Human Tooth

Assembly & Painting Instructions

NO.71341

Your model of the Human Tooth — THE MIGHTY MOLAR is finely detailed for accuracy of study. Before doing any assembly or painting, read these instructions carefully and familiarize yourself with them and the parts. If necessary, trim any excess plastic from the pieces using a sharp knife or emery board to carefully smooth and shape the parts for close and accurate fit. Let all glued and painted parts dry thoroughly before proceeding to the next gluing or painting operation. The numbers referred to in these instructions are marked on each part in the kit.

1) Taking parts 1 and 2, the outside shell of half of the tooth and the inner cross-section piece, fit carefully and glue together. Take part 3, the grinding surface of the tooth, and fitting it in place glue it to parts 1 and 2. Put aside for glue to set firmly.

2) Take parts 4 and 5, the other half of the outer shell of the tooth and the matching inner cross-section piece, fit and glue together. Set aside to dry.

3) Both assemblies above (1 and 2) are painted to match each other. To identify the parts referred to in the following instructions use the illustration showing the structure of the tooth shown on the anatomy chart included with this set. To best demonstrate the different portions of the tooth we suggest painting as follows:

First paint the inner surfaces of the tooth. The PULP in a medium red color, the DENTIN in a flesh or pink color. The ENAMEL layer is a pure white, and if you wish the outer surface of the CROWN of the tooth to be a whiter color than the plastic, also paint the CROWN white when you paint the ENAMEL. Note that on the outer surface only the CROWN of the tooth is painted white. That portion of the tooth is the gum and jaw, shown as the ROOT in the illustration, should be an ivory or cream shade. Let paint dry thoroughly.

4) Take part 6, which is a maze of small nerves and blood vessels, and paint one main cord and its branches red, another cord and its branches blue and another yellow. The red will indicate the arteries, the blue the veins, and the yellow the nerves. Allow to dry thoroughly, then position in the pulp cavity, fitting the pins on one side of the maze to the holes in the cavity, and glue in place.

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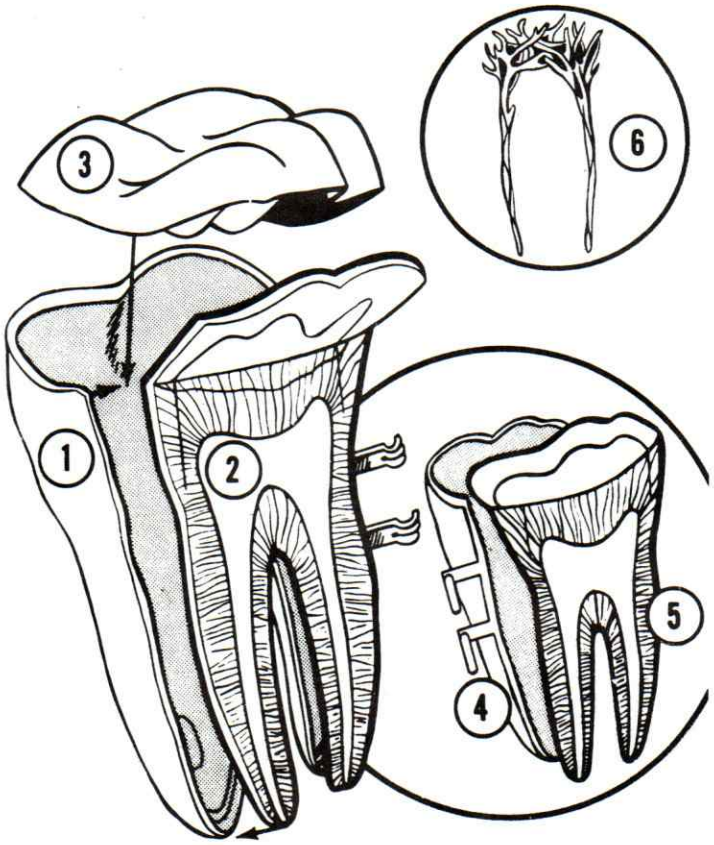
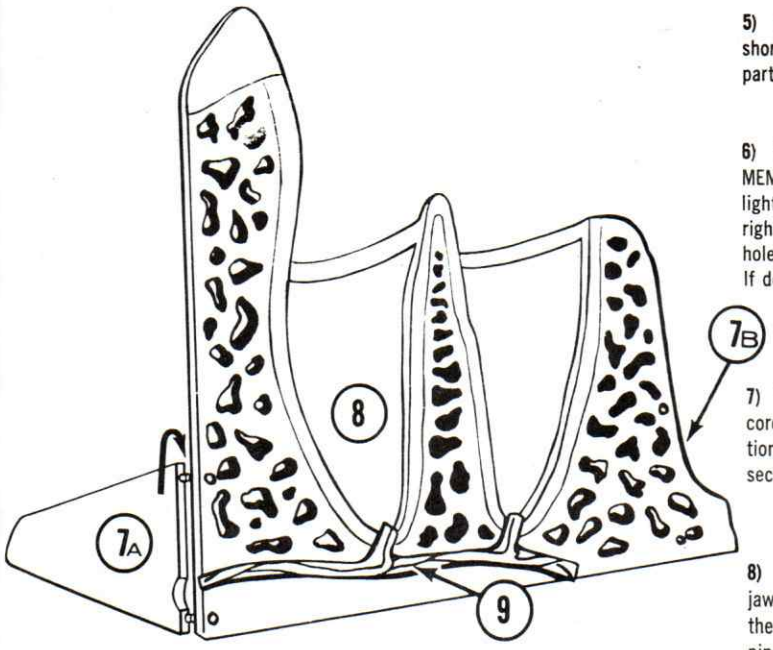




5) Take parts 7A and 7B, the wings of the jawbone stand, and fit the pins on the short side of the wings into the holes provided in the back of the jawbone section, part 8. Glue in place and let dry thoroughly.

6) Take the jawbone assembly from instruction 5, and paint the PERIODONTAL MEMBRANE, as shown in the illustration of the anatomy chart, a deep pink or light red. Also paint the trough in the base of the jawbone, running from left to right, the same deep pink or light red. The bony section of the jaw, having the holes through it, can remain the color of the plastic or can be painted ivory-white. If desired, paint the back of the stand to match the front. Let dry thoroughly.

7) Taking part 9, the nerve and blood vessel complex for the jawbone, paint the cords red, blue, and yellow to match the colors in part 6, as detailed in instruction 4. When paint has dried thoroughly, fit part 9 into the trough in the jawbone section, fitting the pins in the complex into the holes in the trough.

8) Take the assembly of the half tooth from instruction 1 and fit in place in the jaw display stand with the interior of the tooth facing you and the hinge arms on the right. Take the other half of the tooth from instruction 2 and carefully fit the pins on its hinge arms into the hinge section of part 1. The two halves of the tooth will open, or close, for study and display. The entire tooth can also be removed from the stand when desired, and replaced.

Your Teeth and How to Keep Them

Reprinted from **TODAY'S HEALTH,** published by the **AMERICAN MEDICAL ASSOCIATION,** from material prepared by the staff of the **AMERICAN DENTAL ASSOCIATION.**

Acrobats hang by them. Stage villains display them menacingly. You catch a train by the skin of them or, if you're too late, gnash them as it leaves without you.

Students sink them into their studies and then, having passed the course, celebrate by sinking them into a char-broiled steak. "Them," of course, are the teeth.

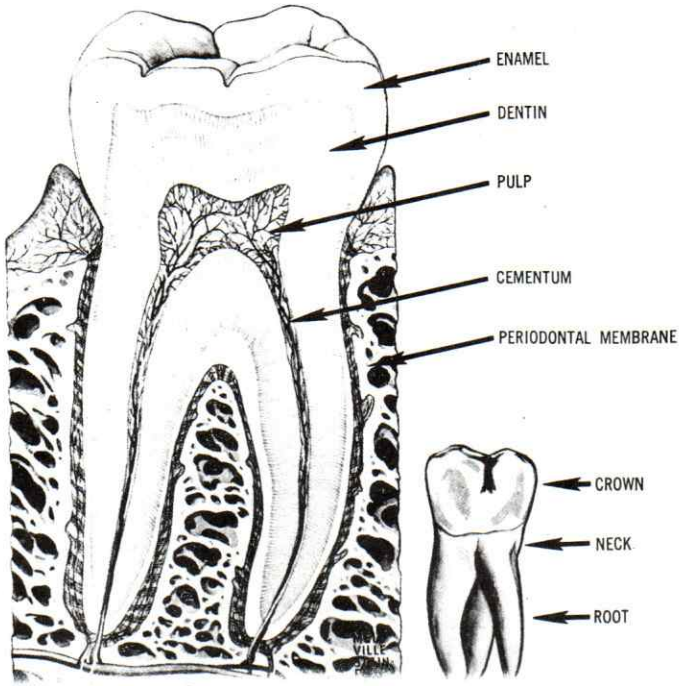
An integral part of the wonderful human machine, teeth display disconcerting characteristics. They are one of the most durable of organs after death, sometimes being discovered in centuries-old skeletons. And yet, during life, they seem to decay faster than any other organ. And beyond that, the more advanced civilization, the more prevalent decay seems to be. Perhaps, then, the fact that 95 percent of all Americans suffer decay at one time or another is merely a proof of how "advanced" we are.

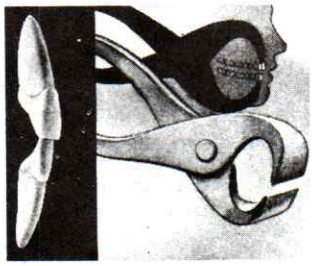
The precise language of a textbook would tell us that teeth are hard, calcified structures set firmly in bony sockets in the upper and lower jaws. A tooth, it would go on, is divided into two main parts: a root or roots which anchor it in the jawbone; and a crown, the part that is visible in the mouth. At the gum line, between the root and crown, is a slightly narrowed part called the neck.

Four tissues comprise the tooth: the enamel, the cementum, the dentin, and the dental pulp. The enamel is the shiny surface that covers the crown, the visible part of the tooth. It is the first line of defense against decay. The cementum is a bone-like substance covering the root; the dentin is an ivory-like substance that forms the body of the tooth, and the dental pulp occupies a hollow space, the pulp chamber, in the interior of the tooth.

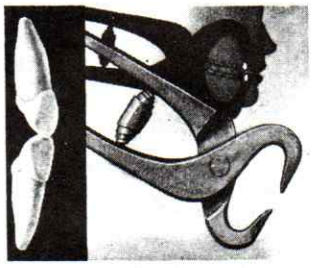
ANATOMY CHART

THE STRUCTURE OF THE TEETH

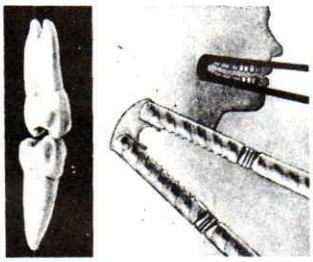




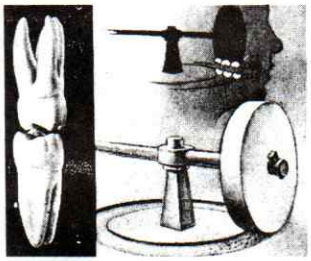
The incisors cut or incise our food.



The cuspids are used for tearing food.



The bicuspids tear and crush food.



The molars are used for grinding food.

The dental pulp contains nerves and blood vessels that enter the teeth through an opening at the end of the root. Covering the root of the tooth and lining the wall of the socket in the bone is a delicate (1 mm.) cushion of tissue called the peridontal membrane; it helps hold the tooth in place and lessens shock as the teeth come together in chewing.

The most important function of teeth is chewing food, the initial step in digestion and nutrition. Further, normal speech is impossible without teeth. And finally, the appearance of the face is dependent in large part on well-formed jaws and teeth in proper position.

There are four types of teeth, each serving a different function in the chewing process.

The incisors, both central and lateral, have a sharp, flattened edge. They are in the center of the mouth and, as the name indicates, are used to cut or incise the food. In a permanent set of 32 teeth, there are four central incisors and four lateral ones.

The cuspids, or canines, located at the corners of the mouth, are spade-shaped. They are used to tear or shred food, and they number four in a permanent set. A slang term for cuspids is "eyeteeth," since it was once believed that the root went all the way to the eye. The root is quite lengthy and heavy, but not to that degree.

The bicuspids or pre-molars, eight in number, are shaped roughly like two fused cones and are used to tear and grind food.

At the very back of the mouth, on either side, are the 12 molars, which look like four or five fused cones. They function as crushers and grinders of food

In investigating decay, researchers have been able to eliminate some possible causes. We know, for example, that decay isn't an allergy, an inflammation, a cancer, or atrophy. Neither is it contagious.

On the more positive side, the factors leading to decay have received close attention. Principal among them are these four:

1. The presence of dental plaques, which are the gelatin-like adherent films that form on the teeth and afford protection for the bacteria which produce the acids that eat into the enamel.

2. The strength of the acid and the power of the saliva to neutralize it. Saliva, we do know, is essential to the health of teeth. When the salivary glands are destroyed or removed, tooth decay becomes rampant.

3. The length of time the acid is in contact with the teeth. When a dentist urges you to brush immediately after a meal or snack, "immediately" is the key word. An hour later, even one-half hour later, will do relatively little. A vigorous rinsing of the mouth with water will be of some benefit to the millions who find it inconvenient or impossible to brush after every meal.

4. Susceptibility of teeth to decay. Heredity does seem to be a factor in dental health.

Researchers have further discovered that without bacteria, and without a food supply passing through the mouth, there is no decay. Animal experiments, both through the use of germ-free environments and by feeding with tubes directly into the stomach, have yielded conclusive experimental evidence on these points. A further experiment, involving a pair of rats joined by surgery so as to share a common blood stream, gave even more dramatic proof. The rat who was fed by mouth developed decay, the rat fed by tube did not.

The joker in this dental deck, of course, is that it would be highly impractical to live our lives in germ-free laboratories and quite dull, gastronomically speaking, to be fed through tubes. After all, how could they get a turkey leg or apple pie through a tube? At any rate, it is virtually impossible to expect our mouths ever to be completely clean or free from bacteria.

This doesn't mean tooth brushing should be abandoned as being in vain. On the contrary, it is simply, the scientists point out, impossible for it or any single procedure or treatment to be a complete guarantee against decay.

Resistance to decay on the part of the enamel itself has played an important part in research. Experiments have shown that the quality of the diet is of prime importance during the pre-natal and early infant phase of tooth development. What the experiments did, essentially, was to put one female animal on a decay-producing diet while feeding another female animal a normal control ration. Both animals stayed on their respective diets during the period covering conception, pregnancy, and nursing. The offspring of both were then put on a decay-producing diet. More decay was found in those animals whose mother had eaten the decay-producing diet.

In the long run, some scientists believe, the secret of dental health will be found within the teeth themselves rather than in the environment. As a matter of fact one discovery of extraordinary significance has already been made in this area.

In analyzing the chemical composition of enamel, a number of trace elements were found. One of them was fluorine. Investigation showed that fluorine entered into a chemical reaction at the surfaces of the enamel and formed a relatively insoluble product making the teeth more resistant to decay.

Intensive and extensive research into the action of various forms of fluorine (fluorides) on the teeth began. It was discovered that if too little fluoride was consumed, no beneficial result was obtained. If there was too much, teeth were healthy, but the enamel tended to mottle. The ideal level was found to be one part fluoride per one million parts water.

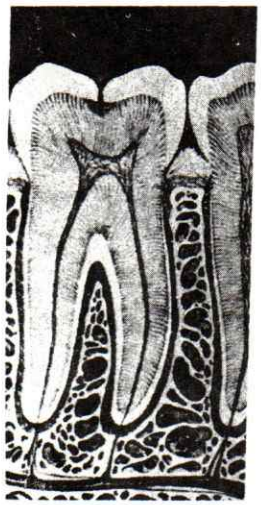
Studies extending over a decade and more showed there were no untoward effects at this level and decay was reduced by as much as 65 percent. Once the facts were known with certainty, responsible health agencies, private and governmental, began to strongly recommend fluoridation of community water supplies as safe, effective, and economical (costing, in some areas, less than 10 cents per person per year). Dental researchers consider it one of the most important discoveries in decay resistance yet made.

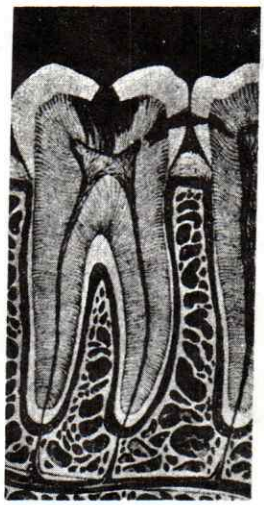
Of course, such dramatic breakthroughs are not daily occurrences in any scientific field. Still, continuing intensive research should eventually lay bare all the secrets of that hard, calcified structure that is so essential to acrobats, villains, bus-catchers, students and, in fact, the entire human family.

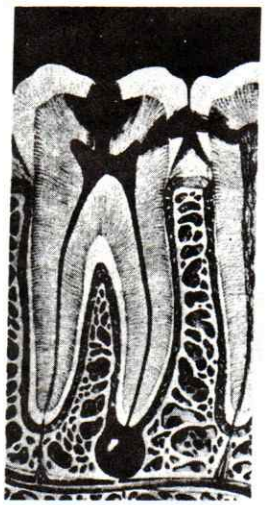
END

Progress of decay. At left, the early stage—enamel has been penetrated. Next, the softer dentin is attacked.

Then, the pulp is killed and an abscess formed. Finally, molar is extracted and adjoining bicuspid is abscessed.







LINDBERG HOBBIES, An RPM Company CRAFT HOUSE CORPORATION, Toledo, Ohio 43607 PRINTED IN U.S.A.

s you move from the teeth in the front of the mouth to those in the back, you o from a slicing to a shearing to a crushing action. While there can be no sharp nd exclusive distinction made between the tasks of the four types of teeth, different kinds of foods do call them into play in varying degrees of importance.

r example, biting into an apple or soda cracker, we use the incisors to shear f or chop a portion. Nibbling canapes at a reception would also utilize the cisors.

ting celery involves initially the cuspids and bicuspids. Celery is no tougher an an apple, but it is fibrous and stringy. Consequently, the most efficient ethod of eating it is to slice the fibers with the cuspids and bicuspids (giving se to the gratifyng "crunch" that is associated with eating celery) while the nd twists off the rest of the stalk.

lolars are most useful in completing the chewing process started by the other eeth.

he molars have practically no cutting or incising power, but their surface is road and considerable pressure can be applied with them. The molars clamp the ood, a piece of steak for example, the way a vise clamps a piece of wood. It hen crushes and grinds the steak until it is reduced to a pulp-like condition suitble for swallowing.

Good things come in pairs, and teeth are no exception. The first set of deciduous r baby teeth, begin forming during the first month of prenatal life. While the uture jaws, tooth sockets, and dentin are being formed by connective tissue, nits of the enamel are being made by epithelial cells, the same family of cells hat gives rise to hair and nails.

The permanent teeth begin to appear at about age six with the eruption of two molars. The process continues until the person is about 12, when he has 28 permanent teeth. Then, about age 18, the third permanent molars, the wisdom teeth, usually arrive. Sometimes they never do appear. But whether the permanent set is 28 or 32, it's all the person will normally have.

Because the permanent teeth must serve us from age six until the end of our life, some people have the idea that only they are important and the deciduous or baby teeth are not. It isn't true and, in fact, this erroneous belief contributes much to the sorry state of the teeth of the American population.

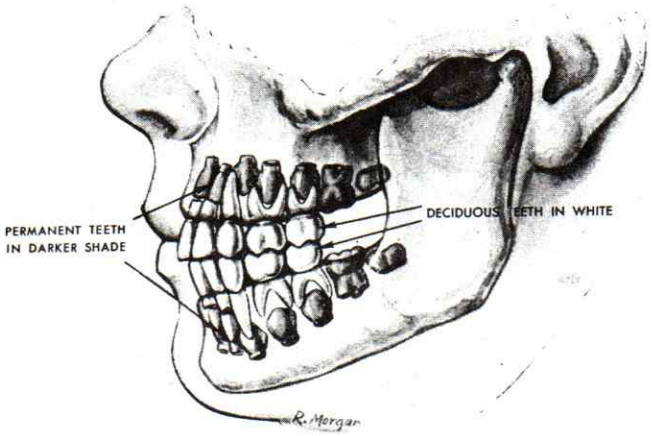
Aside from the obvious advantages of early inculcation of sound oral hygiene practices, neglect and loss of the baby teeth before they are naturally shed can led to "drifting" of the remaining teeth. This, in turn, can hamper, and even prevent, the eruption of the permanent teeth in proper position.

The result is crooked permanent teeth, not only unattractive, but subject to unnatural stress and strain since the pressures involved in chewing are not properly distributed. Such stress, continued over a lengthy period of time, will lead to loss of teeth.

Losing a tooth from such causes is needless. So in fact is almost all loss of teeth. The knowledge that has been gained by dental researchers in the past half century, together with sound home practices and regular professional care, enables the average person to retain a full set of teeth throughout life.

Much of the research that has yielded these striking advances has been on the basic causes for dental decay and on the composition of enamel, the protective armor of the tooth. Modern techniques and research instruments have shown that the process of decay is very complex. It is, in fact, so complex that we haven't isolated all the elements that would allow dental science to formulate a thorough explanation.

JAW OF CHILD A LITTLE OVER 6 YEARS OLD



A landmark in modern tooth research occurred near the turn of the century when it was discovered that the enamel is not dead but is partly organic. This fundamental discovery forms the basis for much of the research being carried out today.

As mentioned above, the epithelial cells are responsible for formation of the enamel, beginning about the first month of fetal life. Each enamel-forming cell, called an ameloblast, builds a tiny, pencil-shaped prism. These prisms are packed together lengthwise like firewood cords. The ends of the prisms become the surface of the enamel. It takes some 10 million prisms to make the enamel crown of a molar tooth.

Under the microscope, the prisms show growth lines resembling the rings of tree trunks. During the growth period, they are extremely sensitive to any disturbances in metabolism, so that an infection or nutritional deficiency can interrupt development and leave a permanent imprint.

Throughout the 19-year span of enamel-forming, from fetal life until age 18 when the permanent molars erupt, the cells need to stay healthy; this is because ameloblasts, unlike many other body cells, cannot reproduce or heal themselves.

Research has shown that teeth exchange minerals with the rest of the body. Phosphate ions, for example, penetrate through the enamel in both directions—from saliva to the internal pulp of the tooth and vice versa. It is this sort of discovery that has shown the cause of decay to be enormously complicated and, as yet, unfathomed.

Another factor in decay is that the tooth itself, like the ameloblasts, is not self-healing. Once decay has begun, its progress is inexorable and irreversible. When the dentist fills a cavity, he is removing that part of the tooth which decay has attacked and substituting an artificial material. He cannot restore the decayed part of the tooth with new tooth substance. Because of this fact, we could accurately characterize the United States as a nation of "dental cripples."

Studies show that half of all the two-year-old children in this country have one or more decayed teeth. By the time they reach school age, they have three or more decayed teeth. At age 16, the average youth has seven decayed, missing or filled teeth. More than nine out of 10 high school students have dental decay. At a given moment, there are an estimated one billion unfilled cavities in American mouths.