

DENTAL ANATOMY

Part (1)

LEC. 1

Performed by:

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Introduction

- **Dental Anatomy:** is that branch of gross anatomy dealing with the position, relation, structure, form and function of the teeth and surrounding tissues.
- **Rationale for studying Dental Nomenclature**
- i. To establish common language for communicating with colleagues.
- ii. As a building block for studying dentistry
- **Reference Book:** (Wheeler's Dental Anatomy, Physiology, and Occlusion , Ash Nelson, Eighth Edition, Saunders, 2003.)

Nomenclature

- Dense=tooth
- Dental=anything related to tooth
- Man is a **heterodont**, which means that he has different-shaped teeth.
- Man is a **diphyodont**, which means that he has two sets of teeth; deciduous teeth (primary teeth) and permanent teeth.

Types of Teeth

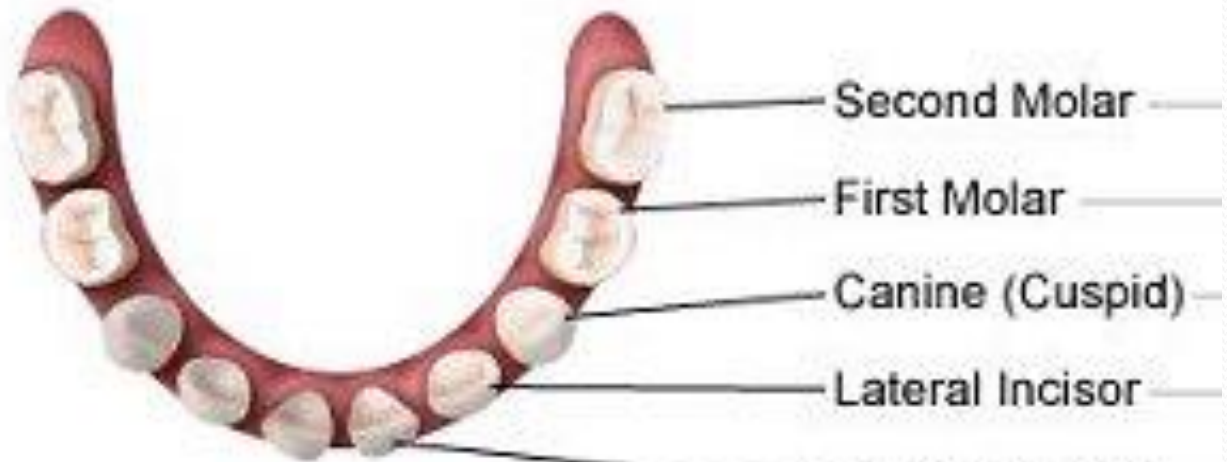
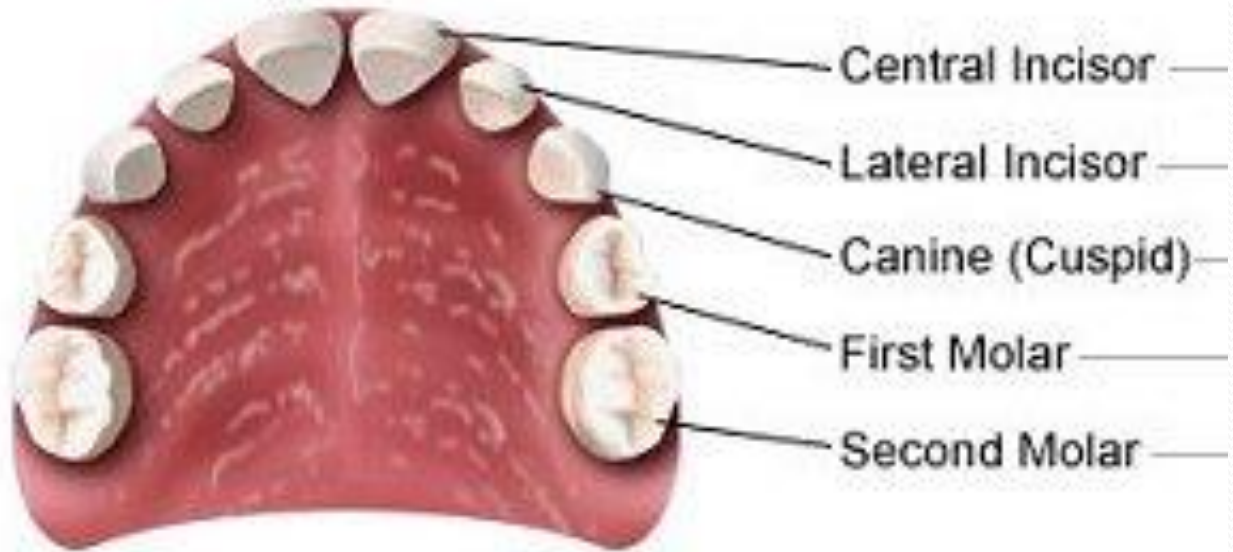
- i. **Incisors:** designed to incise or cut
- ii. **Canines:** designed to grasp or hold food
- iii. **Premolars:** designed to hold and crush food
- iv. **Molars:** designed to grind and mix food

The deciduous teeth

- At birth, there are no teeth present in the mouth, but many teeth in various stages of development are found in the jaws.
- After birth, (post-natal period), the eruption of deciduous teeth start at six months and lasts until two and a half years.
- The deciduous teeth stay until the permanent teeth erupt at about six years of age, when the transition of the permanent dentitions begins.

Baby Teeth

Upper Teeth

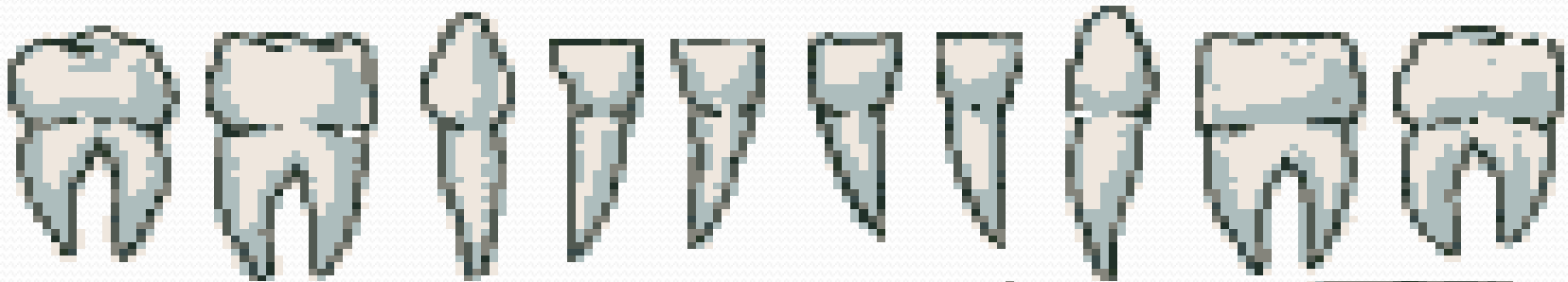
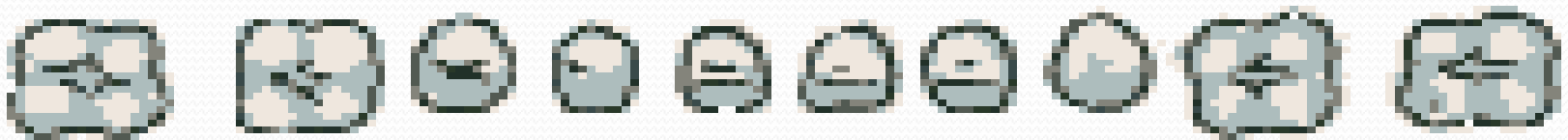
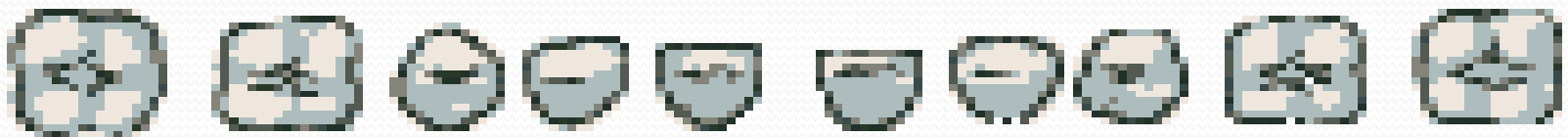
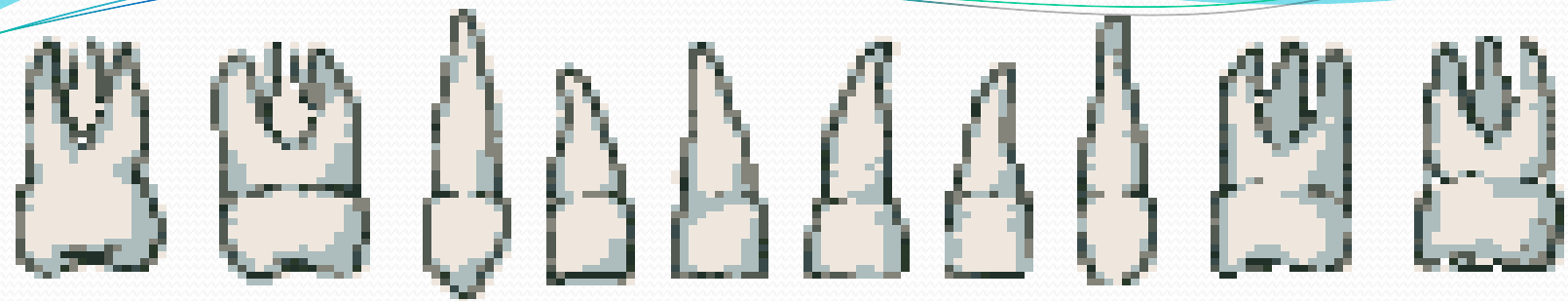


Lower Teeth

TOOTH MORPHOLOGY OF PRIMARY TEETH

The primary teeth are 20 : ten at every jaw 8 incisors,
4 canines and
8 primary molars

The deciduous teeth of the primary dentition are smaller than the teeth of the same type in the permanent dentition, but they generally resemble in form.



molars | **canines** | **incisors** | **canines** | **molars**

- The deciduous teeth are 20 in number.
- They have the following formula:

-
-

Dental formula

	I	C	M	
Deciduous	<u>2</u>	<u>1</u>	<u>0</u>	<u>2</u>
	2	1	0	2
	= 10			(For each side)

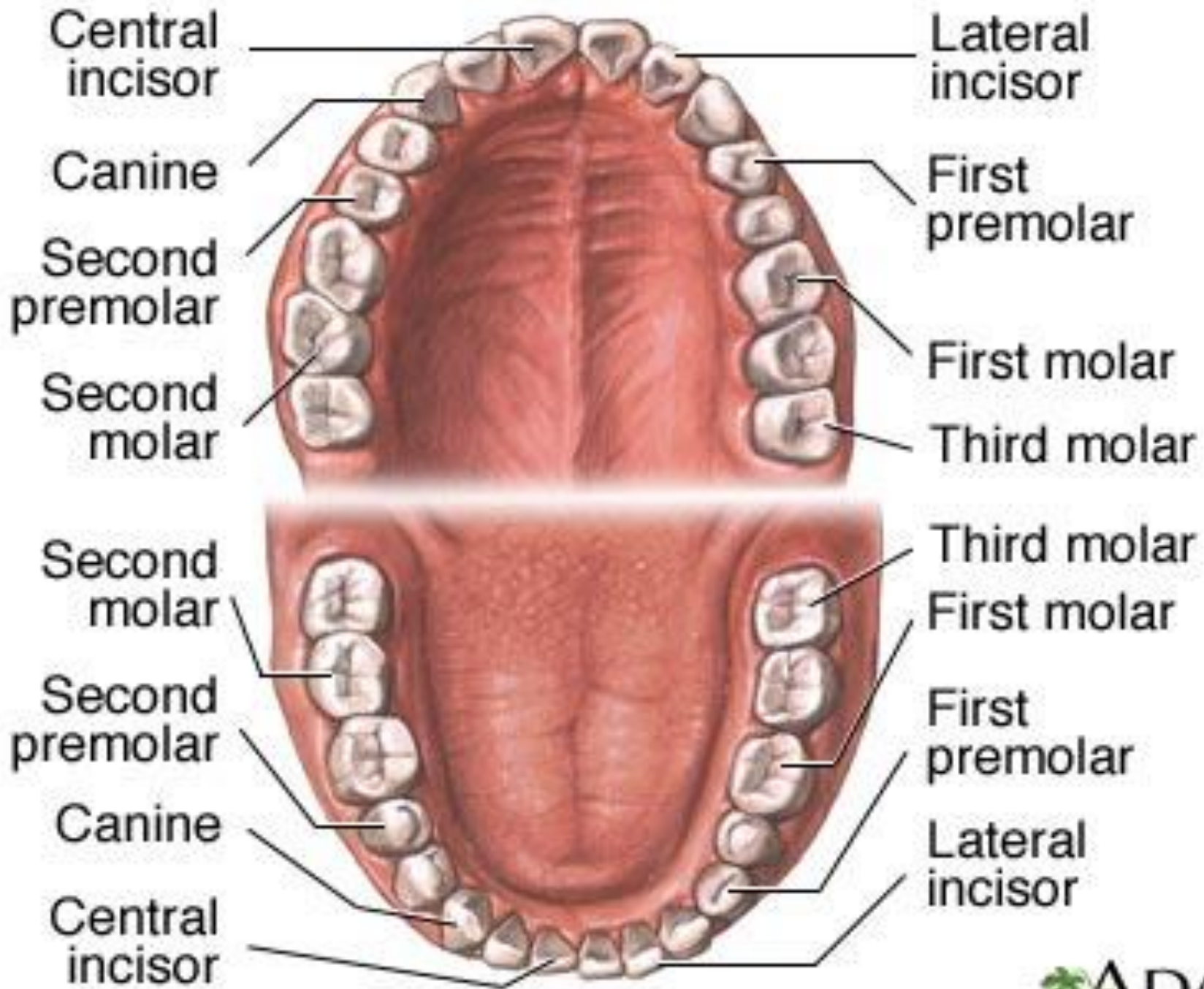
I=Incisors (central and lateral)

C=canine

M=molars (first and second)

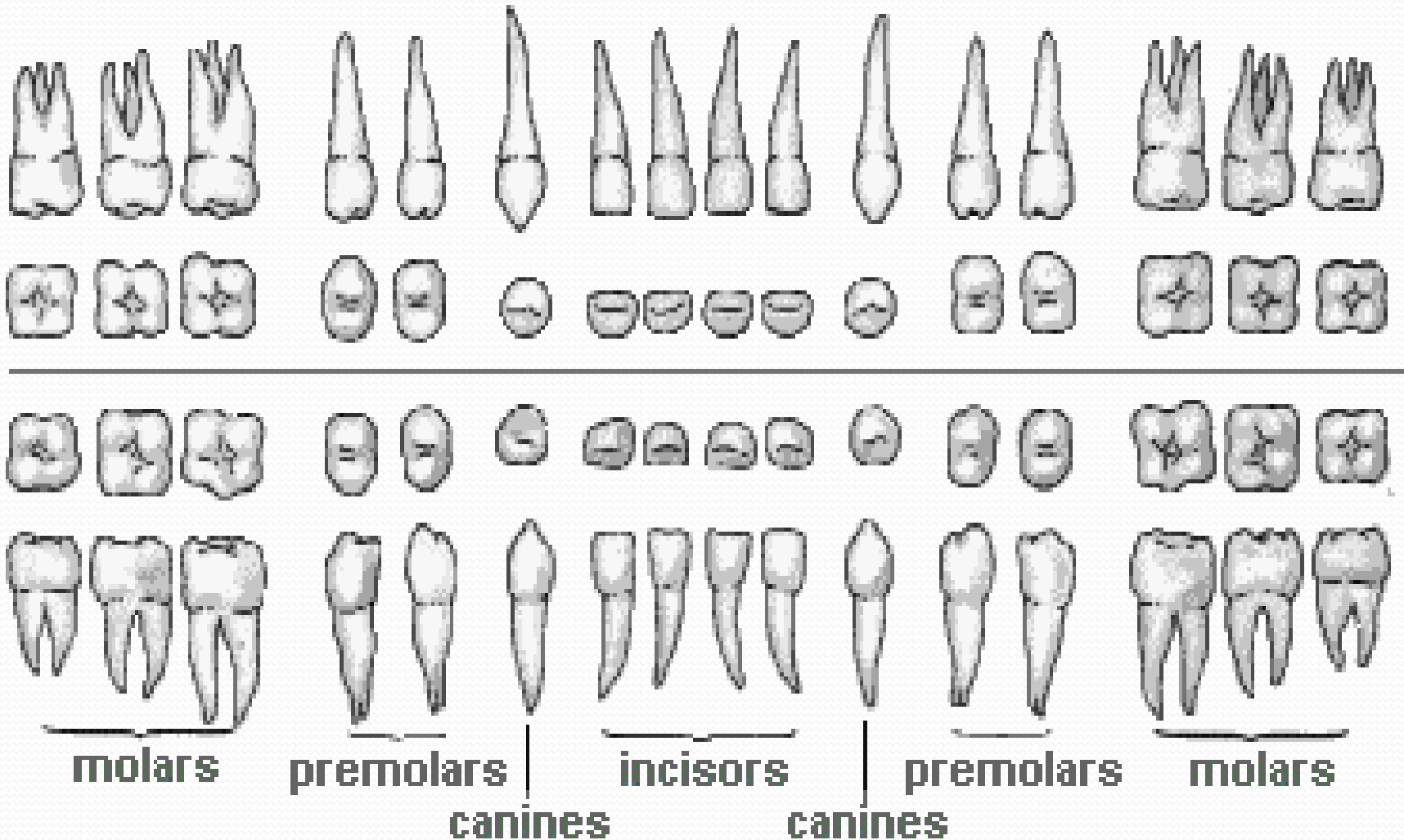
The permanent teeth

- The transition to permanent dentition begins with **the** emergence and eruption of the 1st permanent molars at the age of six years , followed by shedding of the deciduous teeth and the emergence and eruption of the remaining permanent teeth.
- This process requires about 20 years to be completed.
- The number of permanent teeth , including third molars when present , is 32.



There are four different types of teeth in the mouth of an adult human.

The complete dentition of an adult person has 32 teeth.



Dental Formula

$$\begin{array}{l} \text{Permanent} \quad \begin{array}{cccc} \text{I} & \text{C} & \text{P} & \text{M} \\ \hline 2 & 1 & 2 & 3 \\ 2 & 1 & 2 & 3 \end{array} \quad = 16 \quad (\text{for each side}) \end{array}$$

I=Incisors (central and lateral)

C=canine

P=premolars (first and second)

M=Molars (first , second and third)

- The premolars are often called **bicuspid**s. This is a misnomer. Because **Not all** premolars have two (bi) cusps. The mandibular second premolars often have three cusps. Therefore the term premolar is more descriptive.
- The permanent teeth that replace the primary teeth (20) are described as **succedaneous teeth**.
- The permanent teeth that do not replace primary teeth are described as **nonsuccedaneous teeth (12 molars)**.

MIXED DENTITION



Late childhood
(school age)

Tooth Eruption

	<u>Deciduous</u>	<u>Permanent</u>
<u>Incisors</u>	6 - 10 months	6 - 8 years
<u>Canine</u>	16 - 20 months	11 years
<u>Premolars</u>		11 - 13 years
<u>Molars</u>	10 - 24 months	6 - 25 years

The teeth

- Teeth are grouped into:
- 1. Anterior teeth: which include the incisors and the canines.
- 2. Posterior teeth: which include the premolars and molars.

The jaw

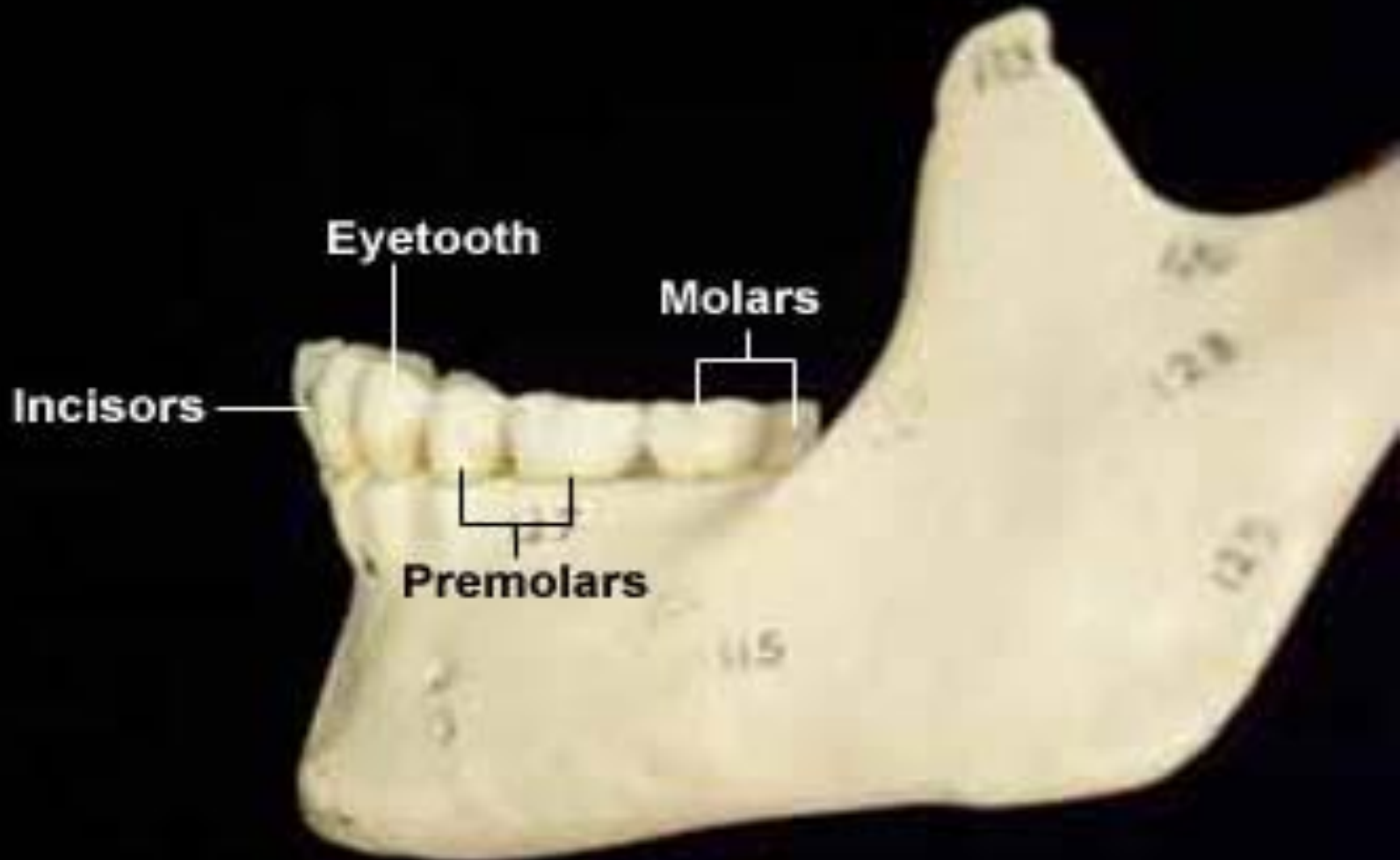
- Each tooth is surrounded and supported by bone.
- This bony process is called the **alveolar process**.
- The bony socket into which the teeth are set is called the **alveolus**. The **jaw** is the bone which carries the teeth.
- There are two jaws:
- 1. The upper jaw: which is fixed , and is called “The maxilla”
- 2. The lower jaw: which is movable, and is called ”The mandible”

Occlusion

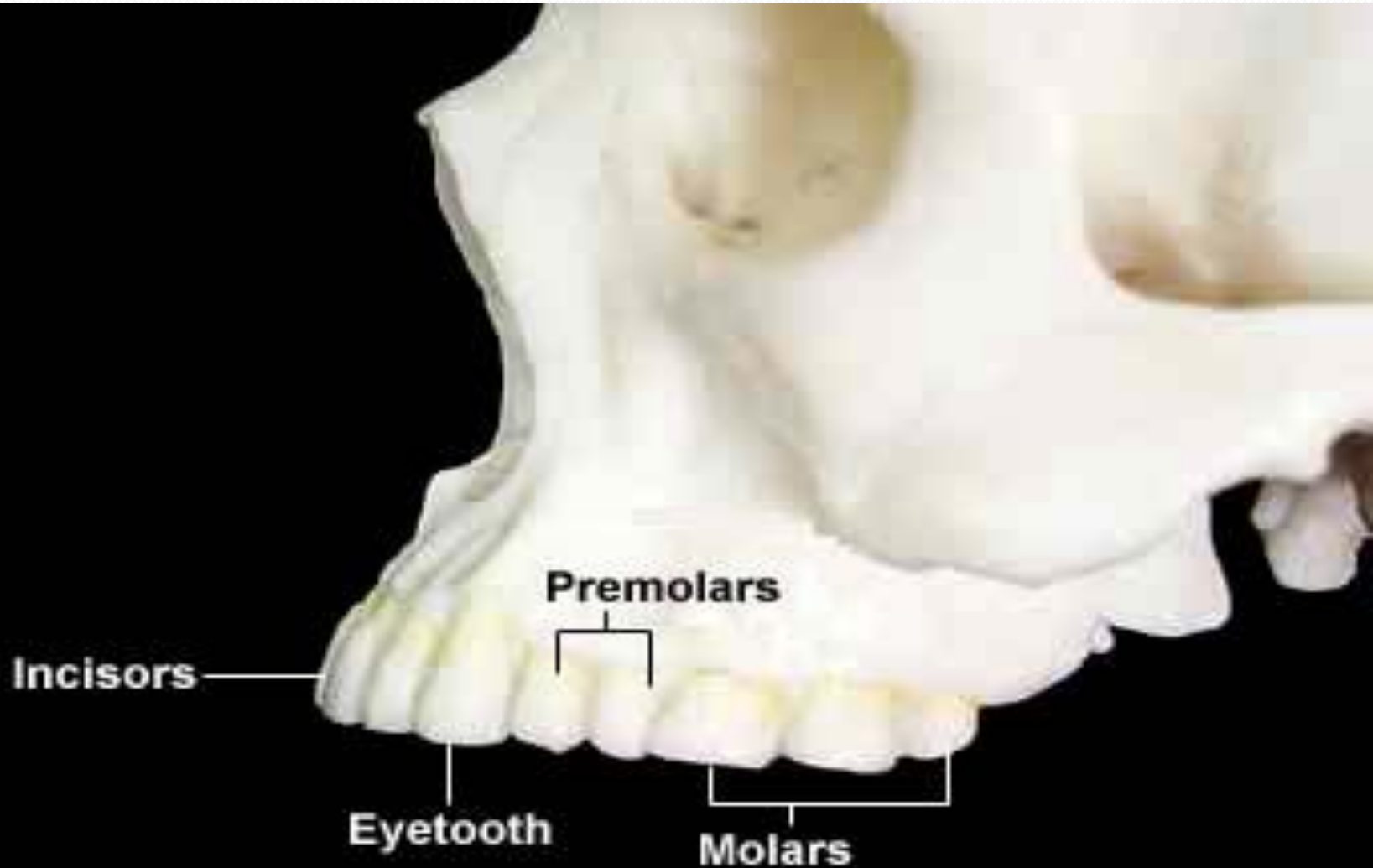
- As the mandible is raised, the teeth of the mandibular arch come in contact with those of the fixed maxillary arch and are said to be in **occlusion**.
- **Identification:** When identifying a specific tooth, we list in sequence (**Dental Nomenclature**)

	EXAMPLE 1	EXAMPLE 2
1. DENTITION	Permanent	Deciduous
2. ARCH	Maxillary	Mandibular
3. SIDE	Right	Left
4. TOOTH NAME	1st Premolar	Central Incisor

Lower teeth



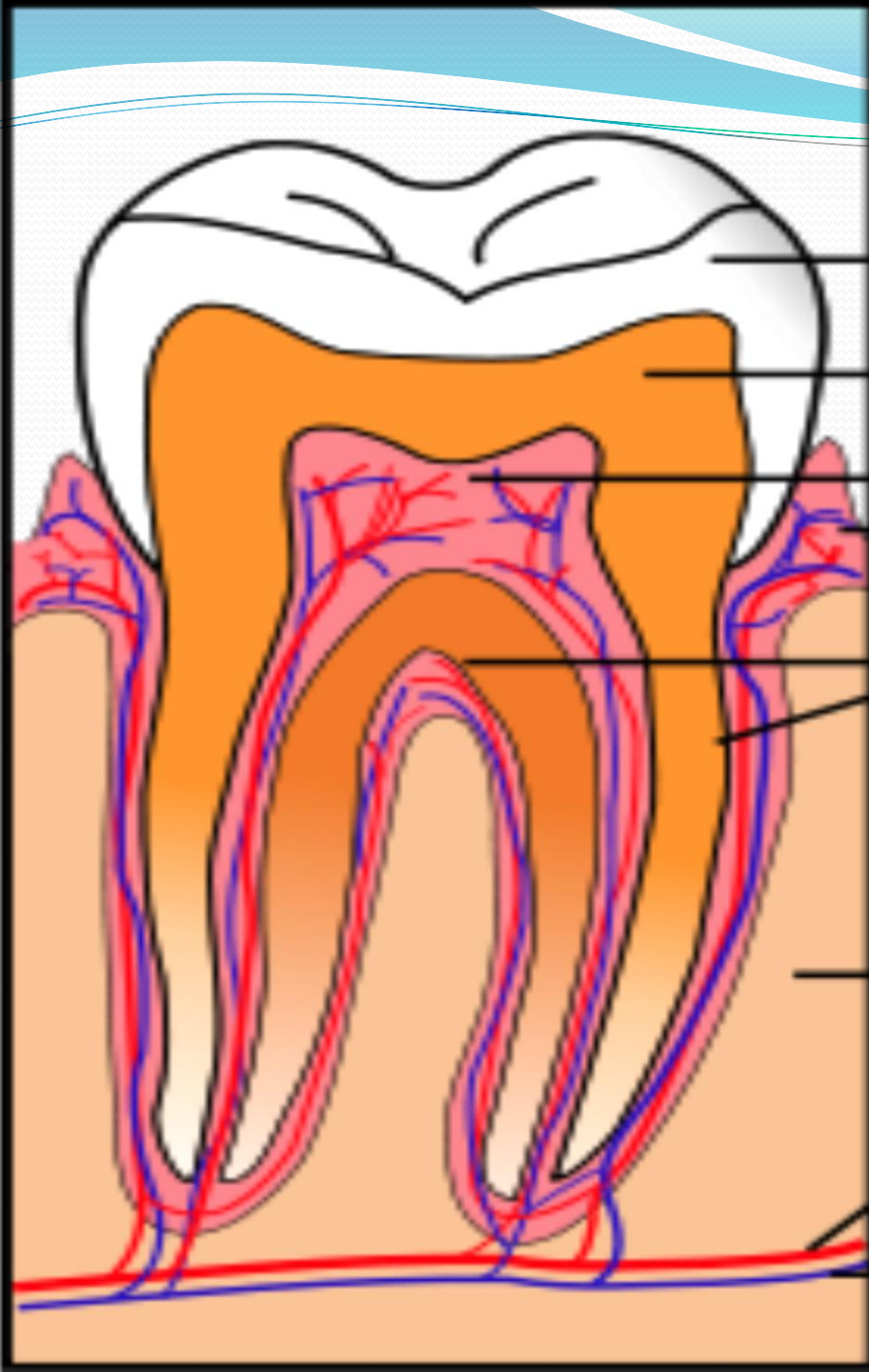
Upper teeth



GENERAL MORPHOLOGY OF TEETH

- **1. Tooth Tissues**
- **i. Enamel:** The hard acellular substance that normally covers the crown of the teeth; hardest substance in the body.
- **ii. Cementum:** A bonelike substance that covers the roots of teeth.
- **iii. Dentin:** The hard substance that forms most of the root and a major portion of the crown; it is harder than cementum but not as hard as enamel.
- **iv. Pulp:** The soft tissue within the dentin providing blood supply, innervation and connective tissue. The primary function of the pulp is to produce dentin.

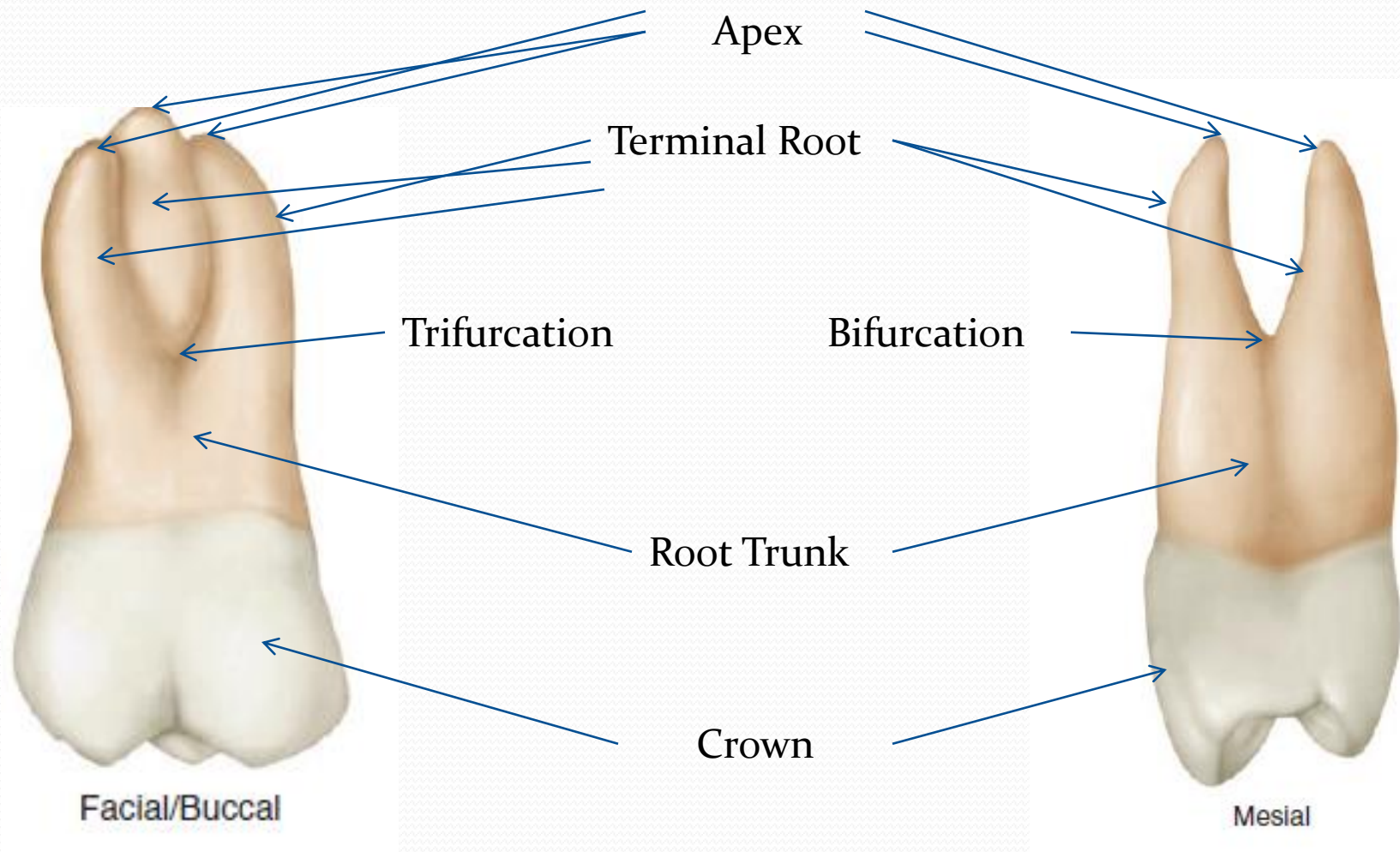
C
R
O
W
N
C
E
R
V
I
X
R
O
O
T



Enamel
Dentine
Pulp
Gingiva
Cementum
Bone
Blood vessel
Nerve

2. Tooth Parts

- Each tooth is divided into two parts, the crown and the root, between them there is the cervix
- 1. Crown
 - a. **Anatomic crown:** that portion of the tooth covered with enamel
 - b. **Clinical crown:** that portion of the tooth that is normally visible in the oral cavity and exposed to the fluids of the mouth
- 2. **Root:**
 - normally embedded in the alveolar process and may be single branch or root (anterior teeth) or divided into two or three branches (posterior teeth)
 - a. **Anatomic Root:** that portion of the root covered by cementum
 - b. **Clinical Root:** that portion of the tooth that is embedded in the periodontal (surrounding the tooth) tissues
 - **Bifurcation:** a forking or division of the root trunk into two branches
 - **Trifurcation:** a division of the root trunk into three branches
 - **Root Trunk:** the base of the root of a multirrooted tooth
 - **Terminal Roots** the roots branching from a root trunk
 - **Apex: terminal** end or tip of the root.
 - **Apical Foramen:** opening at or near the apex of the tooth through which vessels and nerves pass.



Apex

Terminal Root

Trifurcation

Root Trunk

Crown

Bifurcation

Facial/Buccal

Mesial

The number of roots:

- ❖ 1. Single roots: in all anterior teeth, mandibular premolars and maxillary second premolars.
- ❖ 2. two roots with bifurcation: in mandibular molars and maxillary first premolars.
- ❖ 3. three roots with trifurcation: in maxillary molars.

❖ Surfaces and Ridges

- ❖ The crowns of incisors and canines have 4 surfaces and a ridge and the crowns of premolars and molars have 5 surfaces.

The surfaces are:

- ❖ **1.Labial surface:** is the surface which is towards the lip in incisors and canines (=in anterior teeth)
- ❖ **2.Buccal surface:** is the surface which is towards the cheek in premolars and molars (=in posterior teeth).
- ❖ The labial and buccal surfaces could be termed as the “ **Facial surfaces** “
- ❖ **3.Lingual surface:** is the surface which is facing the tongue (all teeth).
- ❖ **4.Occlusal surface:** is the surface of posterior teeth coming in contact with the teeth in the opposite jaw during closing the mouth.
- ❖ In anterior teeth this surface is called “ Incisal ridge”.

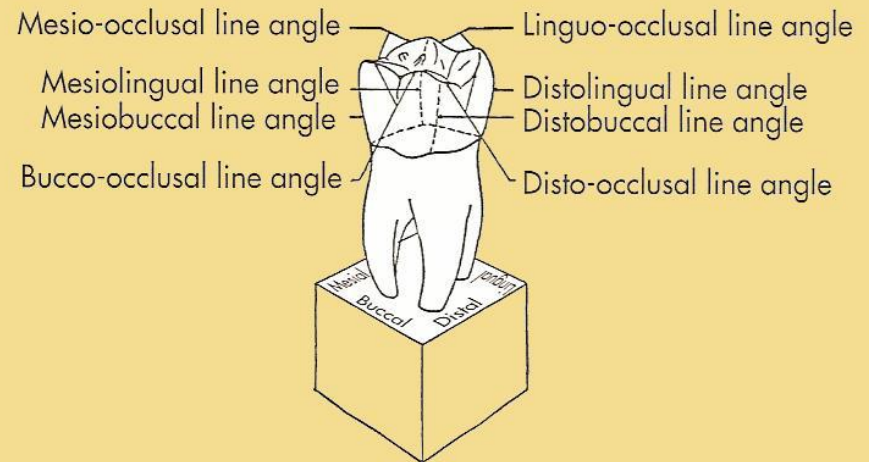
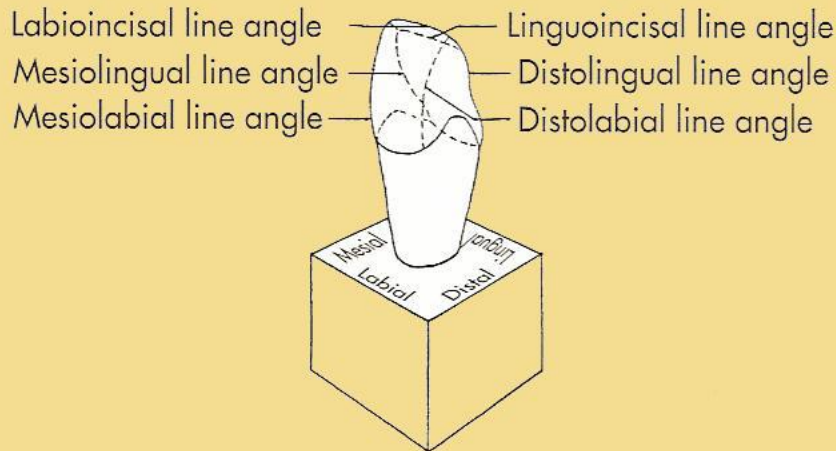
5. Proximal surface: is the surface of the tooth facing towards adjacent teeth in the same dental arch.

- ❖ **A. Mesial surface:** is the surface which is facing towards the median line.
- ❖ **B. Distal surface:** is the surface which is facing away from the median line.
- **Contact area: portion of the proximal surface that** touches the adjacent tooth
- **diastema:** space between teeth if the adjacent surfaces do not touch
- ❖ All teeth have their mesial surfaces touching the distal surfaces of the adjacent tooth except the maxillary and mandibular central incisors (both permanent and deciduous).

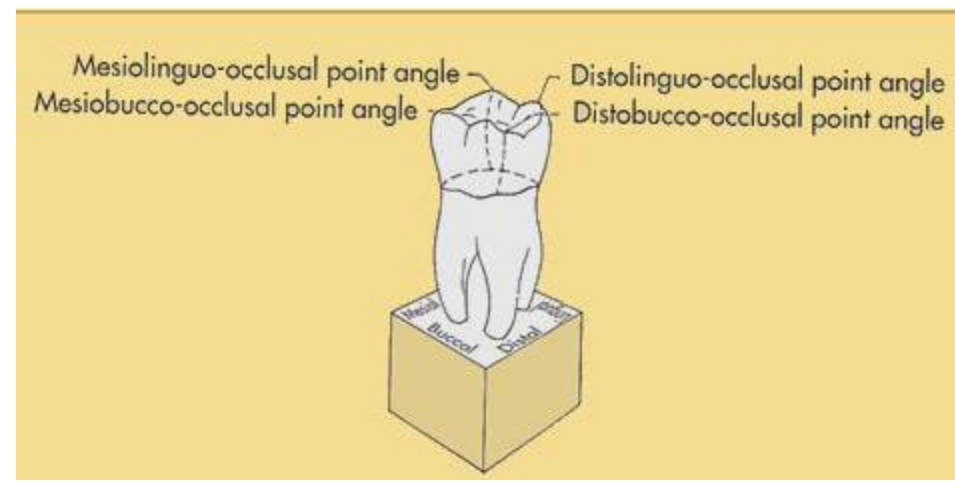
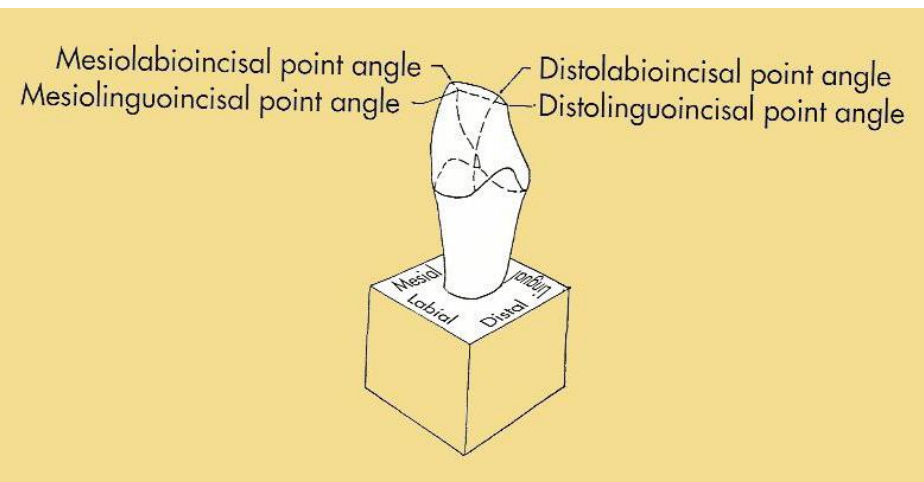
Tooth surfaces



- ❖ Line angle: it is formed by the junction of two surfaces and gets its name from these surfaces.
- ❖ Example: mesio-labial line angle.
- ❖ Point angle: it is formed by the junction of three surfaces and gets its name from these surfaces.
- ❖ Example: mesio-linguo-Incisal point angle.



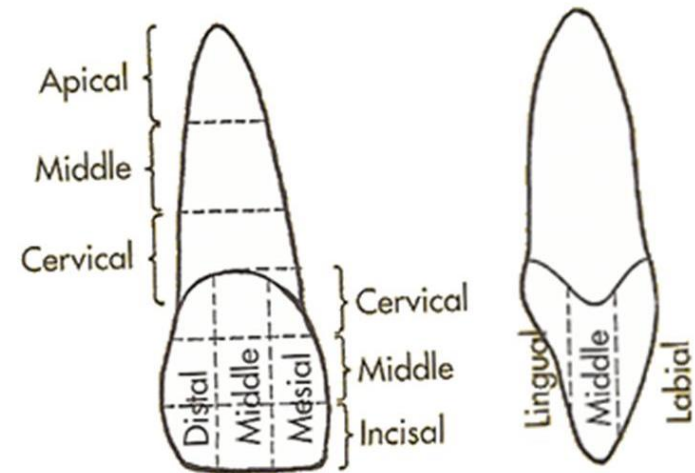
- ****Procedure for combining terms for naming line angles and point angles:**
- 1. **Mesial and distal** precede all other terms. e.g. Mesio Buccal line angle; disto linguo incisal point angle
- 2. **Facial (labial, buccal) and lingual** follow mesial and distal AND precede incisal or occlusal in any combination. e.g. Distolabial line angle; labio incisal line angle;
- 3. **Incisal and occlusal occur last in any combination.** e.g. Linguo incisal line angle; disto occlusal line angle; mesio linguo occlusal point angle



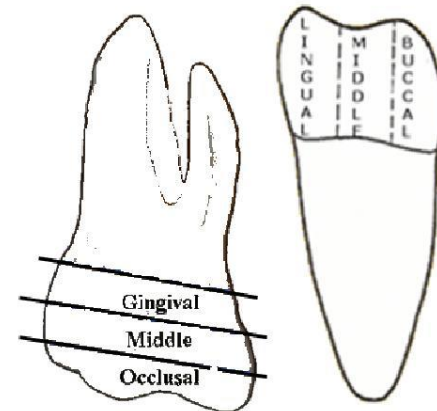
Division of the crown into thirds:

❖ For description , the crown and the root are divided into thirds according to the position of the surface.

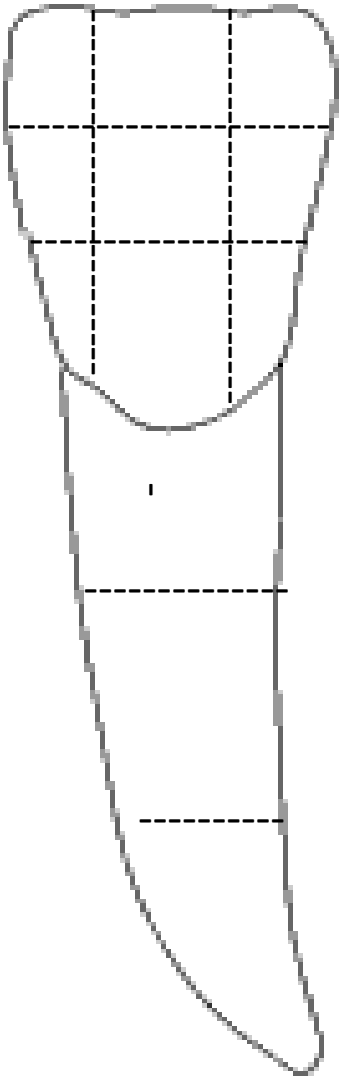
❖ 1- For anterior teeth



❖ 2- For posterior teeth



M M D
e i i
s d s
i d t
a l a
l e l



← Incisal Occlusal →

← Middle →

← Cervical →

← Cervical →

← Middle →

← Apical →

M M D
e i i
s d s
i d t
a l a
l e l

