

# Dental Anatomy and Terminology

Ruth Ashley and Tess Kirby

For Self-Study or Classroom Use



SELF-  
TEACHING  
GUIDES



---

---

# DENTAL ANATOMY AND TERMINOLOGY

---

---

**RUTH ASHLEY**

*Instructional Technologist  
The Athena Corporation  
Bethesda, Maryland*

**TESS KIRBY**

*Program Associate  
School of Dentistry  
University of Michigan  
Ann Arbor, Michigan*

in consultation with

**HARRY R. PAPE, Jr., D.D.S.**

*Assistant Professor of Operative Dentistry  
School of Dentistry  
University of Michigan  
Ann Arbor, Michigan*

**John Wiley & Sons, Inc.**  
**New York • London • Sydney • Toronto**

---

---

Editors: Judy Wilson and Irene Brownstone  
Production Manager: Ken Burke  
Editorial Supervisor: Tom Wolf  
Composition and Make-up: Ikuko Workman  
Artist: Jim Schulz  
Photos: Karna Steelquist and John Viery

Copyright © 1977, by John Wiley & Sons, Inc.

All rights reserved. Published simultaneously in Canada.

No part of this book may be reproduced by any means, nor transmitted, nor translated into a machine language without the written permission of the publisher.

Library of Congress Cataloging in Publication Data

Ashley, Ruth

Dental anatomy and terminology.

(Wiley self-teaching guides)

1. Dentistry—Terminology—Programmed instruction.
2. Teeth—Programmed instruction. I. Kirby, Tess, 1943- joint author. II. Title. [DNLM: 1. Tooth—Anatomy and histology. 2. Dentistry—Terminology. WU101 A826d]

RK28.A83

617'.001'4

76-49088

ISBN 0-471-01348-X

Printed in the United States of America

77 78 10 9 8 7 6 5 4 3 2 1

---



---

---

# To the Reader

---

---

The specialized world of dentistry has a language all its own, spoken and comprehended by a specialized segment of the population. This Self-Teaching Guide is designed for people who will join the field as students or workers among the professionals and paraprofessionals who make up the dental world. Dental Anatomy and Terminology provides a broad base of knowledge of various aspects of teeth and the scope of dentistry. You will learn to recognize and use the technical terms for common features and codes for referring to specific parts of specific teeth. You will learn what conditions are treated by various specialists. You will survey some common dental procedures, identifying many of the materials and instruments used. You will not, of course, learn all about the subject. But you will have a basis for learning more, either on your own or through organized classes, or through on-the-job experiences.

More specifically, Chapter One begins with the dental structures you are most familiar with—the ones you can see, with the aid of a mirror, in your own mouth. You will begin learning technical language for common terms. In Chapter Two we look at the two arches of teeth. We discuss names of teeth and types of surfaces before beginning to investigate how teeth relate to each other. Then in Chapter Three we discuss the specifics of dental anatomy: the distinctions and similarities among individual teeth. Chapter Four presents the three most common numbering systems for teeth. In Chapter Five we examine the microscopic structure of teeth and the structures that support them in their sockets. Chapter Six contains a discussion of the major bones and muscles that concern workers in the dental field. The network of nerves to the teeth is also presented in this chapter since these terms often become confused with names of bones and muscles. By the time you complete Chapter Six, you should have a good grasp of the anatomy and function of the teeth and oral cavity.

Dental terminology that is common to many areas of dentistry is covered in Chapter Seven. Here you learn about a dental office, X-rays, anesthesia, and isolation techniques. The remaining chapters (Eight through Twelve) deal with the more specialized terminology peculiar to the different areas. While learning the vocabulary, you will also become familiar with many of the techniques, instruments, and procedures used in dentistry.

Appendix I provides information about some of the major career areas

---

---

in dentistry. Your State Dental Association or local college will be able to give you more information on opportunities in your area.

Appendix II provides a Glossary that will prove especially useful to those who will be using their newly acquired terminology. Spelling, pronunciation, and definitions of most of the terms presented in the text (and some additional terms as well) are included. The separate Index refers you to the appropriate page in the text, if further information is desired.

This Guide can also be useful and informative to those who wish to communicate more effectively with their dental practitioner. A better understanding of the structure and functioning of teeth encourages better care of the teeth and tissues of the mouth.

The faculty, staff, and students of the School of Dentistry of the University of Michigan have contributed enormously to making this Self-Teaching Guide possible. Without them and their patience and help over the years, we would not have even considered writing it. Special appreciation is due to a few for their more direct efforts. Dr. Harry Pape provided invaluable aid in every stage of the development of the book. Dr. Joseph Chasteen provided advice, support, and an occasional definition. To them and to all the rest, we offer thanks.

Ruth Ashley

Tess Kirby

---

---

# How to Use This Book

---

---

The first six chapters of this Self-Teaching Guide are concerned with dental anatomy—the structure of the teeth and surrounding tissues. The last six chapters explore the various specialty areas of dentistry, along with the terminology applicable to each area.

Each chapter begins with a list of objectives, which summarize what you will learn as you study the chapter. These objectives define what you should be able to do after you have completed the chapter. A Self-Test at the end of each chapter enables you to find out if you have indeed learned the material.

Between the objectives and the Self-Test, each chapter is divided into many smaller segments called frames. Each frame presents some new information or integrates old information. Several questions follow the information portion of each frame. Correct answers to these questions follow the dashed line after the questions. As you work through this Self-Teaching Guide, use an index card or folded piece of paper to mask the printed answers until after you have written down your own. After you have answered the questions in a frame, compare your answers to the printed ones below the dashed line. You need not have used the exact words given in the answers, but be sure you understand any discrepancies before going on to the next frame.

Each chapter will take from one to three hours to complete. Try to complete each one in no more than two study sessions. You will learn the material more easily if your work is not interrupted frequently. Immediately after completing the last frame in a chapter, take the Self-Test for that chapter. Compare your answers to those given in the answer key following the Self-Test. The frame numbers given with each answer refers you to the point in the chapter where the subject was discussed. Use these to review any items you miss. If you miss more than half the items in any Self-Test, you will find it useful to review the entire chapter before continuing on to the next. At the end of Chapter Twelve, following the Self-Test for that chapter, is a final test for Dental Anatomy and Terminology. You may wish to review the objectives for each chapter before taking this test. Check your answers with the answer key to determine how well you have retained the information you have learned. As before, frame and chapter references are given with the answers for your review.

---

## PREREQUISITES

You should be able to master the material in this Self-Teaching Guide without any specific background in the field of dentistry. A high school education will have provided you with an adequate lay vocabulary to learn the basics of Dental Anatomy and Terminology through independent study.



---

---

# Contents

---

---

To the Reader	v
How to Use This Book	vii
Chapter One THE ORAL CAVITY	1
Chapter Two TEETH AND THEIR SURFACES	23
Chapter Three ANATOMY OF A TOOTH	40
Chapter Four TOOTH NUMBERING SYSTEMS	59
Chapter Five INTERNAL STRUCTURE OF TEETH	82
Chapter Six BONES, MUSCLES, AND NERVES OF THE ORAL CAVITY	96
Chapter Seven THE DENTAL OPERATORY	108
Chapter Eight RESTORATIVE DENTISTRY	130
Chapter Nine CAST RESTORATIONS AND PROSTHODONTICS	147
Chapter Ten ORAL SURGERY	164
Chapter Eleven PERIODONTICS	180
Chapter Twelve OCCLUSION AND ORTHODONTICS	191
Final Test	199
Appendix I CAREERS IN DENTISTRY	209
Appendix II GLOSSARY	211
Index	232



---

---

# CHAPTER ONE

## The Oral Cavity

---

---

In this chapter you will learn the essential terminology and structures of the mouth. First, we will consider the structures visible when the mouth is closed. Then we will move slowly inside, considering the structures which are basic to your further study of dental anatomy and terminology.

When you complete your study of this chapter, you will be able to:

- Use the following locational terms:

anterior	superior	medial
posterior	inferior	lateral

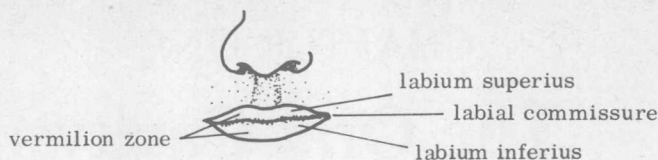
- Define and/or locate the following oral structures:

labium superius	gingival sulcus
labium inferius	interdental papilla
vermilion zone (and border)	mucogingival junction
labial commissure	alveolar mucosa
tubercle	palate
philtrum	hard palate
labiomental groove	soft palate
labiomarginal groove	uvula
nasolabial groove	palatine raphe
oral cavity proper	incisive papilla
oral vestibule	rugae (ruga)
maxillary arch	oropharyngeal isthmus
mandibular arch	palatopharyngeal arch
central frenum	palatoglossal arch
lateral frenum (frena)	lingual surface
buccal surface	lingual frenum
labial surface	sublingual sulcus
Stensen's duct	salivary caruncle
gingiva	sublingual fold
attached gingiva	palatine tonsils
free gingiva	pterygomandibular fold
free gingival groove	vestibular fornix

1. The parts of the face that form the passageway to the mouth are labeled in the drawing on the following page. Their technical names may not be familiar to you. Write the name of each next to the common names in the following list.

## 2 DENTAL ANATOMY AND TERMINOLOGY

---



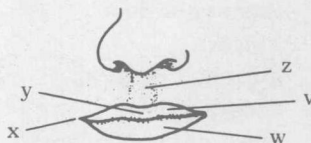
- a. \_\_\_\_\_ upper lip  
b. \_\_\_\_\_ lower lip  
c. \_\_\_\_\_ red area of the lips  
d. \_\_\_\_\_ junctions of the upper and lower lips  
at corners of mouth

- 
- a. labium superius  
b. labium inferius  
c. vermilion zone  
d. labial commissure

2. The Latin term labium means lip; labia refers to both lips. As you noticed in the preceding frame, the term superius means upper and inferius means lower. The two labia, labium inferius and labium superius, are joined at the sides at the labial commissure, or lip junction. The entire red area of the lips is called the vermilion zone (vermilion is a shade of red). The very edge of the vermilion zone, where it is next to the skin of the face, is called the vermilion border. In the center of the vermilion zone of labium superius is a slightly raised area called the tubercle of the lip. Directly above the tubercle, or superior to it, is a groove that connects the upper lip to the midline of the nose. This groove is called the philtrum.

- a. Give the letter that indicates the location of each of the following terms:

- \_\_\_\_\_ labial commissure  
\_\_\_\_\_ labium superius  
\_\_\_\_\_ tubercle  
\_\_\_\_\_ philtrum  
\_\_\_\_\_ labium inferius



b. What term describes the edge of the red area of the lips? \_\_\_\_\_

c. What word would be used to refer to the two lips? \_\_\_\_\_

-----

- a. x, v, y, z, w
- b. vermillion border
- c. labia

3. Match the following items by writing the number of the descriptive phrase next to each technical term.

- |                            |   |
|----------------------------|---|
| a. _____ labium superius   | 1. central raised area on labium inferius               |
| b. _____ labium inferius   | 2. central raised area on labium superius               |
| c. _____ labial commissure | 3. upper lip  |
| d. _____ tubercle of lip   | 4. junction of lips                                     |
| e. _____ philtrum          | 5. lower lip  |
|                            | 6. groove that extends from tubercle to midline of nose |

-----

a. 3; b. 5; c. 4; d. 2; e. 6

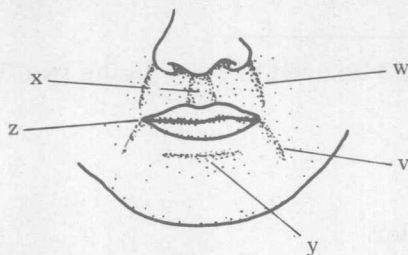
4. Three other major grooves near the lips complete the exterior features of the mouth. Try to identify these on your own face, either with a mirror or by touch, as you read these descriptions.

The labiomental groove is a horizontal depression that separates the lower lip from the chin. (The suffix -mental is Latin for chin.) The labiomarginal grooves (two of them) separate the lower lip from the cheek. The grooves extend from the labial commissure downward toward the sides of the chin. The nasolabial grooves are depressions that separate the upper lip from the cheeks. These extend from the corners of the nose downward to the labial commissure. (The prefix naso- refers to the nose.)

Now write in the names of the features labeled on the drawing on the following page.

#### 4 DENTAL ANATOMY AND TERMINOLOGY

---



v \_\_\_\_\_

w \_\_\_\_\_

x \_\_\_\_\_

y \_\_\_\_\_

z \_\_\_\_\_

-----

v: labiomarginal groove

w: nasolabial groove

x: philtrum

y: labiomenal groove

z: labial commissure

5. a. Which groove is closest to the tubercle of labium superius? \_\_\_\_\_

\_\_\_\_\_

b. Which groove separates labium inferius from the chin? \_\_\_\_\_

\_\_\_\_\_

c. Which groove separates the labia from the cheeks? \_\_\_\_\_

\_\_\_\_\_

d. What term describes the colored area of the lips? \_\_\_\_\_

\_\_\_\_\_

-----

a. philtrum

b. labiomenal

c. labiomarginal and nasolabial

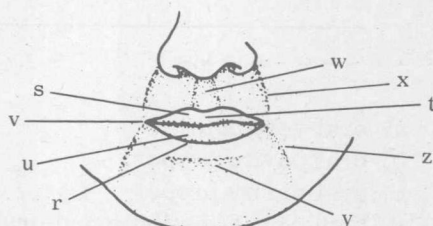
d. vermilion zone

---



6. Label the drawing below, writing the name of the structure indicated by the letters.

r \_\_\_\_\_  
 s \_\_\_\_\_  
 t \_\_\_\_\_  
 u \_\_\_\_\_  
 v \_\_\_\_\_  
 w \_\_\_\_\_  
 x \_\_\_\_\_  
 y \_\_\_\_\_  
 z \_\_\_\_\_



-----

r: vermilion border (or edge of vermilion zone)  
 s: labium superius  
 t: tubercle  
 u: labium inferius  
 v: labial commissure  
 w: philtrum  
 x: nasolabial groove  
 y: labiomental groove  
 z: labiomarginal groove

7. The Latin term for mouth is os; the adjective we use to refer to the mouth is oral. Thus, the area inside the mouth is called the oral cavity. The part of the mouth between the outer surfaces of the teeth and the inner surface of the lips and cheeks is called the oral vestibule; it is the entranceway to the oral cavity proper. The oral cavity proper is bounded by the palate superiorly (on the top), the floor of the mouth inferiorly (on the bottom), the teeth anteriorly (in the front) and laterally (on the sides), and the throat posteriorly (in the back).
- a. Just inside your upper lip, where it joins the gum in the midline, is a fold of tissue called the central frenum. Is the central frenum a part of the oral vestibule or the oral cavity proper? \_\_\_\_\_
- b. Is the tongue found in the oral vestibule or in the oral cavity proper? \_\_\_\_\_

c. Which portion of the oral cavity is found directly beneath the palate? \_\_\_\_\_

d. Which portion of the oral cavity is bounded by the teeth? \_\_\_\_\_

-----

- a. oral vestibule
- b. oral cavity proper
- c. oral cavity proper
- d. both--oral vestibule and oral cavity proper

8. The two arches of teeth which divide the oral vestibule from the oral cavity proper are named for the bones in which they are located. The mandible is the bone that forms the lower jaw; thus, the lower arch is called the mandibular arch. The upper jaw is the lower part of two bones called the maxillae (singular, maxilla); thus, the maxillary arch contains the upper teeth. Since both arches contain teeth, they are often called the dental arches (dent- is a prefix meaning teeth). Several structures located in the oral vestibule serve to join the lips to the dental arches. Small folds of membrane called frena (singular, frenum) connect the lip to the gum tissue near the teeth. The term frenulum is sometimes used instead of frenum. You can feel both the mandibular and maxillary central frena with your tongue. On each side you also have a lateral frenum in each arch. These four lateral frena are a little harder to feel with your tongue, but are readily apparent when the cheek is stretched. The tissue that lines the oral vestibule, and, in fact, most of the oral cavity, is mucous membrane which secretes a substance that lubricates the area and keeps it moist.

a. What is the name of the small fold of mucous membrane in the center of the inside of labium inferius? \_\_\_\_\_

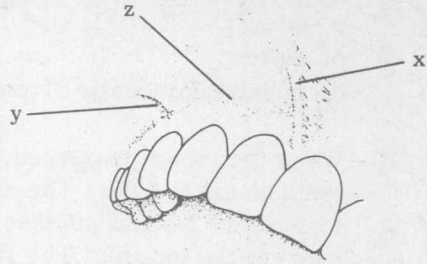
b. Is the right lateral maxillary frenum located in the oral cavity proper or in the oral vestibule? \_\_\_\_\_

c. What two structures divide the oral cavity proper from the oral vestibule? \_\_\_\_\_

d. In the drawing of the right portion of the maxillary arch and adjoining structures, label the indicated features.

---

x \_\_\_\_\_  
 y \_\_\_\_\_  
 z \_\_\_\_\_



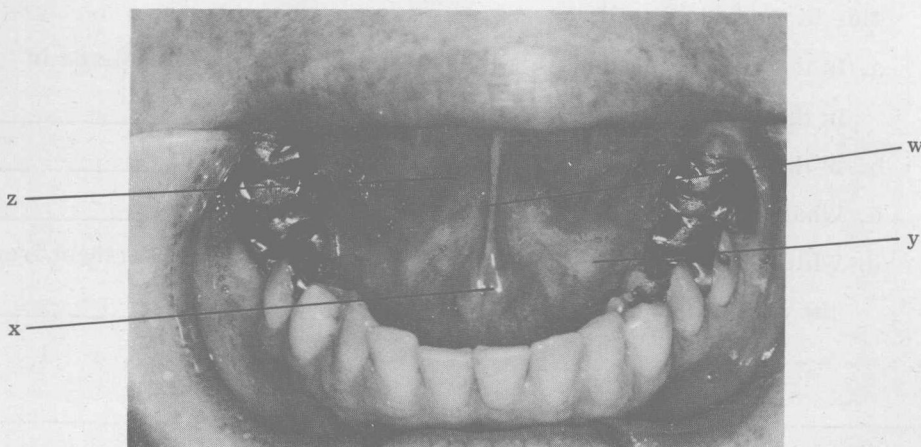
- 
- a. mandibular central frenum
  - b. oral vestibule
  - c. maxillary dental arch and mandibular dental arch
  - d. x: maxillary central frenum  
     y: left lateral maxillary frenum  
     z: mucous membrane

9. One surface of each tooth is called its facial surface; this may be next to either the cheek wall or the lip, depending on the tooth. The facial surface always faces the oral vestibule. The term buccal refers to the cheek; the surface of teeth closer to the cheek wall is called the buccal surface. Similarly, the surface of teeth nearer the lips is called the labial surface. The lateral frena are considered buccal structures since they connect the cheek to the structures closer to the teeth. Another structure found in the buccal wall is the parotid papilla, a small protrusion or bump, that occurs at the opening of a duct or tube leading from the parotid gland. The parotid gland is a large salivary gland that produces saliva. The saliva is conveyed to the oral cavity in a duct called Stensen's duct, which terminates at the parotid papilla just below the maxillary lateral frenum on each side in the buccal wall.

- a. Is the opening of Stensen's duct found in the oral vestibule or in the oral cavity proper? \_\_\_\_\_
  - b. Is the parotid papilla a labial or buccal structure? \_\_\_\_\_
  - c. What substance would be found in Stensen's duct? \_\_\_\_\_
  - d. Which of the six frena would you expect to be located farthest from the outlet of Stensen's duct? \_\_\_\_\_
-

- a. oral vestibule
  - b. buccal
  - c. saliva
  - d. mandibular central frenum
10. When the mouth is opened, the most obvious structure behind the teeth is the tongue. The adjective lingual is used to refer to the tongue; the lingual surface of a tooth refers to the surface of a tooth nearest the tongue. The lingual frenum is a fold of tissue that connects the underside of the tongue to the floor of the mouth. The upper surface of the tongue is called the dorsal surface. It contains several kinds of papillae (singular, papilla), or little elevations, within which are taste buds and other small structures. The dorsal surface is also called the palatine surface, since the front part of the tongue is directly beneath the palate. The ventral surface of the tongue is its underside, near the floor of the mouth. When you raise your tongue, the lingual frenum stretches, forming a horse-shoe-shaped space on the floor of the mouth. This space is called the sublingual sulcus (sub means under; sulcus means groove). In the center of the sublingual sulcus is a raised mass of tissue that leads into the lingual frenum. This tissue is called the salivary caruncle, or sublingual caruncle. A caruncle is a fleshy protuberance; the sublingual caruncle is continued on either side by a raised fold of tissue called the sublingual fold. Saliva from several minor sublingual salivary glands enters the oral cavity through ducts that connect with this fold. For this reason, both the sublingual caruncle and fold are sometimes called the salivary caruncle and salivary fold.
- a. Label the indicated structures on the floor of the mouth.

W \_\_\_\_\_ Y \_\_\_\_\_  
X \_\_\_\_\_ Z \_\_\_\_\_





b. Which surface of the tongue is shown in part a? \_\_\_\_\_

\_\_\_\_\_

c. Name the dental arch shown in the picture on the previous page.

\_\_\_\_\_

d. Name two structures through which saliva enters the oral cavity.

\_\_\_\_\_

-----

a. w: lingual frenum

x: sublingual (salivary) caruncle

y: sublingual (salivary) fold

z: sublingual sulcus

b. ventral (or undersurface)

c. mandibular arch

d. parotid papilla, or Stensen's duct, and sublingual fold

11. Describe briefly where each of the following structures is located.

a. oral vestibule \_\_\_\_\_

\_\_\_\_\_

b. mandibular central frenum \_\_\_\_\_

\_\_\_\_\_

c. lingual frenum \_\_\_\_\_

\_\_\_\_\_

d. Stensen's duct \_\_\_\_\_

\_\_\_\_\_

e. sublingual sulcus \_\_\_\_\_

\_\_\_\_\_

f. dorsal surface of the tongue \_\_\_\_\_

\_\_\_\_\_

g. buccal surface of a tooth \_\_\_\_\_

\_\_\_\_\_

-----