleasant.		
ove			
The ager bact as a deca	nly therapeutic that has been added othpaste that has proved to be effective oride which reacts the tooth to make it resistant to the n of acid formed uth bacteria.	4. Transfer 0.1 ml. of each sample to an agar plate. 5. Incubate agar plates at 37.5°C. for 2 or 3 days or put in a warm place. 6. Compare number of colonies on each plate according to dilution. 7. On plates containing 50-100 colonies count the colonies and estimate the total number of L.A. per ml. of undiluted saliva.	The search for an antibacterial agent that will inhibit mouth bacteria merits consideration as a means of reducing dental decay.
The from carb as t as l	acids can contribute ntal decay. the amount and strength e acid formed by mouth ria play a role in how ly decay occurs.	Color test for acid in the mouth: Materials needed: 1. toothpicks 2. microscope and slides 3. methyl red 4. sugar	The formation of lactic acid from the fermentation of carbohydrates was suggested as the cause of tooth decay as long ago as 1887.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPL
	Other factors that determine the extent of damage to the teeth are the length of exposure of the acid on the tooth surfaces and the frequency with which the teeth are subjected to the acid attacks. A measurable reduction in tooth decay can be achieved by eliminating or using in moderation those foods that are quickly converted into acid in the mouth.	Procedure: 1. With a toothpick remove material from around the necks of the teeth. 2. Arrange the material in a 1/4-inch doughnut-shaped circle on the slide. 3. Over and around the outer rim of the circle, place a few drops of 0.02% aqueous methyl red. (20 mg. soluble methyl red in 100 mg. of water.) 4. Place a few grains of sugar inside the circle. 5. The indicator will turn red if acid is formed. Rapidity of the color change indicates acid production and caries susceptibility. Do this color list at different times after eating and brushing.	By 191 people immune saliva alkali Citric damagi In exp were d acid, struct 5 days The U.S destroy follow with th to the Citric Phosph Lactic Acetic Benzoi Tartar Carbon
5. Saliva	Oral hygiene is related to saliva flow. The amount and composition of the saliva influence naturai mouth cleanliness.	Ask the students to sample a variety of foods and describe the saliva flow that results. A good range of food might include: marshmallows, peanut butter and	Saliva all the The mou when th than wh

UNDERSTANDINGS AND MENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
ictors that determine nt of damage to the e the length of ex- f the acid on the rfaces and the fre- ith which the teeth ected to the acid	Procedure: 1. With a toothpick remove material from around the necks of the teeth. 2. Arrange the material in a 1/4-inch doughnut-shaped circle on the slide. 3. Over and around the outer rim of the circle, place a few drops of 0.02% aqueous methyl red. (20 mg. soluble methyl red in 100 mg. of water.) 4. Place a few grains of sugar inside the circle. 5. The indicator will turn red if acid is formed. Rapidity of the color change indicates acid production and caries susceptibility.	By 1915 it had been shown that people who were relatively immune to dental decay had saliva that was somewhat alkaline in content. Citric acid is especially damaging to tooth structure. In experiments where teeth were deposited in citric acid, 80 percent of the tooth structure was dissolved in 5 days.
able reduction in cay can be achieved nating or using in on those foods that kly converted into the mouth.	Do this color list at different times after eating and brushing.	The U.S.P.H.S. ranks tooth-destroying acids in the following order from those with the most damaging effect to the least. Citric (hard candies) Phosphoric (soft drinks) Lactic (produced in mouth by bacteria) Acetic (vinegar is weak acetic acid) Benzoic Tartaric Carbonic
ene is related to ow.	Ask the students to sample a variety of foods and describe the saliva flow that results. A good range of food might include: marsh-mallows, peanut butter and	Saliva is a mixed secretion from all the salivary glands.
t and composition liva influence outh cleanliness.		The mouth is relatively cleaner when there is an abundant flow than when there is a scanty flow.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPL
	Saliva has three important functions which are related to the prevention of dental caries. They are: a. washing action b. action as a chemical inhibitor c. buffering capacity The American habit of ending the meal with sweet desserts causes a thick and ropy saliva which helps to hold the sugar and acid in the mouth. Like all other body functions, the salivary flow and its natural cleansing action slow down during sleep, so it is especially important that the teeth be cleaned before retiring.	crackers, caramels, bread, nuts, potato chips, celery, apple, and carrot.	Saliva differ rate o The sa by die Acid a a free Sweets saliva and te teeth. Secret sight foods, tion o and sm Secret emotio tion, Rampan often a "dry mouth washin Severa in sal of bac buffer strong and st ones.

PPL	DERSTANDINGS AND FNTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
iva	three important	crackers, caramels, bread,	Saliva varies greatly in
fer	which are related	nuts, potato chips, celery,	different people in amount,
e o	evention of dental	apple, and carrot.	rate of flow, and character.
sa			The salivary flow is influenced
die			by diet and other factors.
	ng action		
d a	on as a chemical		Acid and tart foods stimulate
ree	bitor		a free flow of watery saliva.
ets	ering capacity		Sweets stimulate a low
iva			salivary flow that is thick
te	can habit of end-		and tends to adhere to the
th.	eal with sweet		teeth.
	causes a thick		
ret	saliva which		Secretion is increased by the
ht	old the sugar and		sight and smell of certain
ds,	e mouth.		foods, by mastication, irrita-
n o			tion of the mucous membranes,
sm	ther body		and smoking.
	the salivary		
ret	ts natural		Secretion is decreased by
tio	action slow		emotions, fever and dehydra-
n,	g sleep, so it		tion, and certain drugs.
	lly important		
pan	eeth be cleaned		Rampant dental decay occurs
en	iring.		often when an individual has
dry			a "dry mouth" because the
th			mouth loses its natural
hin			washing action.
era			Several chemical substances
sal			in saliva inhibit the growth
bac			of bacteria. Others give it
fer			buffering ability to convert
ong			strong acids to weak ones
st			and strong alkalies to weak
s.			ones.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPL
6. Food	Carbohydrates in the mouth are converted into acid by bacteria. Some sugars and starches belong in a balanced diet; however, Americans consume extremely high quantities of these foods. The more frequently that foods with high sugar content are eaten, the more rapidly dental caries are likely to develop The frequent snacking on candies, soft drinks, potato chips, cookies, cakes, etc., is a habit that is especially abused during the teens and contributes to the high decay rate that occurs.	Have students list the number of times they ate <u>any</u> food on the previous day. Point out that the eating of <u>any</u> food, whether one potato chip or a full meal, creates a separate time that food can be left to attack the teeth. Stress that if food was eaten at <u>7</u> different times and the teeth were brushed <u>3</u> times, food was left on the teeth more times than it was removed. Provide a dittoed paper listing the amount of sugar in a variety of commonly eaten foods. Ask the students to estimate the amount of sugar <u>in all</u> of the foods consumed the previous day. The amount can be demonstrated visibly by placing the average amount of sugar consumed in a bottle, glass, or jar.	Not al same a speed. such a very q in raw very s found from su in peo dental Carbohy the gr and hi are as caries Sugar in the steadi per per 115 pou consump 96 poun risen a The Ame with su cookies beverag candies gum, pe cheese, Coffee snackin increas

ERSTANDINGS AND ITAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
es in the mouth ed into acid .	Have students list the number of times they ate any food on the previous day. Point out that the eating of any food, whether one potato chip or a full meal, creates a separate time that food can be left to attack the teeth. Stress that if food was eaten at 7 different times and the teeth were brushed 3 times, food was left on the teeth more times than it was removed.	Not all foods form acid in the same amount or with the same speed. Refined carbohydrates such as table sugar form acid very quickly while the sugar in raw vegetables forms acid very slowly. It has been found that acid formation from sugar is extremely rapid in people with extensive dental decay.
and starches balanced diet; ricans consume igh quantities ods.		
equently that high sugar eaten, the dental caries o develop		Carbohydrate foods stimulate the growth of the lactobacilli and high counts of the bacteria are associated with high caries activity.
snacking on ft drinks, , cookies, is a habit cially abused eens and con- the high decay curs.	Provide a dittoed paper listing the amount of sugar in a variety of commonly eaten foods. Ask the students to estimate the amount of sugar in all of the foods consumed the previous day. The amount can be demonstrated visibly by placing the average amount of sugar consumed in a bottle, glass, or jar.	Sugar consumption per person in the United States has risen steadily from about 18 pounds per person in 1824 to about 115 pounds about 1940. Average consumption in 1950 was about 96 pounds per person and has risen again to over 100 pounds.
		The American diet is filled with sugar-coated cereals, cookies, pastries, sweetened beverages, hard and chewy candies, refined bread, chewing gum, peanut butter and jelly, cheese, mashed potatoes, etc.
		Coffee breaks and frequent snacking are modern habits that increase the number of times

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES
	The discovery of the benefits of fluoride has been a most significant innovation in preventive dentistry. A special category should be provided for fluoridation (drinking water), and fluoridization (typical applications).	
7. Fluoride prevention	Fluoridation: acts on developing unerupted teeth. Most effective (65% reduction) between birth and about 8 years of age. Optional concentration in water: 1 part per million. At this concentration it is perfectly safe, inexpensive, and has no umpleasant taste or odor. Yet many communities resist this benefit to their childrens teeth. Behavioral scientists have several theories,	Arrange with dentist or dental hygiene teacher for a visit to a fluoridation community water supply to observe equipment and control measures.

UNDERSTANDINGS AND DAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPLEMENTARY INFORMATION FOR TEACHERS
		the teeth are subjected to caries attacks. The incidence of caries is usually decreased when refined carbohydrates are eliminated from the diet. A general decrease in decay was noted in European children after World War II following a severe rationing of carbohydrate foods.
scovery of the bene- f fluoride has been significant innova- preventive dentistry. al category should vided for fluoridation ng water), and dization (typical tions).		
dation: acts on bing unerupted teeth. ffective (65% reduc- between birth and 8 years of age. al concentration in 1 part per million. s concentration it fectly safe, inexpen- and has no umpleasant or odor. Yet many ities resist this to their childrens Behavioral scien- have several theories,	Arrange with dentist or dental hygiene teacher for a visit to a fluoridation community water supply to observe equipment and control measures.	It has also be proposed that fluoride be incorporated in bottled drinks, milk and foods, and taken as tablets, although these measures are not as effective as fluoridated drinking water.

REFERENCE	MAJOR UNDERSTANDINGS AND FUNDAMENTAL CONCEPTS	SUGGESTED TEACHING AIDS AND LEARNING ACTIVITIES	SUPPEEMENTARY INFORMATION FOR TEACHERS
	but do not know just why people reject this health innovation.		
	Fluoridization: the benefit from topical fluoride applications is generally less than that from fluoridation. Sodium fluoride (2%) reduces decay 40%. However, some studies using stannous fluoride (8%); and acidulated sodium fluoride phosphate gels are showing remarkable inhibiting powers against decay (80% or greater reductions).	Through diagrams show differences in action between topical fluoride prophylaxis and fluoridation.	Topical agents may be applied in a variety of ways: swabbing solution, rinsing, spray, using gels in fitted mouthpieces, in pumice during cleanings, and in dentifrices.
	Topical fluoride protection is recommended for use in rural communities where it is not practical to provide controlled fluoridation measures.		