

Dental Anatomy

Lec. I

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Oral & Maxillofacial pathology

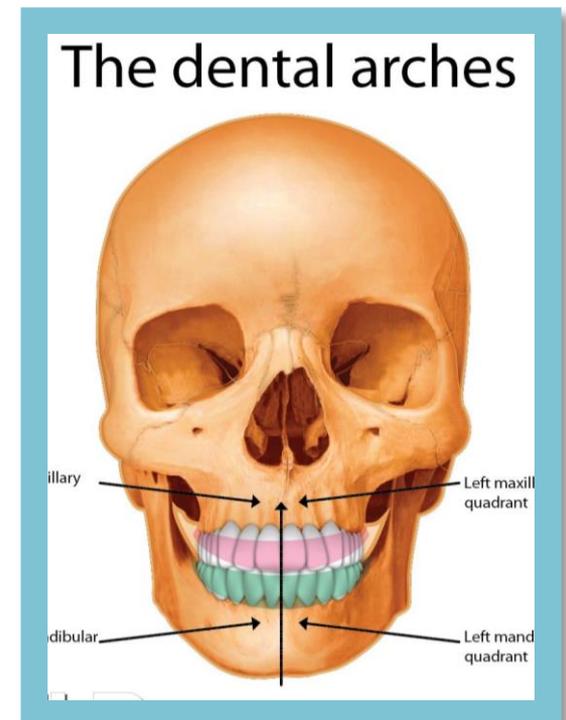


Dental anatomy includes

= Study of surface anatomy of teeth;
(externally and internally),
= their arrangement in the dental arches
= their relationship to each other and to the
skull bone.

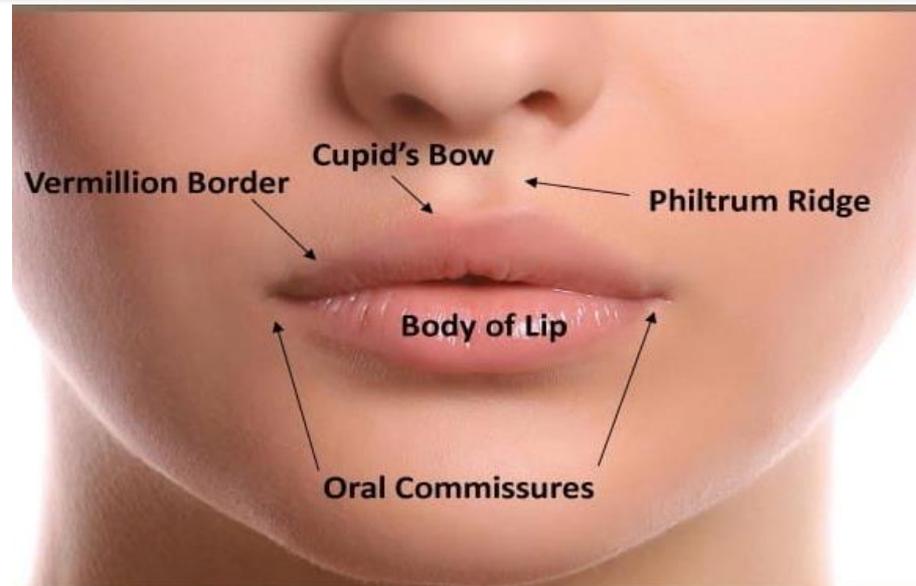
Upon looking into the lower facial third
and the oral cavity you can see:

- 1-Lips
- 2- Gingiva
- 3-Cheek
- 4-tongue
- 5-Floor of the mouth
- 6-Roof of the mouth
- 7-Teeth



Lips:

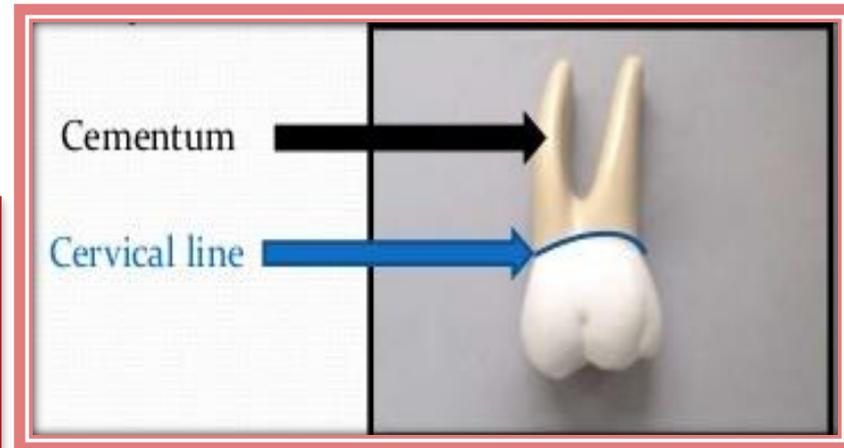
There are two lips upper and lower lip .
The corner of the mouth where they meet is called commissure .



Gingiva

It is that part of the masticatory tissue that surrounds the cervical part of teeth .

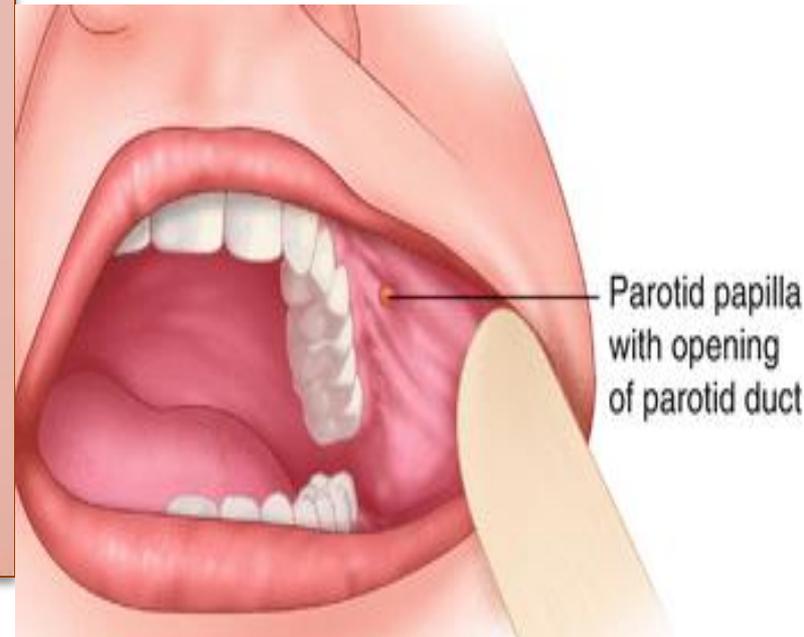
It is firmly attached to the teeth and their surrounding bone.



cheek

The lining of the inside of the cheeks is shiny with a white line called **linea alba buccalis** running posteriorly on each side at the level where the upper and lower teeth come together.

The parotid papilla: it is a round elevation of tissue observed on the cheek between first and second molar at just above the occlusal plane.

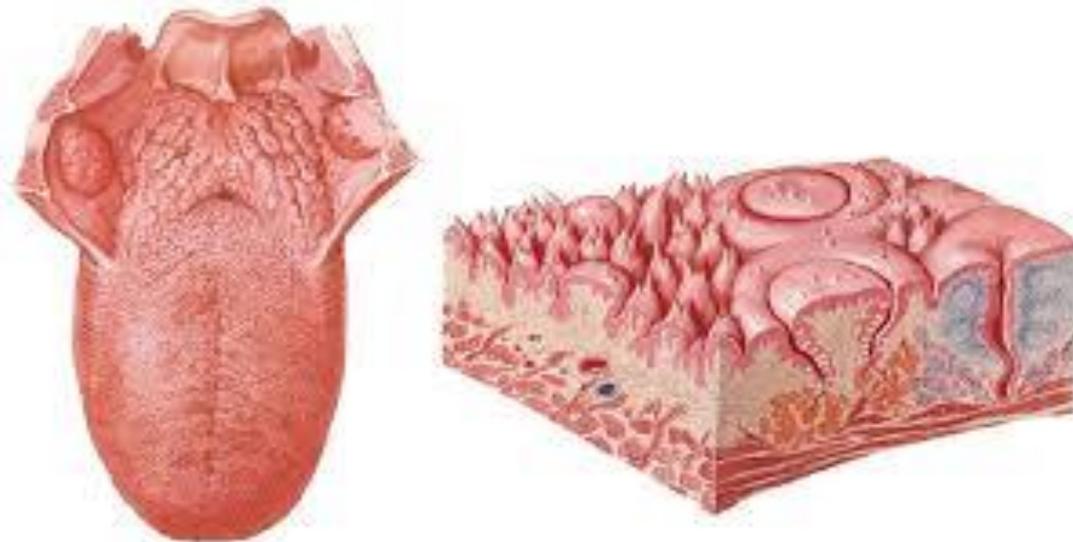


Tongue

It is broad flat organ composed of muscle fibers and glands .

It rests in the floor of the mouth and manipulates food for mastication .

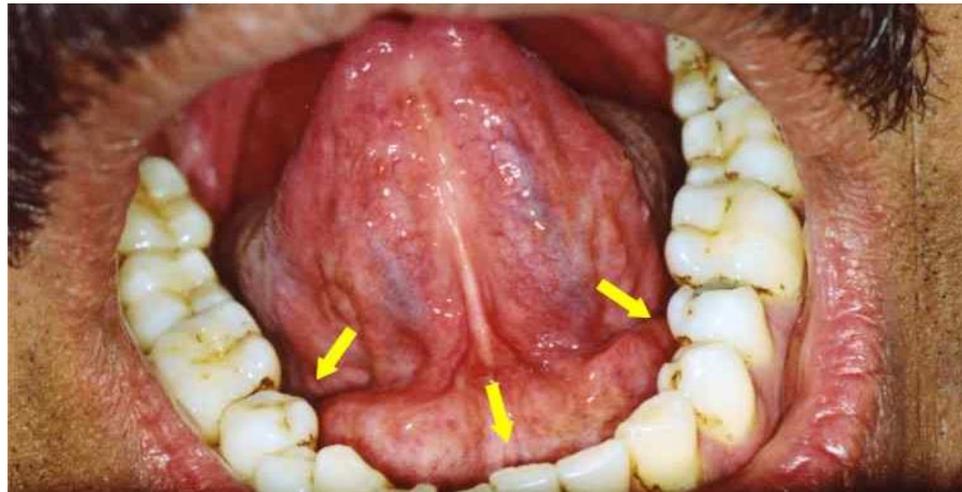
It is the principle organ of taste.



Floor of the mouth

It is shiny and some large blood vessels may be seen near the surface .

Beneath the tongue there are two bilateral bulges caused by the presence of large salivary glands.



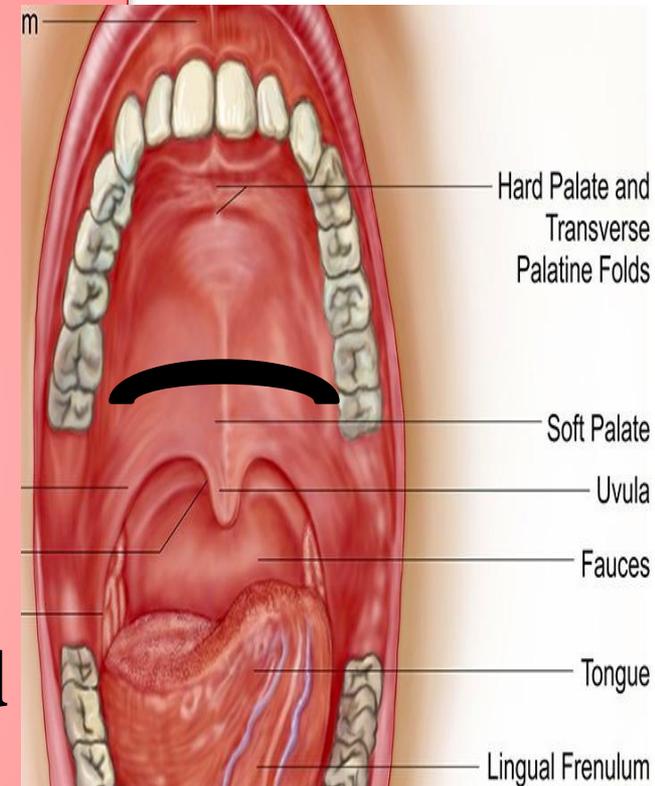
Roof of the mouth (Palate)

It is anterior part is named as **hard palate**.

The end of the hard palate is opposite to the third molar.

The **soft palate** is sometimes redder than hard palate.

The junction between hard and soft palate is called **vibrating line**.



Teeth

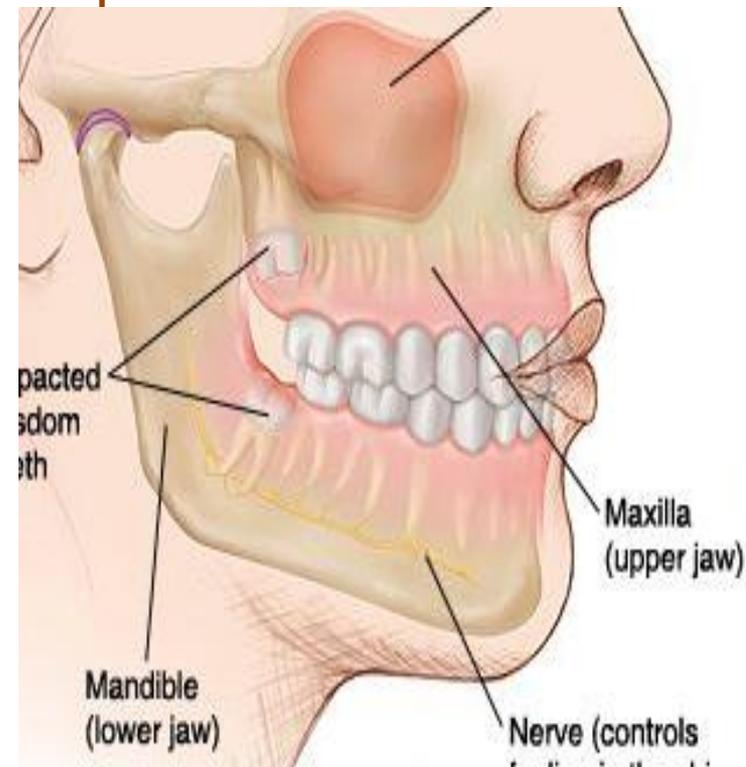
Human teeth are arranged in the oral cavity in two arches called **dental arches** one upper and one lower.

The upper arch is attached to the maxilla.

The teeth of upper dental arch are called upper or **maxillary teeth**.

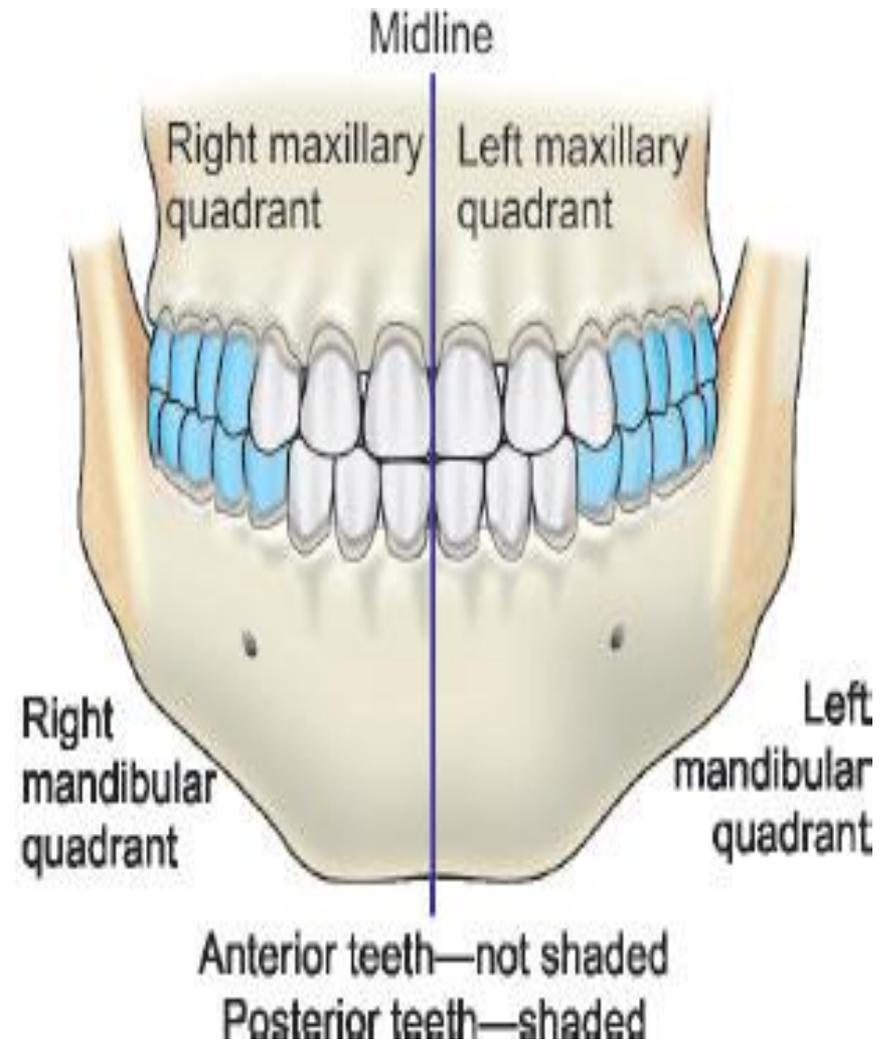
The lower dental arch is attached to a movable bone called the mandible which joins the skull at the **temporo-mandibular joint**.

The teeth of lower dental arch are called lower or **mandibular teeth**.



Each dental arch can be divided into nearly equal halves by imaginary vertical line called the **midline**.

The right and left halves in each arch are called quadrant .



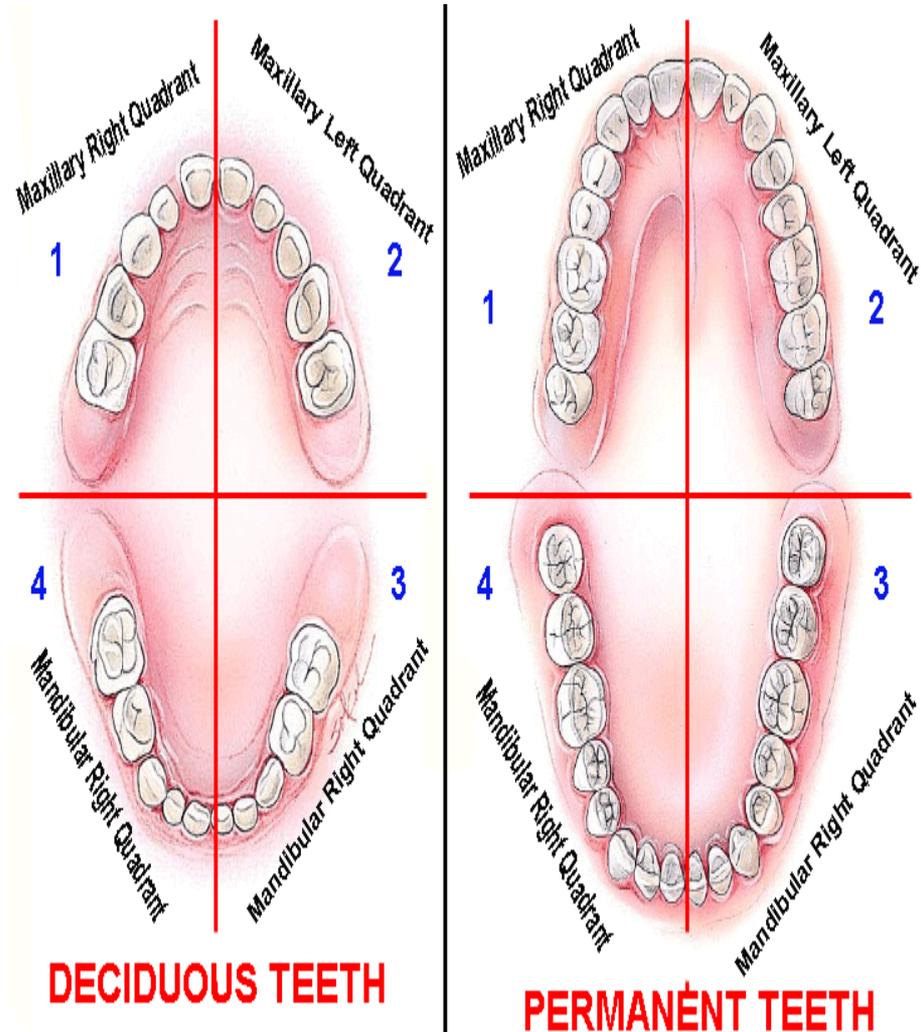
There are four quadrants in the oral cavity which includes:

A- maxillary (upper) right quadrant.

B- mandibular (lower) right quadrant.

C- maxillary (upper) left quadrant.

D- mandibular (lower) left quadrant.



In the oral cavity there are four types of teeth that includes:

1- Incisors:

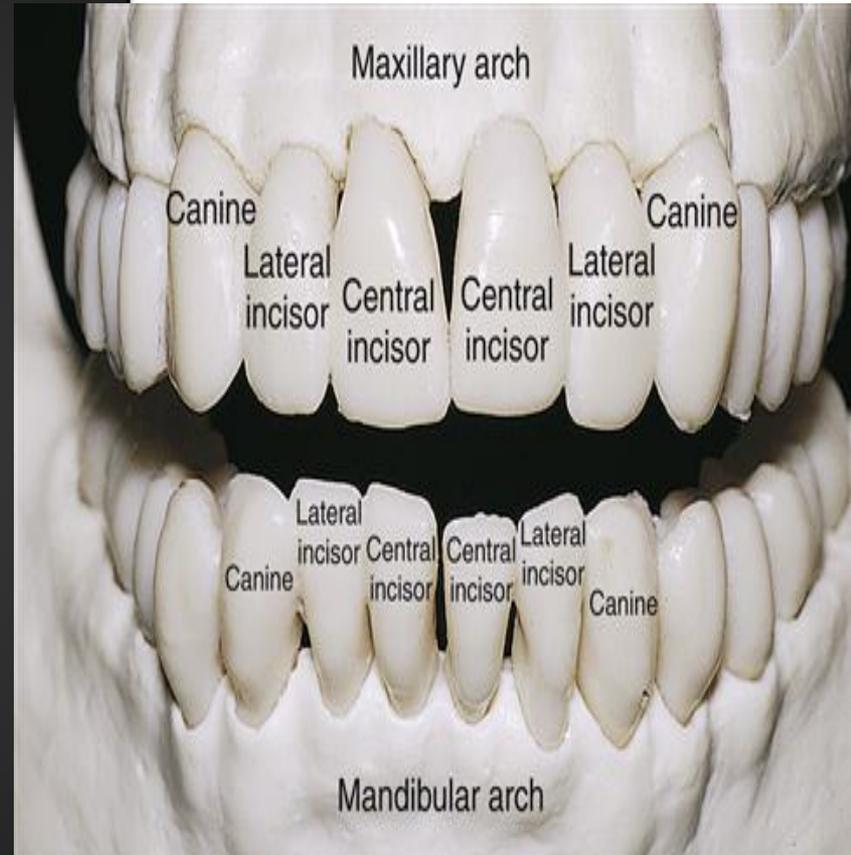
They are the two front teeth in each quadrant.

The central incisor is the first tooth next to the midline. The lateral incisor is the second.

2-Canine (cuspid):

There is one canine in each quadrant .

It is the third tooth from the midline in each quadrant.



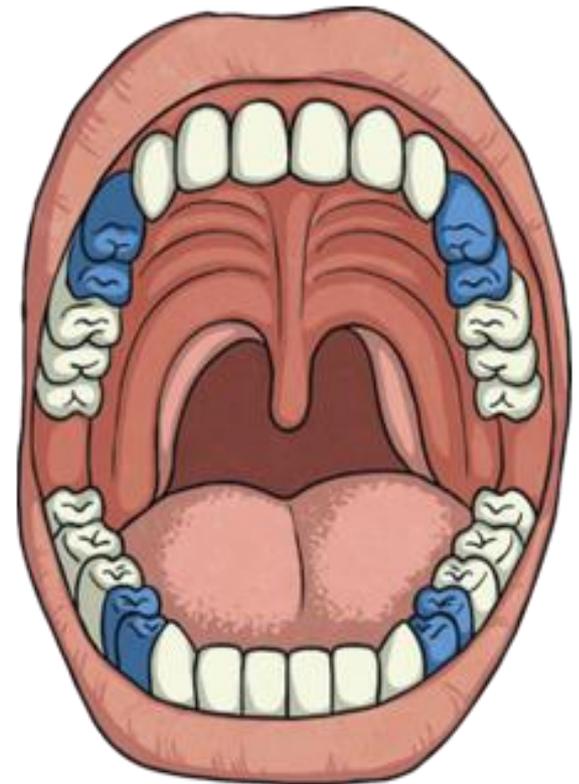
In the oral cavity there are four types of teeth that includes:

3-Premolars (bicuspid):

There are two premolars in each quadrant. They are the fourth and fifth teeth from the midline.

The fourth tooth is the first premolar.

The fifth tooth is the second premolar.



In the oral cavity there are four types of teeth that includes:

4-Molars:

There are three molars in each quadrant.

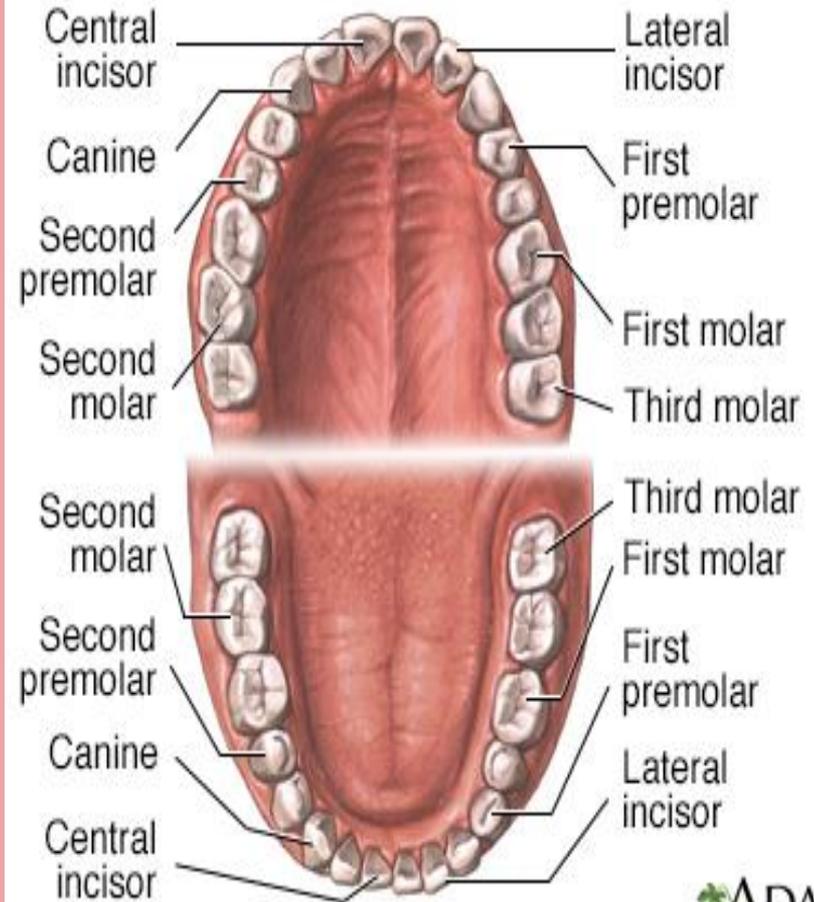
The **sixth** is the first molar.

The **seventh** is the second molar.

The **eighth** is the third molar.

The incisors and canines are considered **anterior teeth** since they are closer to the midline.

Molars and premolars are considered **posterior teeth** since they are farther from the midline.

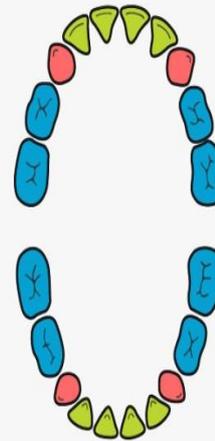


Overview of the Human Dentitions

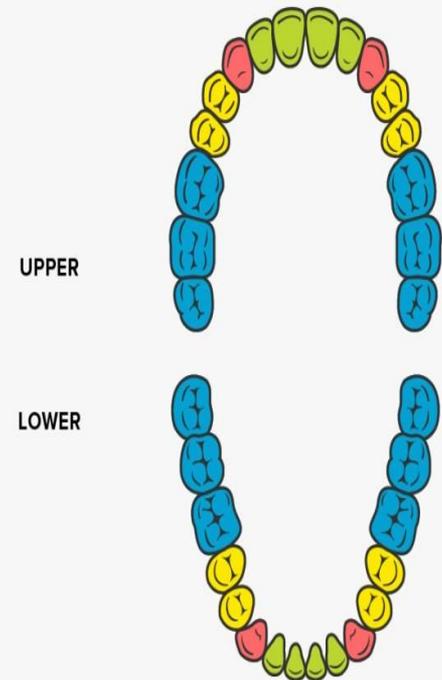
Humans have two dentitions; the **primary** and **permanent** .

There is a transitional phase when both dentitions are present in the oral cavity is called **mixed dentition** .

PRIMARY TEETH



SECONDARY TEETH



UPPER

LOWER



incisors



canines



premolars



molars

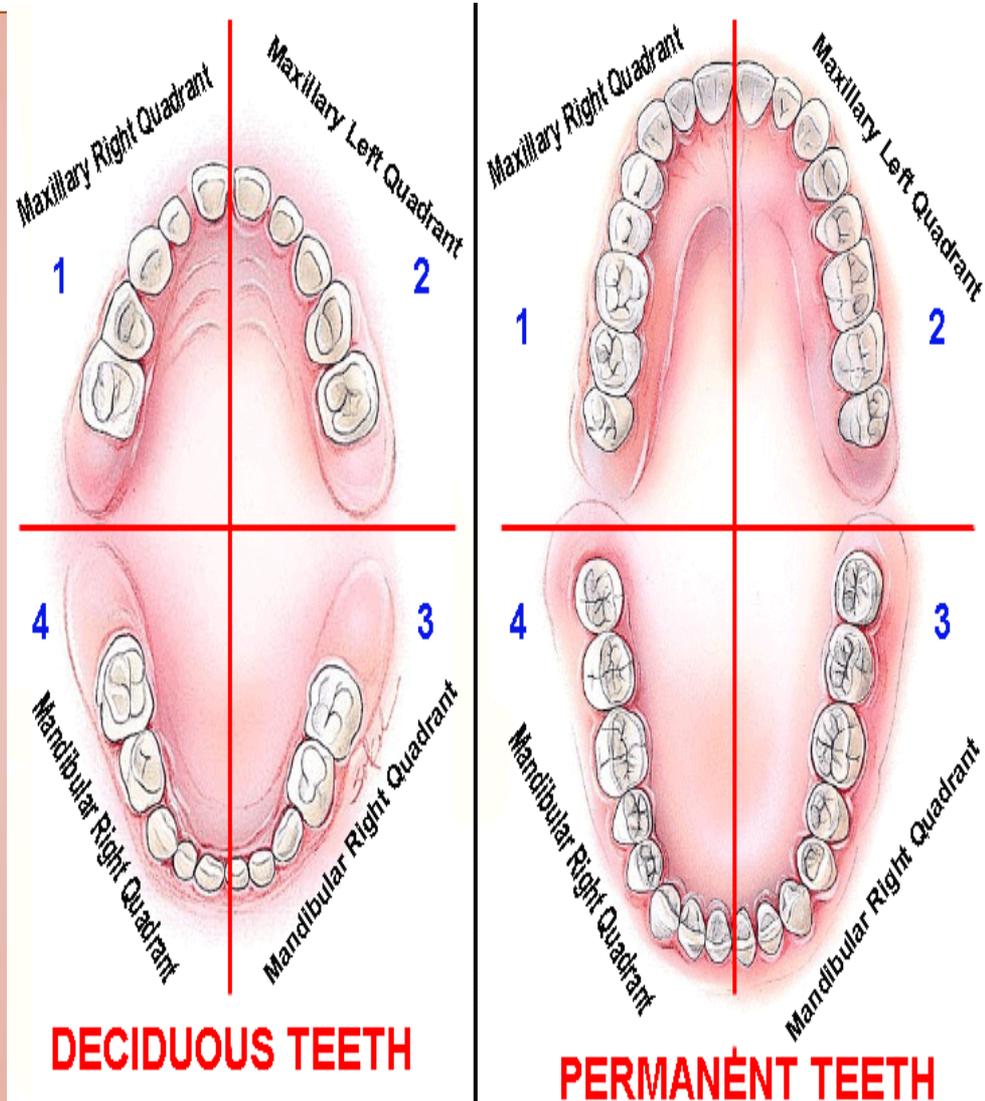
The primary dentition

They are 20 in number
, 10 maxillary and 10
mandibular ,

5 in each quadrant

Each quadrant contains 3
types of deciduous teeth
which are:

- 1- two incisors.
- 2- one canine
- 3- two molars.



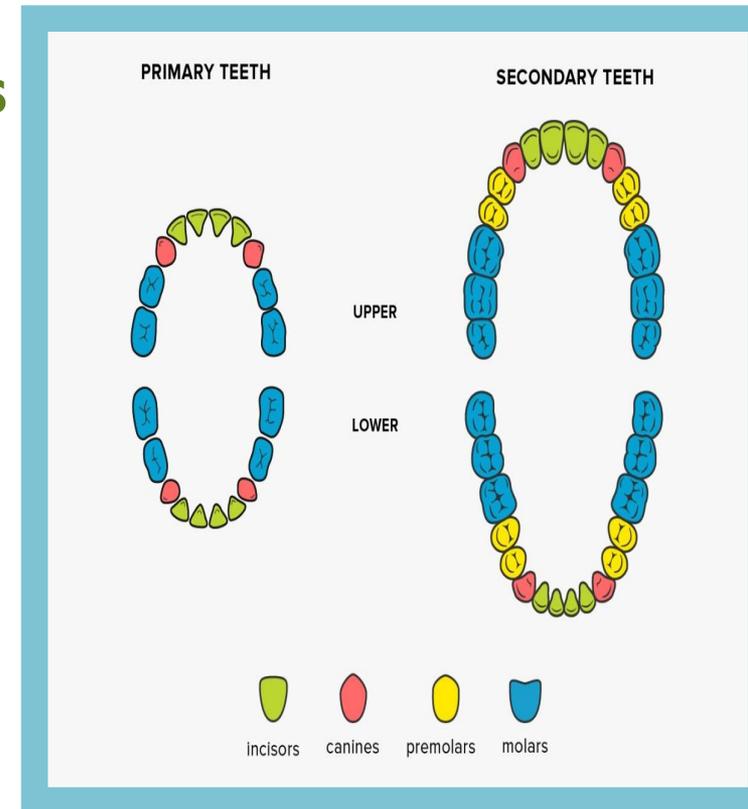
The primary dentition

This is called the deciduous dentition.

This begins at 6 months and ends at 6 years.

The eruption of primary teeth begins at 6 months (for lower central incisor) and ends at 2 years (for the upper second deciduous molar).

These teeth are also called milk teeth , baby teeth, or temporary teeth.



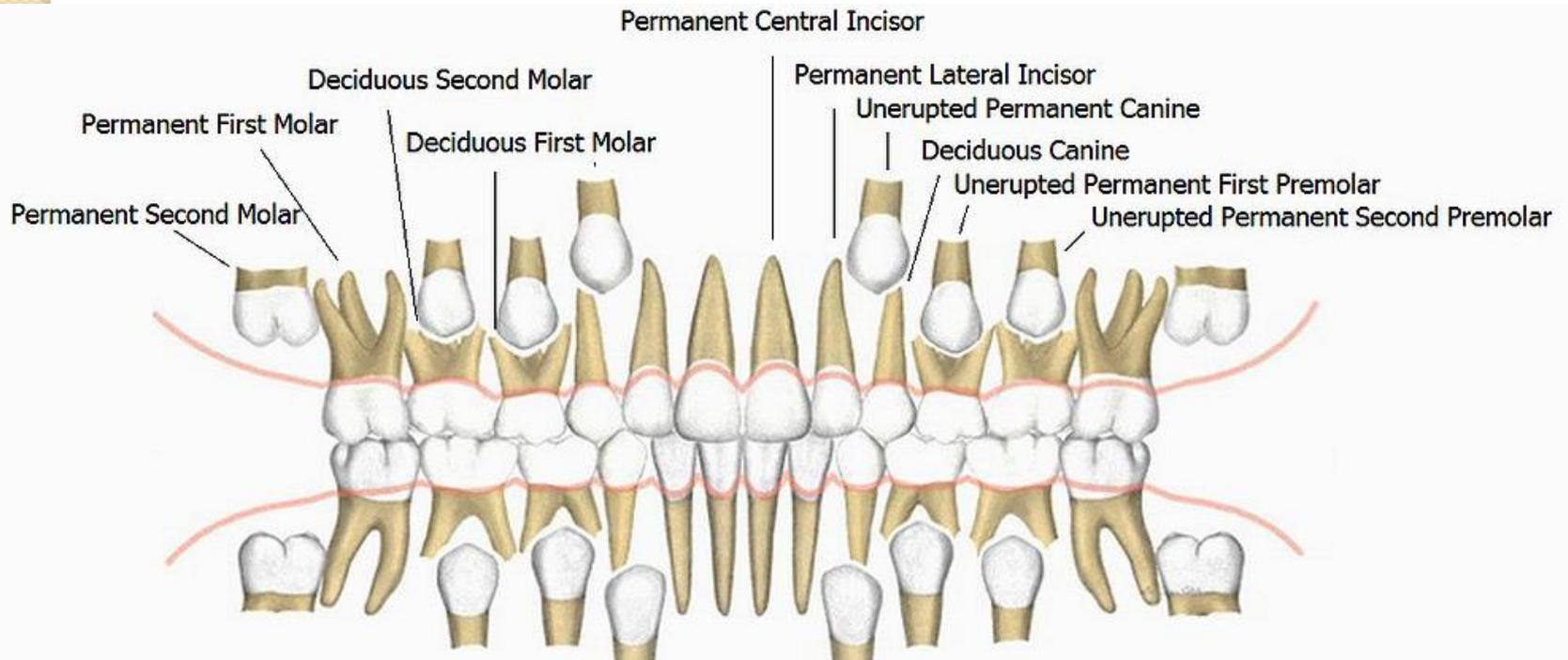
Mixed dentition

This period begins with the eruption of the **first permanent molar** at about **6 years**.

It ends around the age of **12**.

At this period the deciduous teeth exfoliate or shed and the permanent teeth erupt into their places.

Shedding ; it is the physiological loss of the deciduous teeth and their subsequent replacement by permanent teeth.



Mixed dentition



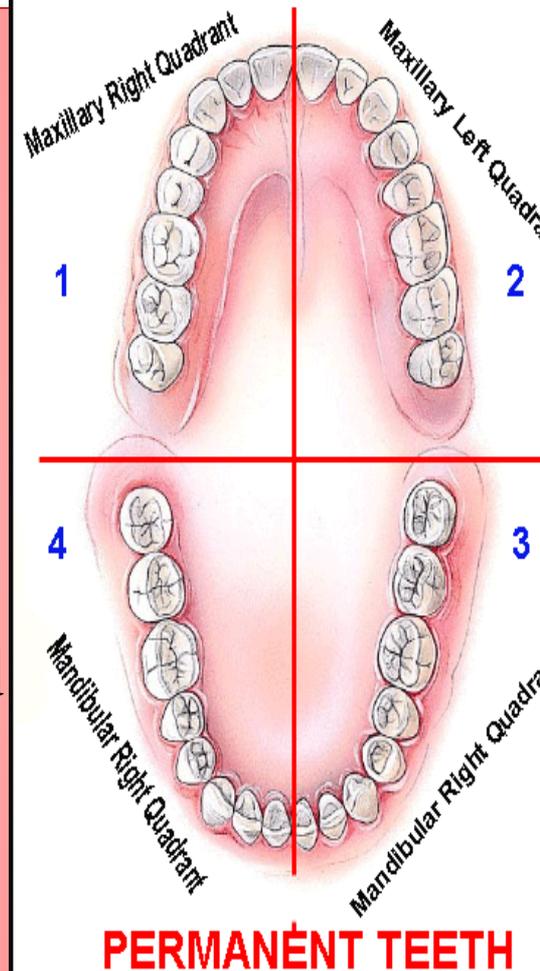
Permanent dentition

It is also called the **secondary , adult or succedaneous** dentition since many of these permanent teeth succeed deciduous teeth.

This dentition begins at approximately **12 years** and persists throughout the lifespan of the teeth.

There are **32** permanent teeth, **16** maxillary and **16** mandibular .

In each quadrant **8** teeth are present 2 incisors , 1 canine , 2 premolars and 3 molars.



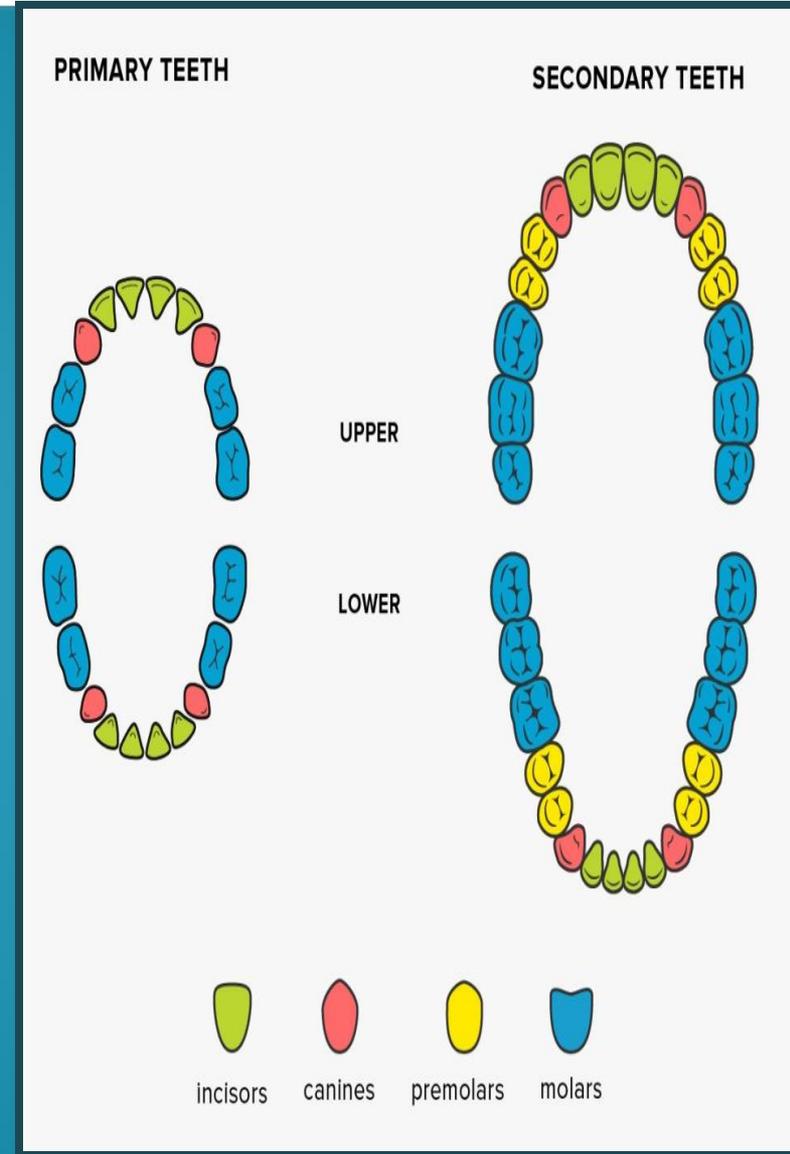
It is important to keep in mind that

Deciduous molars are succeeded by a group of teeth named as premolars which are not present in deciduous dentition .

All permanent molars are not preceded with deciduous teeth. So they may be termed non succedaneous teeth.

They represent an extra number of permanent teeth to that of the deciduous teeth.

Total number of permanent teeth will exceed that of the deciduous teeth with 12 (3 molars in each quadrant).



Dental Formula For Mammalian Teeth

The type and number of all mammalian teeth are expressed by formula that it is used to differentiate human dentition from that of other experimental animals.

The dental formula includes deciduous and permanent dentition.

Also it indicates the dentition of one side of the mouth (upper and lower).

Human dental formula for *deciduous teeth*

$$I - 2/2 \quad C - 1/1 \quad PM - 0/0 \quad M - 2/2 = 10$$

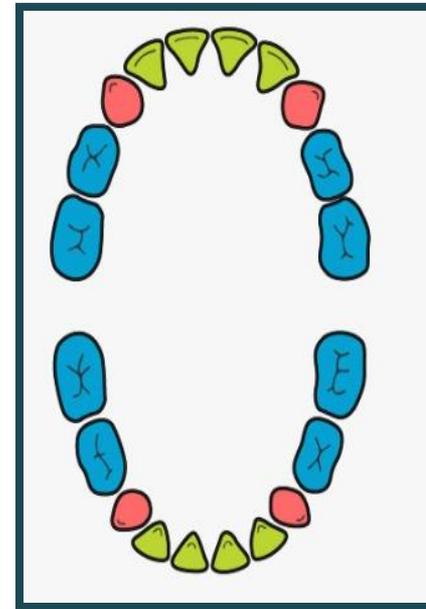
Incisors (I): 2 maxillary and 2 mandibular

Canine (C) : 1 maxillary and 1 mandibular

Premolars (PM): Absence of these teeth.

Molars (M): 2 maxillary and 2 mandibular.

The total number of the human deciduous teeth is 10 teeth for one side upper and lower dental arch.



Human dental formula for permanent teeth

I—2/2 C—1/1 PM—2/2 M—3/3 = 16

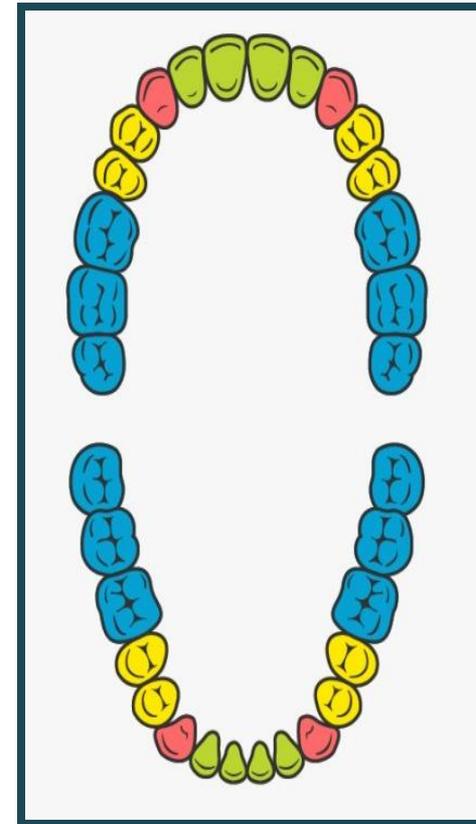
Incisors (I) : 2 maxillary and 2 mandibular

Canines (C): 1 maxillary and 1 mandibular

Premolars (PM): 2 maxillary and 2 mandibular

Molars (M) : 3 maxillary and 3 mandibular

The total number is 16 teeth for one side upper and lower dental arch.





The End

Dental Anatomy

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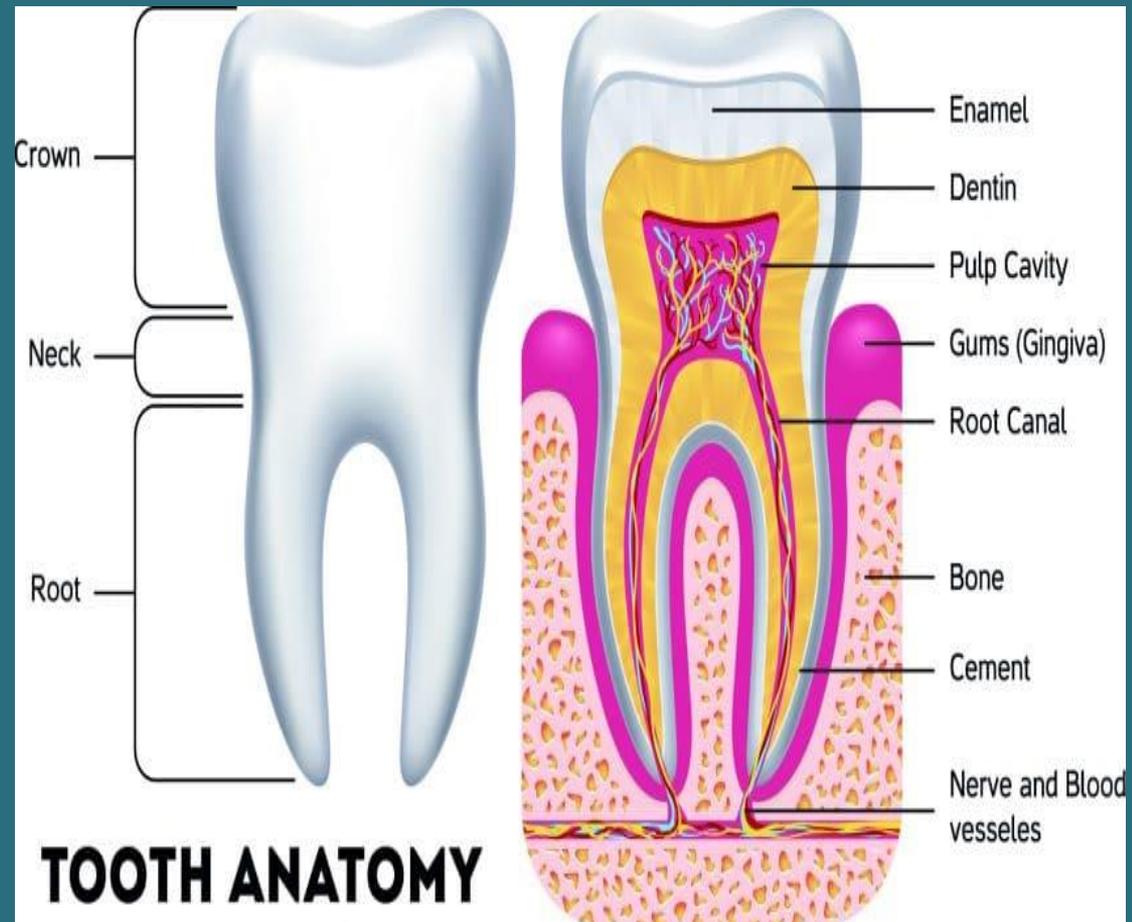
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Tooth Anatomy

Each tooth consists of three anatomical parts; **The crown , root(s) and neck.**



I- Crown

The crown terminates either with:

Horizontal end termed the **incisal ridge** as in incisors.

Tapered sharply pointed end at the tip of the **cusp** as in canines, premolars and molars.

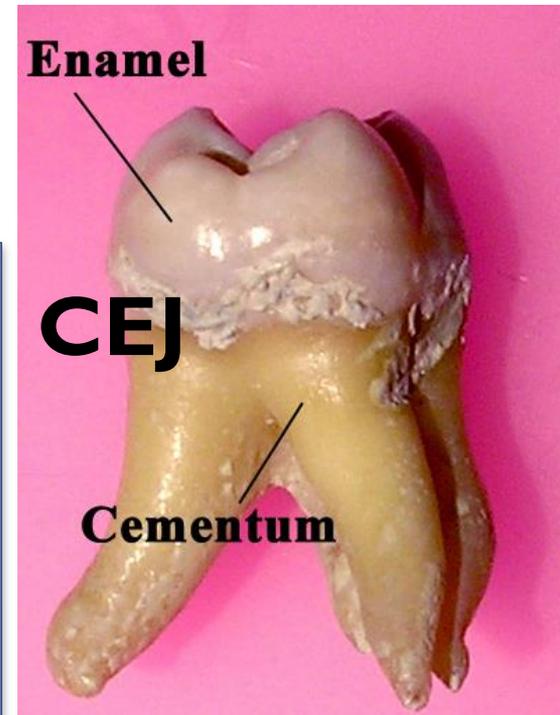


Anatomical crown

It is that part of the tooth covered by enamel .

It remains mostly constant throughout the life span of the tooth .

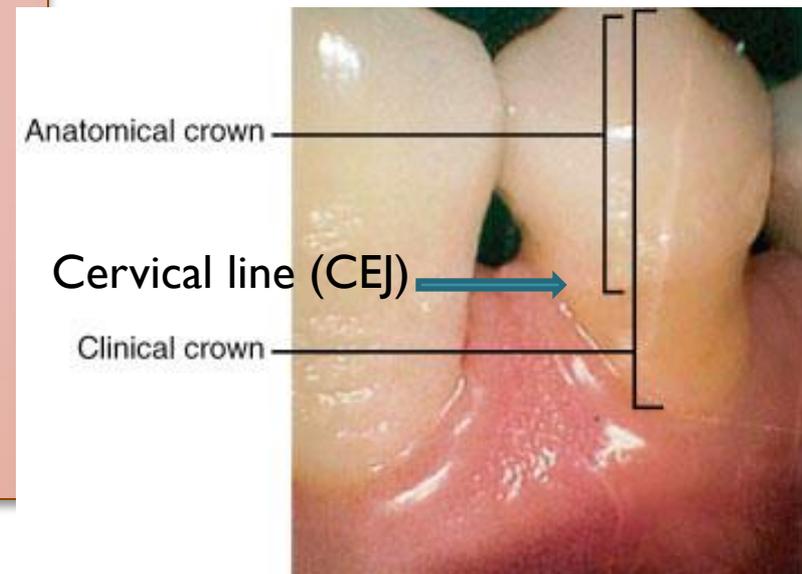
Attrition: is the physiological loss of hard dental structure (enamel) by mastication.



Clinical crown

It is the part of the anatomical crown which is visible in the oral cavity and not covered by gingiva.

It may be shorter, longer or equal to anatomical crown according to the level of gingiva.

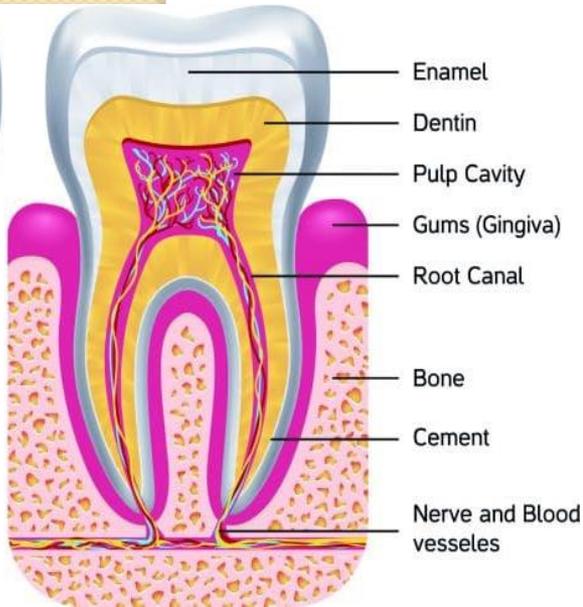


2- Root

It is that part of the tooth which is covered by cementum .

Teeth may have one or more roots. Teeth may be divided according to the number of roots into: **single rooted teeth** or **multiple rooted teeth**.

Multiple roots may be two roots (bi-furcation) or three roots(tri-furcation).



Single-rooted



Multi-rooted

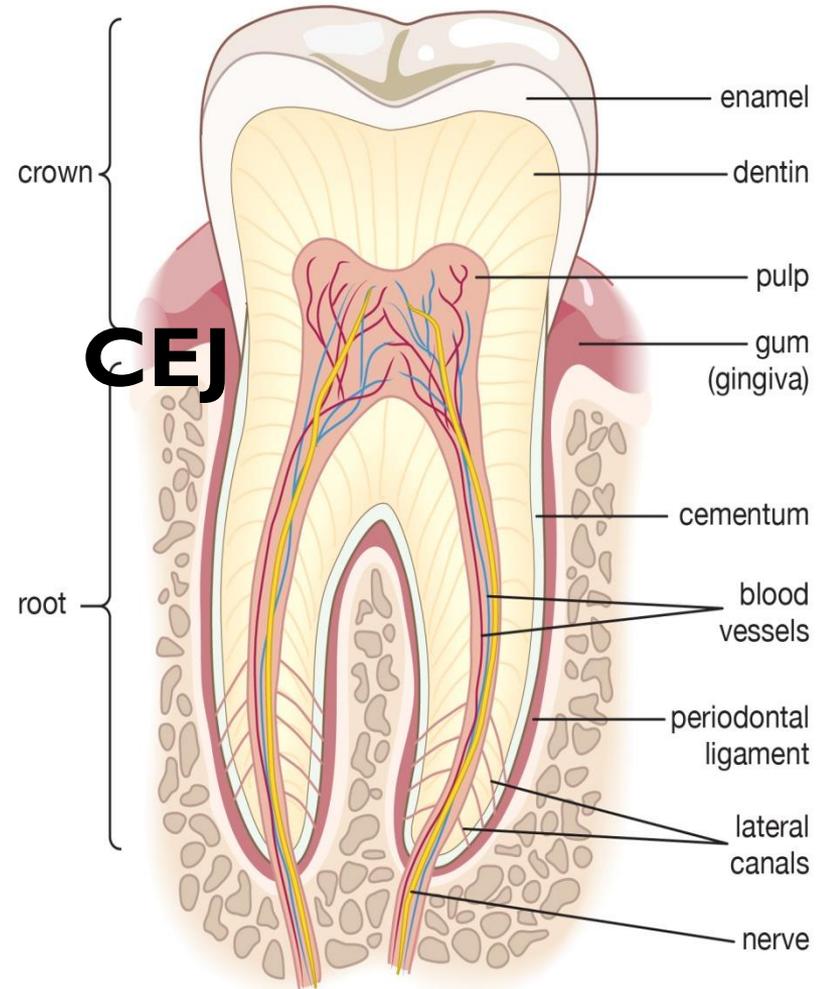


3-Neck

It is the junction between the anatomic crown and the anatomic root ,

it is named Cervical line.

It is located where the enamel and the cementum meet so it is also named as **cemento-enamel junction (CEJ).**



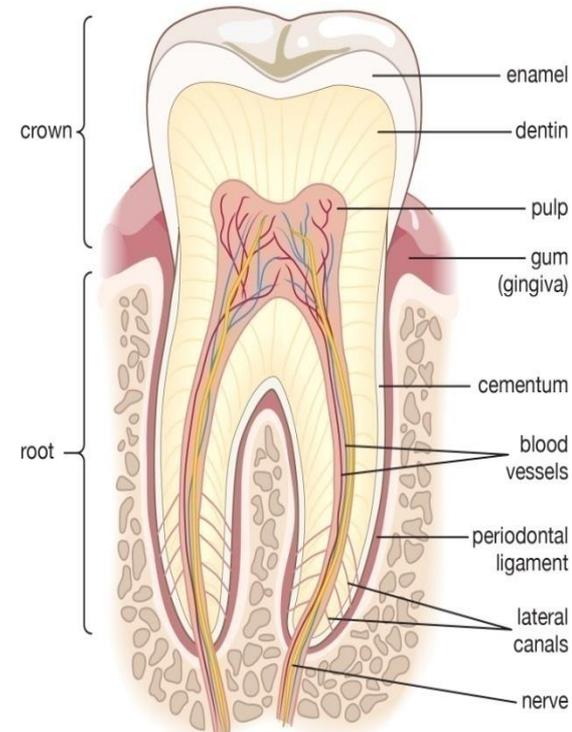
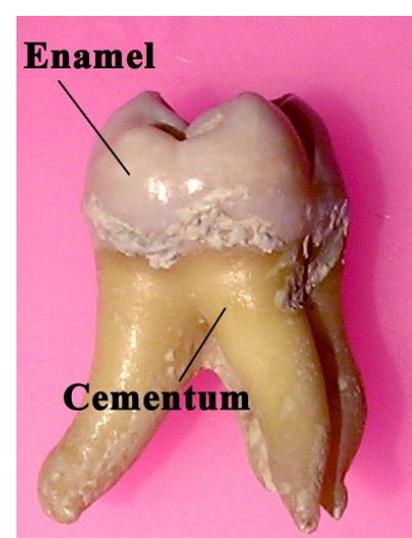
Structure of tooth

The main part of tooth is made up of dentin covered by enamel on the crown and Cementum on the root.

The central part of the tooth is formed of soft tissue called the pulp.

1-Enamel: it covers the anatomical crown . It is the hardest and the most mineralized tissue in the body which can resist masticatory force.

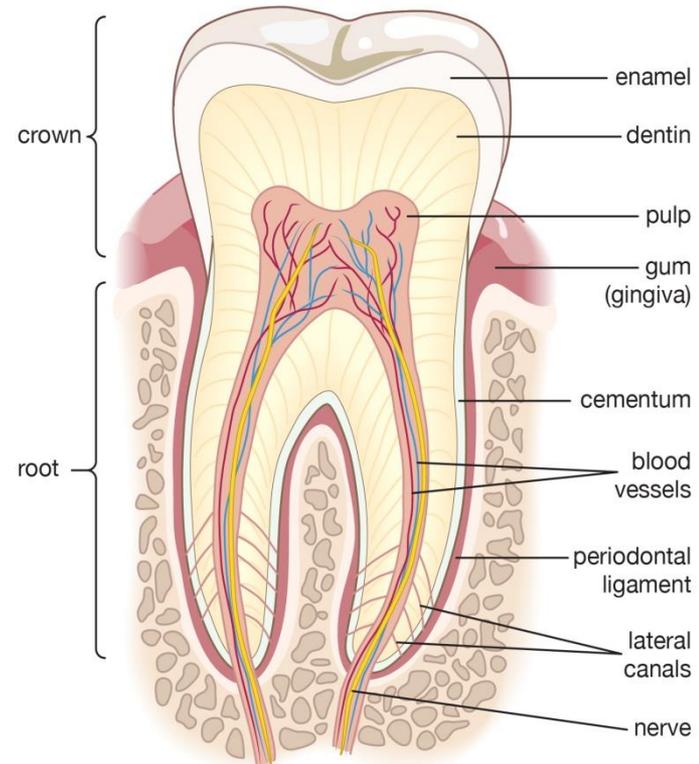
2-Cementum: it is a dull yellow hard tissue covering the anatomical root , it provides a medium of attachment the periodontal ligament.



Structure of tooth

3- Dentin: it is hard yellowish tissue which forms the main bulk of the tooth.

4- Pulp: it is the only soft tissue of the tooth . It supplies the tooth with blood and lymph vessels and nerves. It occupies the central part of the tooth which is called the pulp cavity.

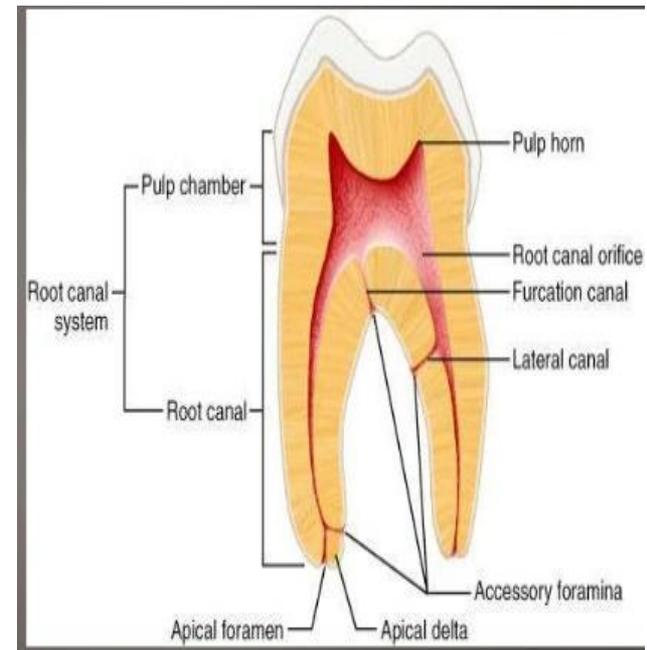
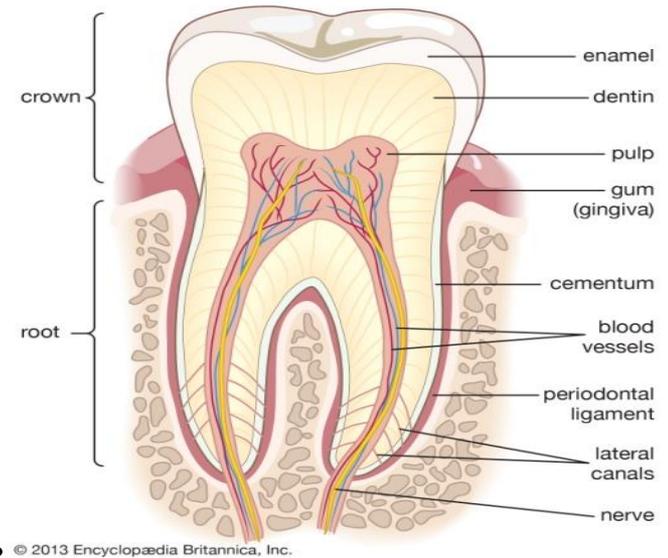


Anatomy of pulp cavity

A- the pulp chamber: which lies mostly in the center of the anatomical crown of the tooth. It is the enlarged portion of the pulp.

B-Root canal: it is located in the root, ends at the apex of the root by an apical foramen.

Apical foramen transmits the neurovascular and lymphatic bundles to enter the pulp tissue.

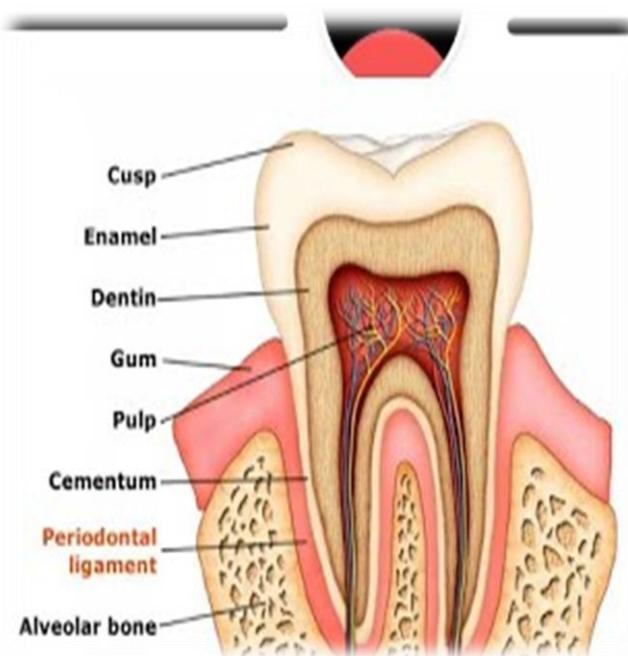
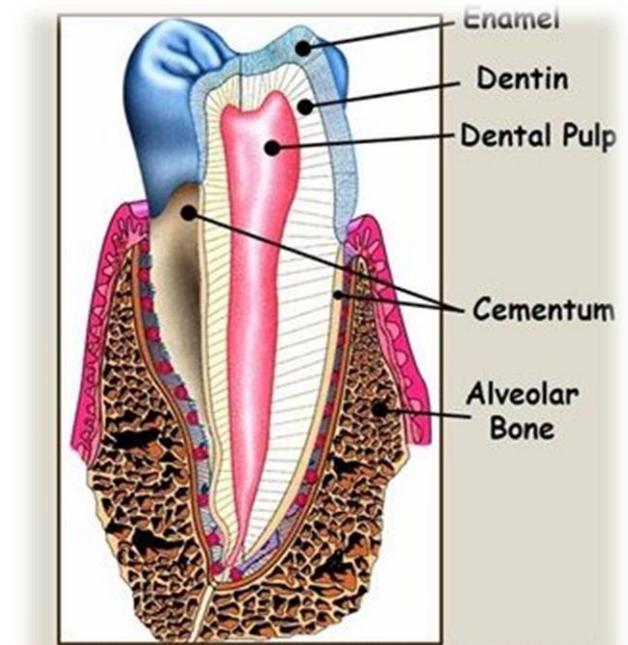


Terminology

Alveolar process: it is that portion of the jaw which surrounds and supports the teeth.

The root is firmly attached to the socket by a ligament known as **the periodontal ligament**.

The alveolar process is covered by pale pink tissue called **gingiva** or **gum** which surrounds the necks of teeth.

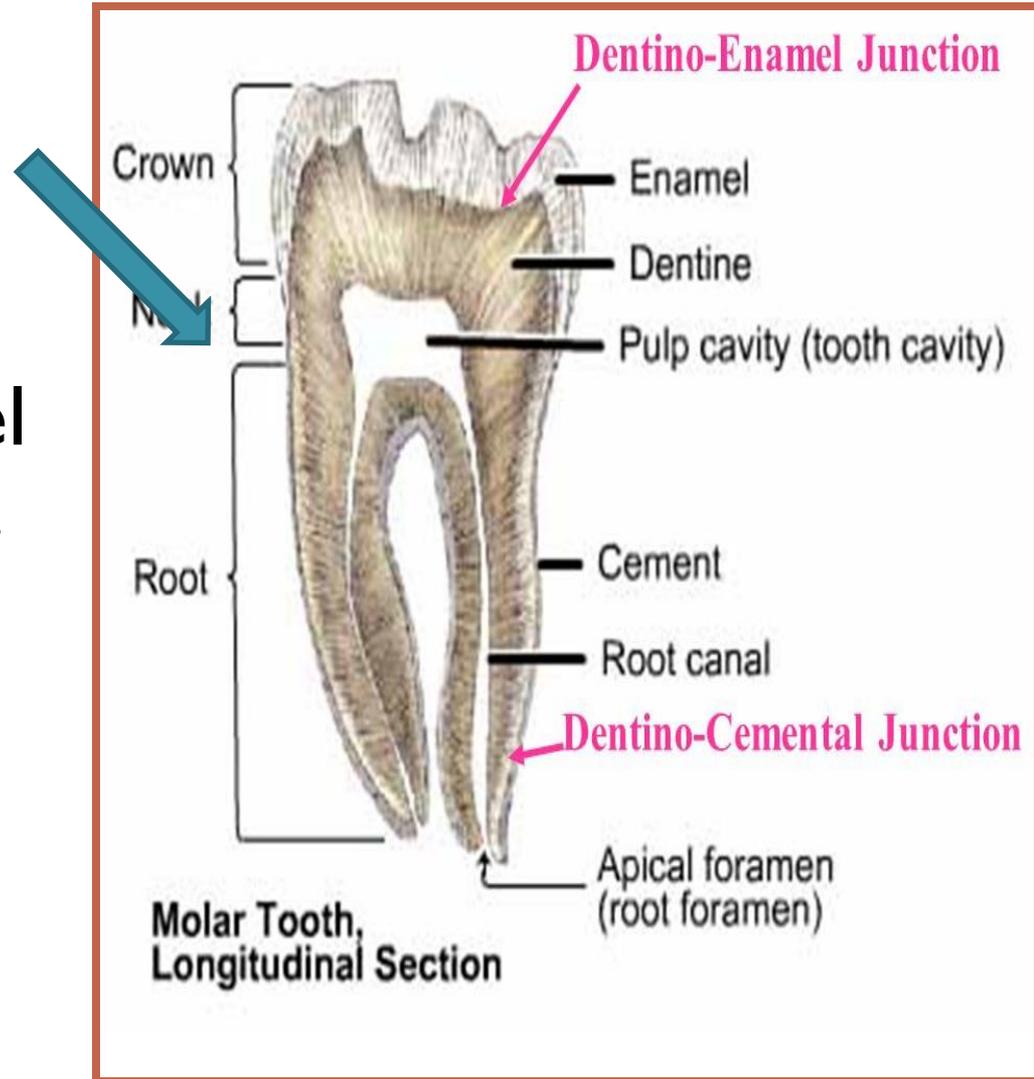


Junctions of the tooth tissues

1- Cemento- enamel junction : cervical line

2-Dentino- enamel junction : it is the junction between enamel and dentin in the crown.

3-Dentino-cemental junction: it is the junction between dentin and cementum in the root.



Function of teeth

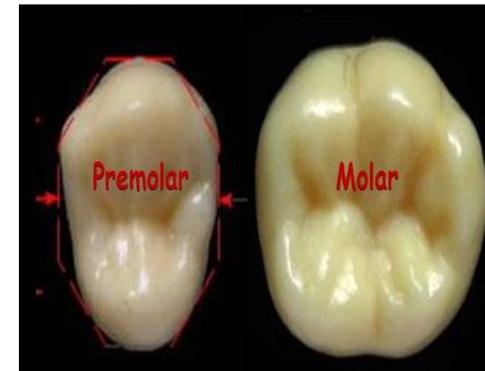
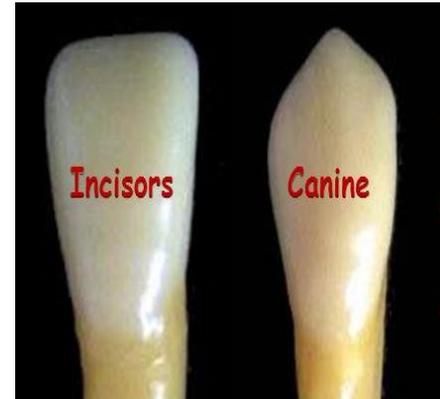
I- Mastication: this is the most important function of teeth.

Incisors : the form of the incisors is similar to a chisel. This form is suitable for cutting or incising food.

Canine: it is wedge shape suitable mainly for piercing or tearing food .

Premolars: they have intermediate form and location between canine and molars. So, they have the function of tearing and grinding of food.

Molars: they have wide surface with multiple elevations and thus they are suitable for grinding food.



Function of teeth

2- Appearance: well arranged clean teeth with proper alignment give nice appearance and support facial expressions .

3-Speech: teeth are important for clear pronunciation and for production of sounds.

4- Growth of jaws: teeth have a role in growth of jaws in some periods. If the child eats on one side the facial growth will be unilateral.



Surfaces of teeth

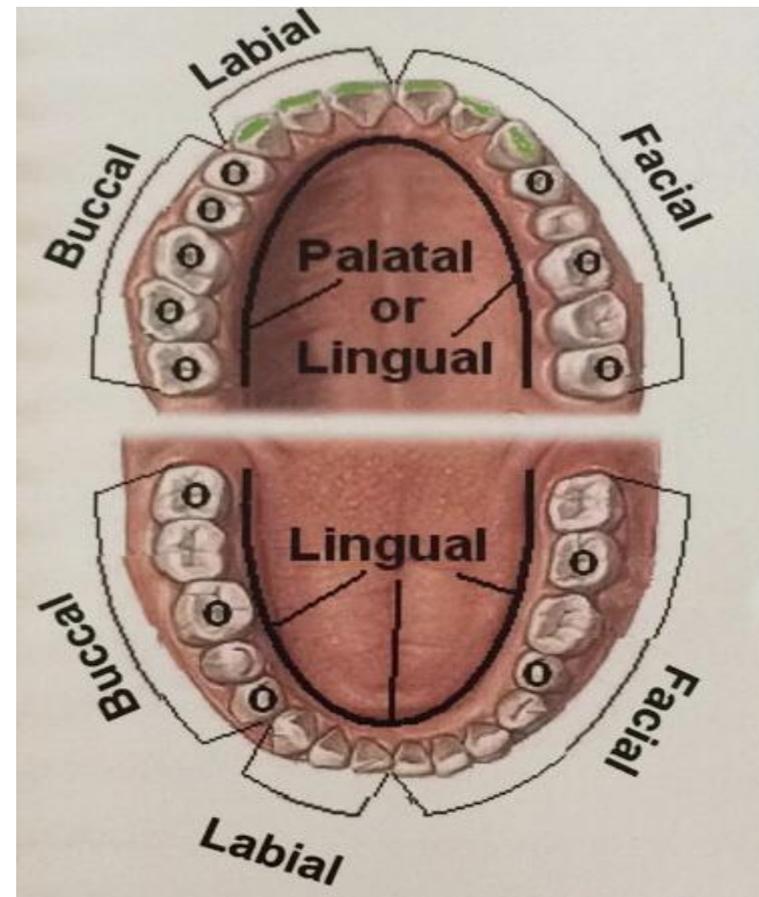
Each tooth have five surfaces:
Facial , lingual, mesial , distal and
masticatory (functioning surface).

I- Facial surface:

It is the surface of a tooth facing
the lips or cheeks , it can also
known as ;

A- Labial surface: the surface of
an anterior tooth facing the lips.

B- Buccal surface: the surface of
posterior teeth facing the
cheeks.

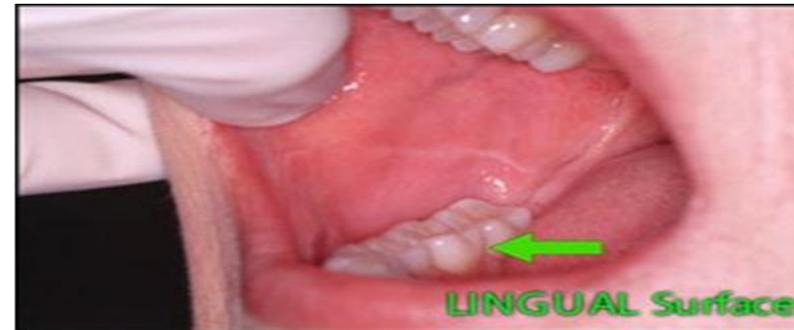
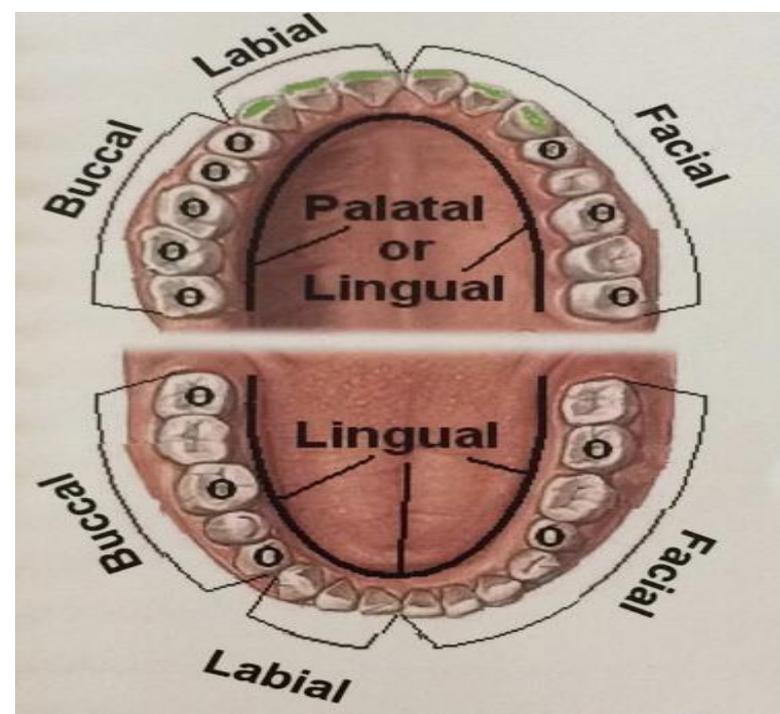


Surfaces of teeth

2- Lingual surface:

A- lingual surface: the surface of lower anterior and posterior teeth facing the tongue.

B- palatal surface : the surface of upper anterior and posterior teeth facing the palate.

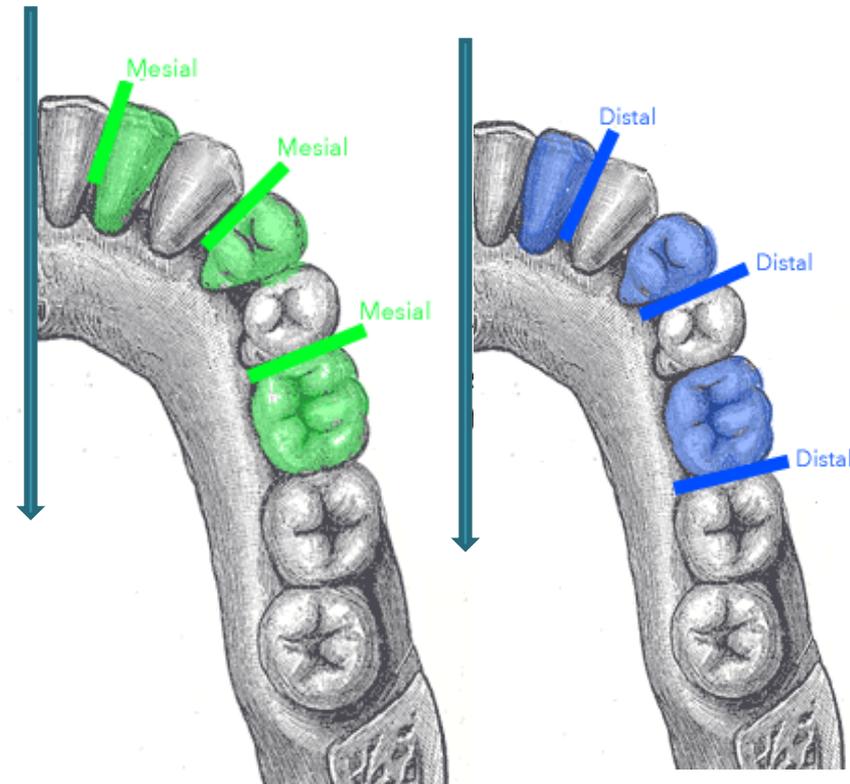
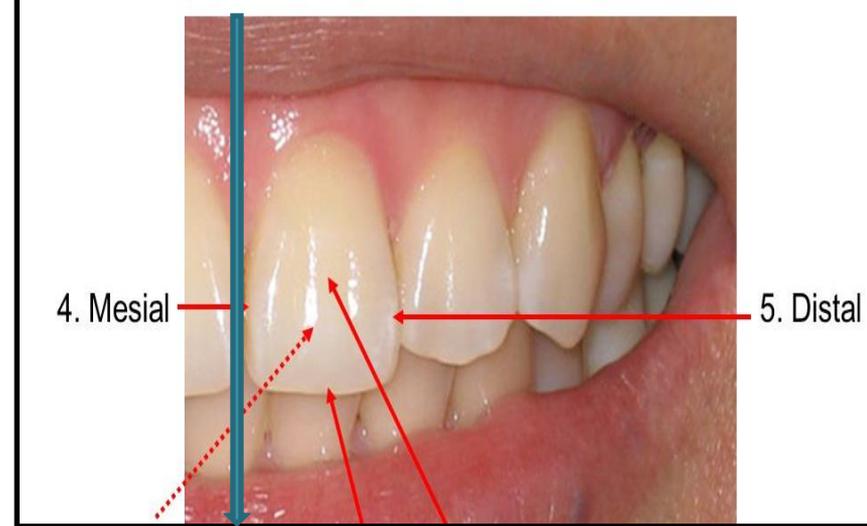


Surfaces of teeth

3- Mesial surface: it is the surface of tooth close to the midline.

4- Distal surface: it is the surface of the tooth away from the midline.

Together mesial and distal surfaces are called **proximal surfaces**, i.e. surfaces between adjacent teeth.

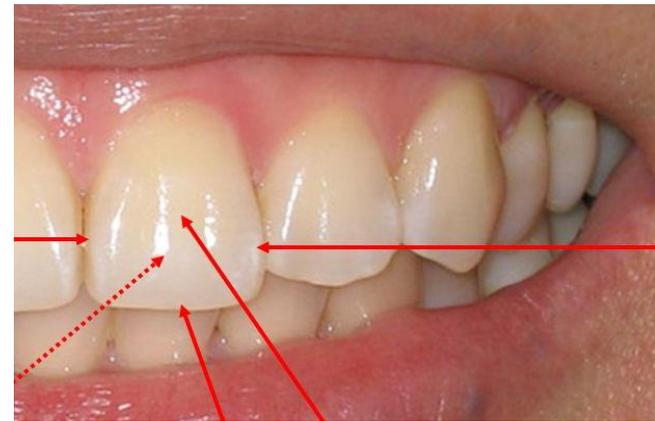


Surfaces of teeth

5- Masticatory surface:

A- incisal ridge or edge: it is the biting edge of anterior teeth.

B- Occlusal surface: it is the chewing surface of posterior teeth.





The End

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Tooth identification system

To identifying a specific tooth, the following items should be mentioned:

A- type of dentition (deciduous or permanent)

B- the arch (upper or lower).

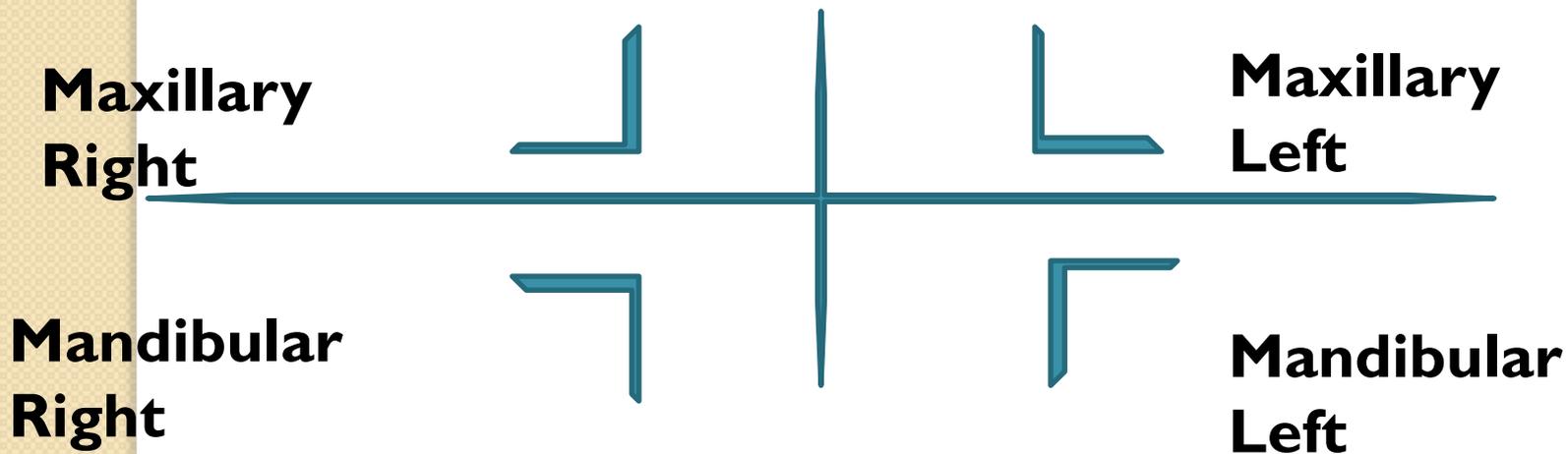
C- the quadrant (right or left)

D- the name of the tooth.

There are different systems for numbering teeth. The most popular are:

I - Palmer notation system:

This system utilizes simple brackets to represent the four quadrants of the dentition as if you facing the patient.



I- Palmer notation system:

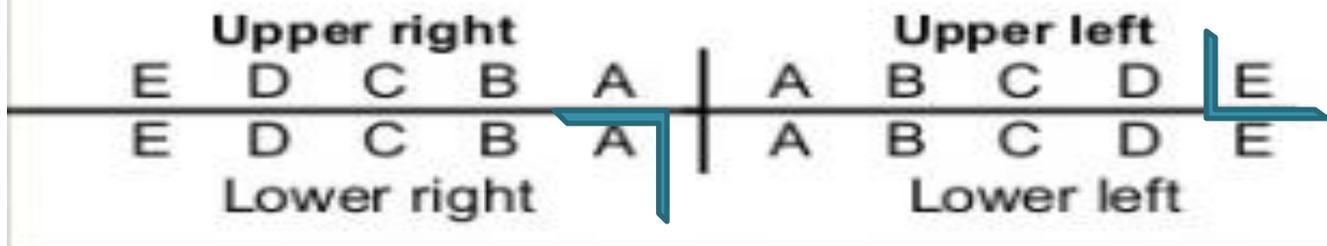
The deciduous teeth are lettered from A-E •
on each side from the midline as follows :

A- Central incisor B- Lateral incisor •
C- Canine D- First molar E- Second molar.

Examples:

A Deciduous lower right central incisor

E Deciduous upper left second molar



2- The international numbering system (two digit system).

Within this system the teeth are designed by two digits:

A- the first digit:

Located at the left side of the reader It indicates the quadrant .

For permanent dentition the quadrants are given the **numbers 1 to 4** starting from the upper right quadrant in a clockwise manner.

Permanent

Upper right – 1								Upper left – 2									
R	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	L
	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	
	Lower right – 4								Lower left – 3								

Deciduous

Upper right – 5					Upper left – 6						
R	55	54	53	52	51	61	62	63	64	65	L
	85	84	83	82	81	71	72	73	74	75	
	Lower right – 8					Lower left – 7					

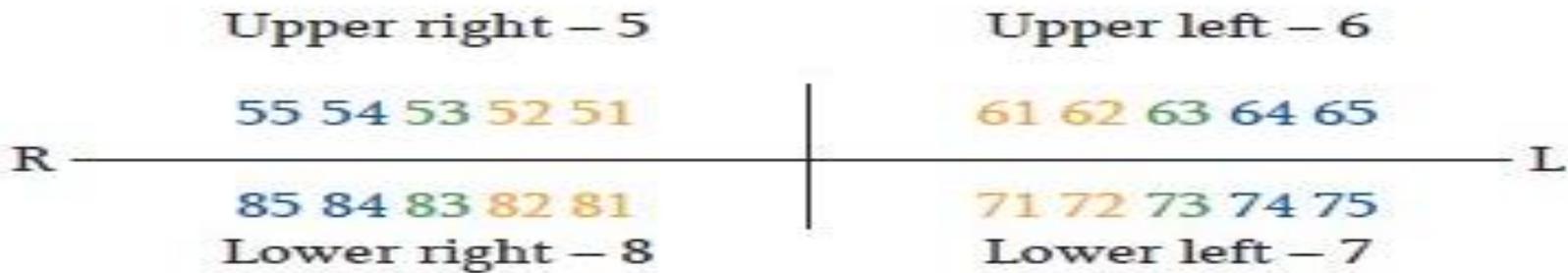
I – Incisor
 C – Canine
 P – Premolar
 M – Molar

Upper right – 1								
R	18	17	16	15	14	13	12	11
	48	47	46	45	44	43	42	41
	Lower right – 4							

2- The international numbering system (two digit system).

For deciduous dentition , digits from 5 to 8 is used.

Deciduous



Incisor

55 54 53 52 51

85 84 83 82 81

2- The international numbering system (two digit system).

B- the second digit:

Located at the right side of the number.

It indicated the number of the tooth in the quadrant.

For permanent teeth in each quadrant are the numbers from **1 to 8** while for deciduous teeth are from **1 to 5**.

This is designed from the midline in a distal direction.

The two digits should pronounced separately.

Example:

11 (one one) = upper right permanent central incisor .

Permanent	
Upper right – 1	Upper left – 2
18 17 16 15 14 13 12 11	21 22 23 24 25 26 27 28
R —————	————— L
48 47 46 45 44 43 42 41	31 32 33 34 35 36 37 38
Lower right – 4	Lower left – 3
Deciduous	
Upper right – 5	Upper left – 6
55 54 53 52 51	61 62 63 64 65
R —————	————— L
85 84 83 82 81	71 72 73 74 75
Lower right – 8	Lower left – 7

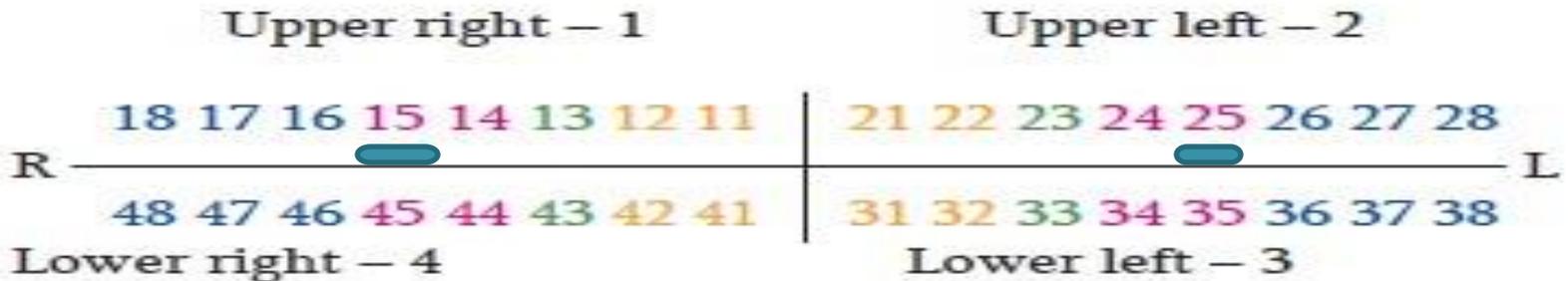
I – Incisor
 C – Canine
 P – Premolar
 M – Molar

Upper left – 2
21 22 23 24 25 26 27 28
————— L
31 32 33 34 35 36 37 38
Lower left – 3

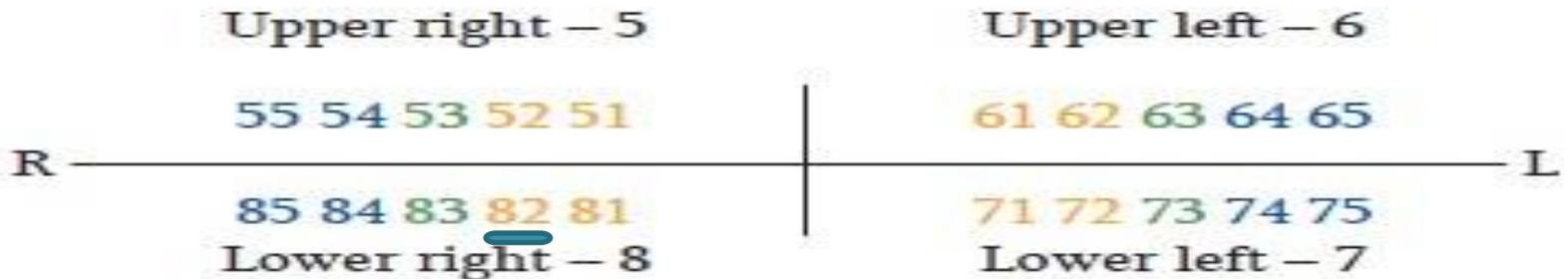
Upper left – 6
61 62 63 64 65
————— L
71 72 73 74 75
Lower left – 7

2- The international numbering system (two digit system).

Permanent



Deciduous



- I – Incisor
- C – Canine
- P – Premolar
- M – Molar

3-The universal numbering system (American numbering system)

The numbers in this system is always preceded by the **sign #** to designated that the system is used for universal system.

A- for permanent teeth:

Numbers from **1-32** are used starting from upper right third molar as **# 1** to upper left third molar as **#16** descending down to the lower left third molar as **# 17** to ends at lower right third molar as **# 32**

Permanent teeth (1-32)

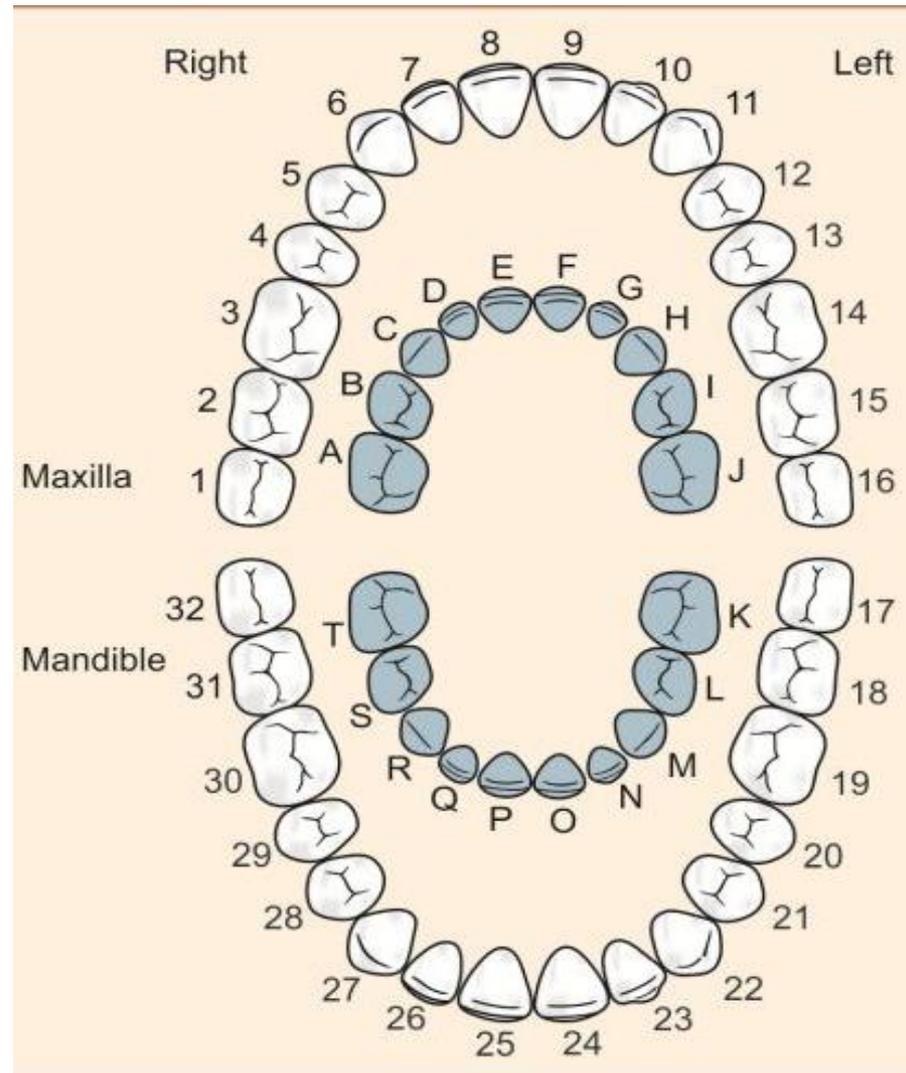
Permanent Teeth															
Upper Right								Upper Left							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Lower Right								Lower Left							

The universal numbering system (American numbering system)

B- for deciduous •
teeth:

Common system for deciduous teeth using alphabet from **A to T** instead of numbers along with the same sequence.

Example: lower right •
deciduous **canine** would
be **# R**





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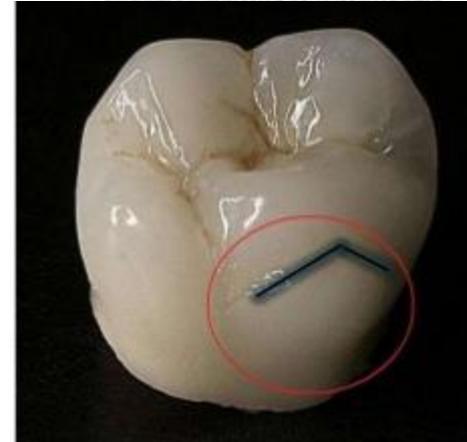
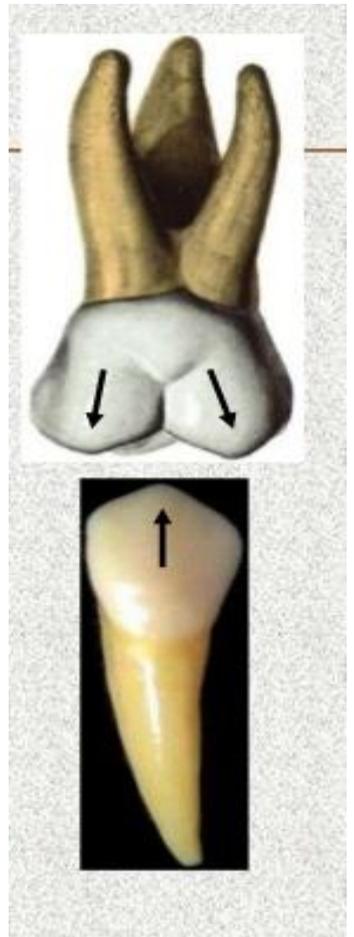


Anatomical landmarks

Cusp is an elevation or mound on the crown portion of a tooth making up a part of the occlusal surface of posterior teeth and incisal part of canines.

Tubercle is a smaller elevation on some portion of the crown produced by an extra formation of enamel.

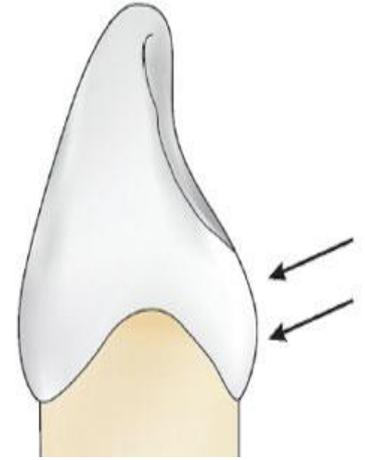
These are deviations from the typical form. Commonly found on **upper 6 and upper E**



A cingulum “girdle”: is the lingual lobe of an anterior tooth. It makes up the bulk of the cervical third of the lingual surface.

Its convexity mesiodistally resembles a girdle encircling the lingual surface at the cervical third

A ridge is any linear elevation on the surface of a tooth and is named according to its location (e.g., buccal ridge, incisal ridge, marginal ridge).



Marginal ridges are those rounded borders of the enamel that form the mesial and distal margins of the **occlusal** surfaces of **premolars** and **molars** and the **mesial** and **distal** margins of the lingual surfaces of the **incisors** and **canines**.

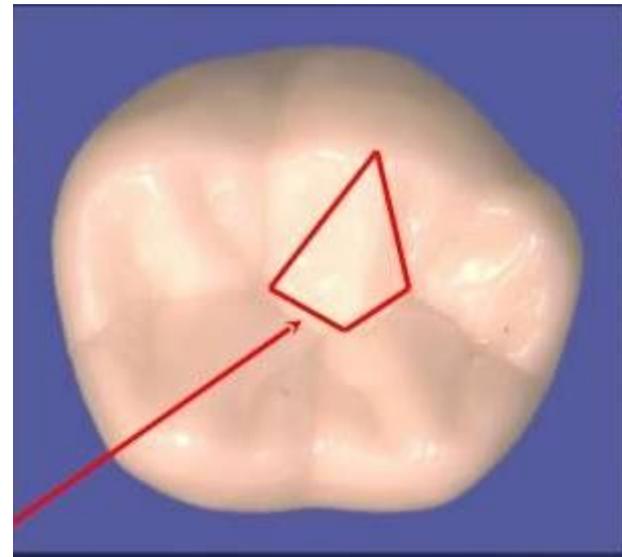


Triangular ridges: is a •

triangular shape descend from the tips of the cusps of **molars** and **premolars** toward the central part of the **occlusal** surfaces.

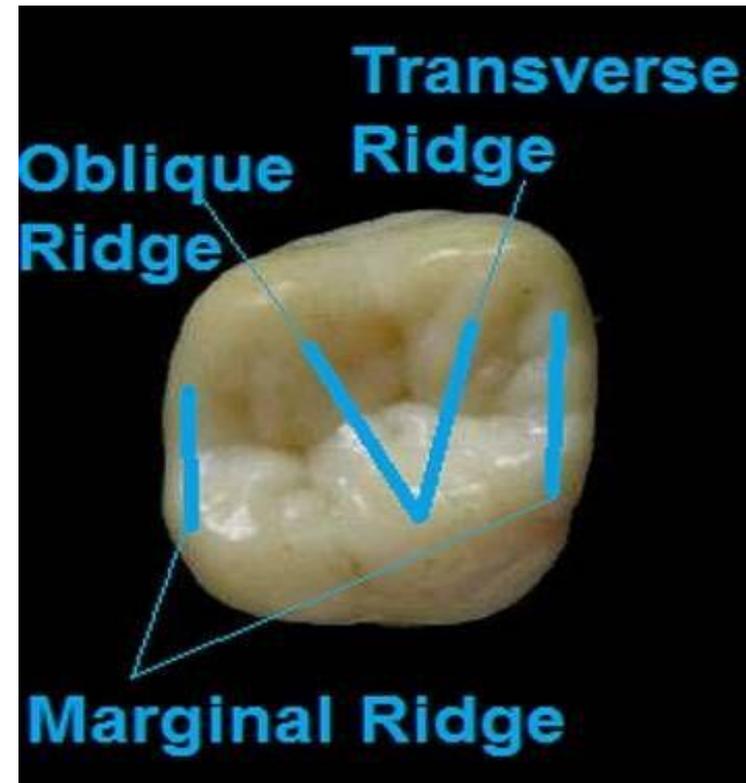
They are named after the cusps to •
which they belong,

for example, the triangular ridge •
of the **buccal** cusp of the maxillary first premolar.



A transverse ridge : is the union of two triangular ridges crossing transversely the surface of a posterior tooth.

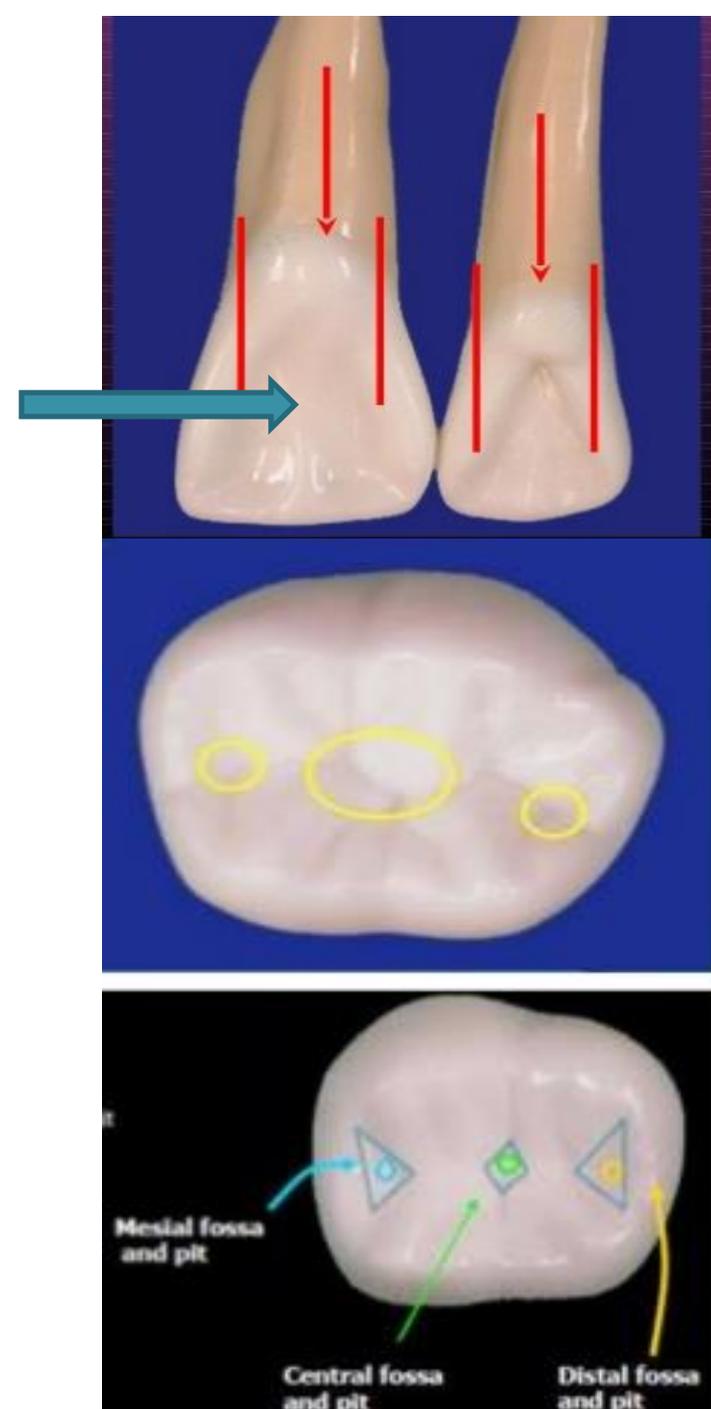
The oblique ridge : is a ridge crossing obliquely the occlusal surfaces of maxillary molars and formed by the union of the triangular ridge of the distobuccal cusp and the mesiolingual cusp



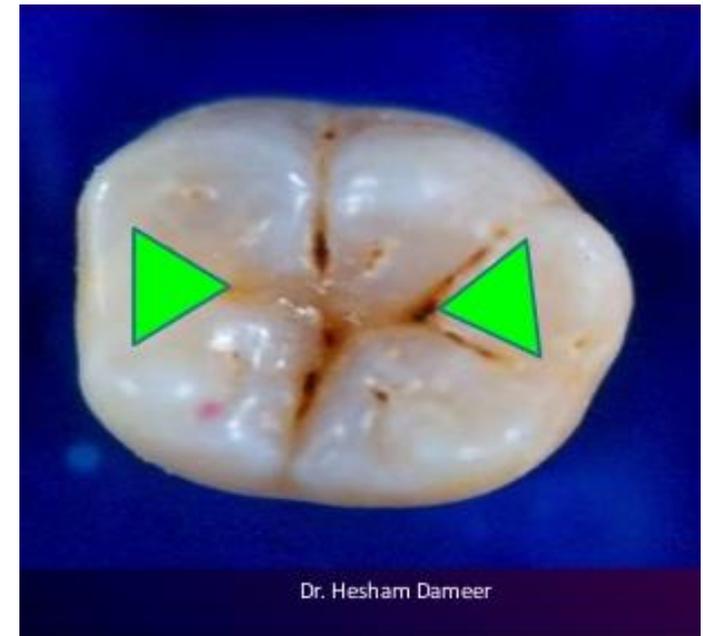
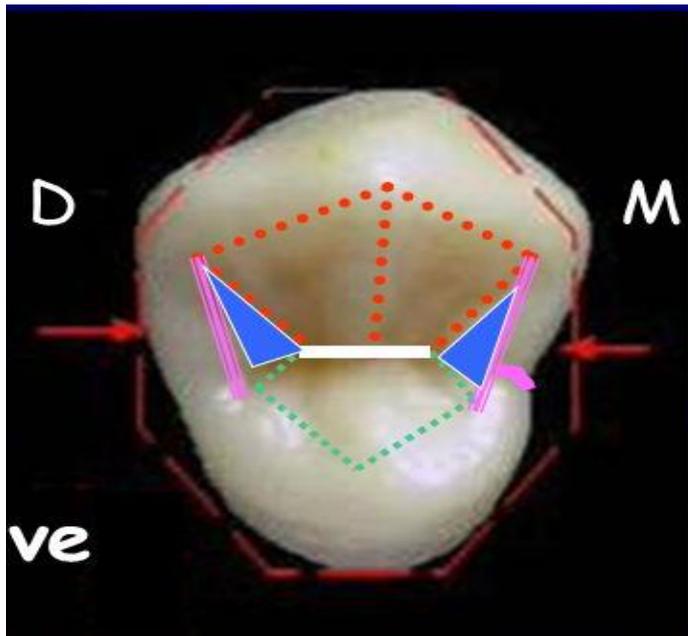
A fossa is an irregular •
depression or concavity.

Lingual fossae are on the
lingual surface of incisors

Central fossae are on the •
occlusal surface of molars.



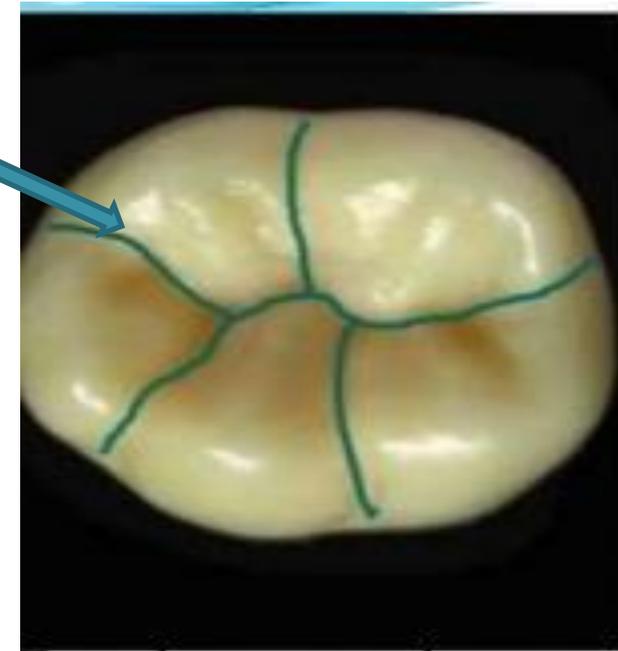
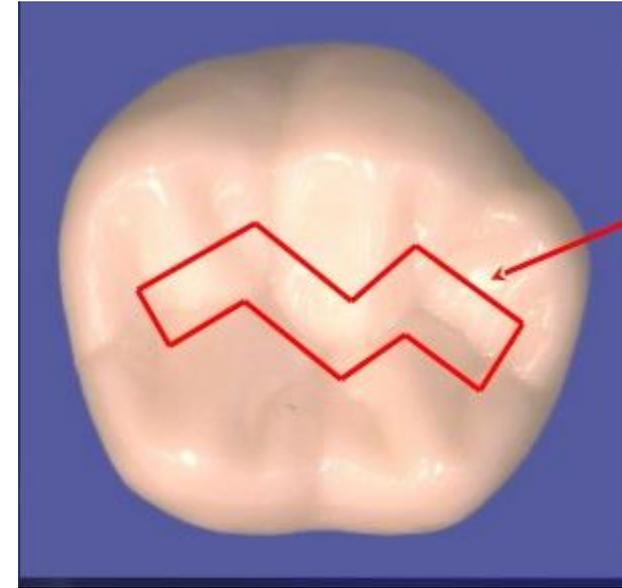
Triangular fossae are found on molars and premolars on the occlusal surfaces mesial or distal to marginal ridges .



A sulcus is a long depression or valley in the surface of a tooth between ridges and cusps, the inclines of which meet at an angle.

A sulcus has a **developmental groove** at the junction of its inclines.

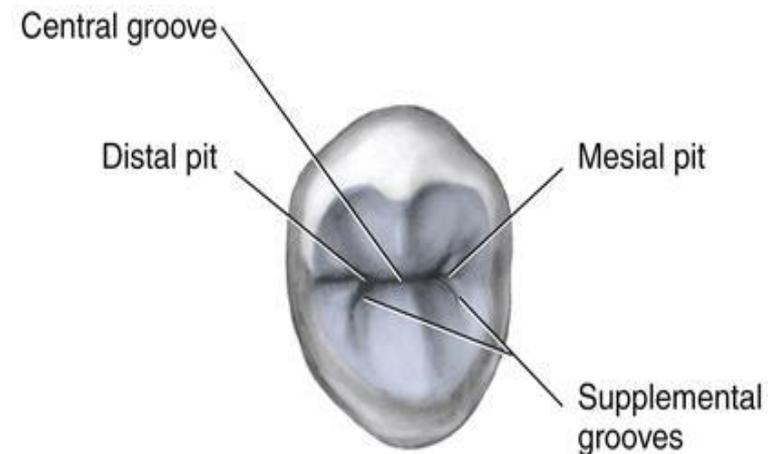
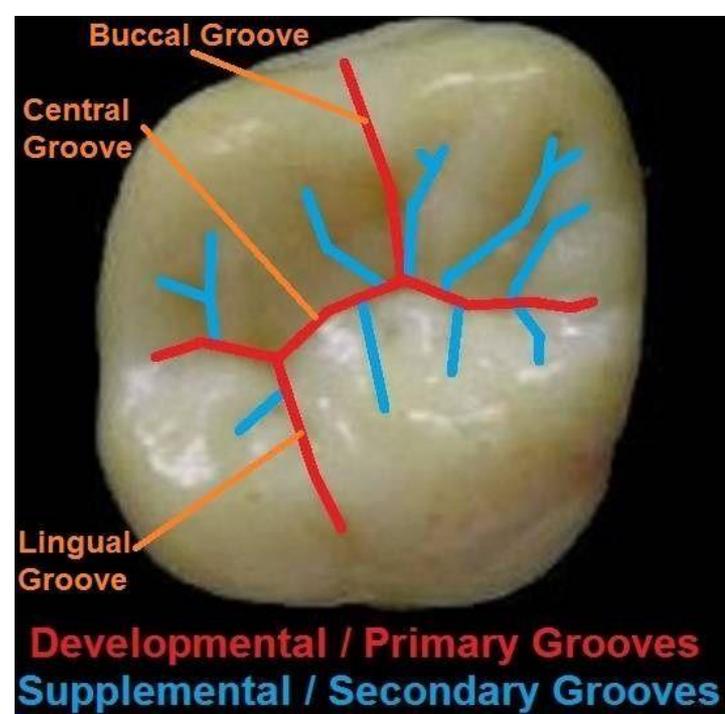
(The term **sulcus** should not be confused with the term **groove** .)



Developmental groove is a shallow groove or line between the primary parts of the crown or root.

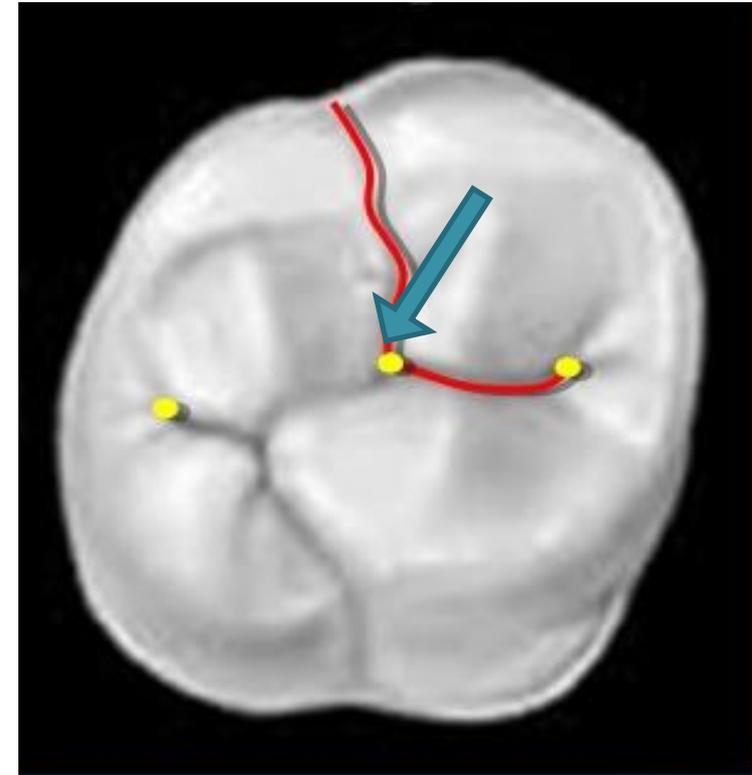
A supplemental groove, less distinct, is also a shallow linear depression on the surface of a tooth, but it is supplemental to a developmental groove and does not mark the junction of primary parts.

Buccal and **lingual** grooves are developmental grooves found on the buccal and lingual surfaces of posterior teeth



Pits are small pinpoint •
depressions located at the
junction of developmental
grooves or at terminals of
those grooves.

Central pit is a term
used to describe a landmark
in the central fossa of molars
where developmental grooves
join .



A lobe is one of the primary centers of formation in the development of the crown.

Cusps, cingulum and mamelons are examples of lobes.

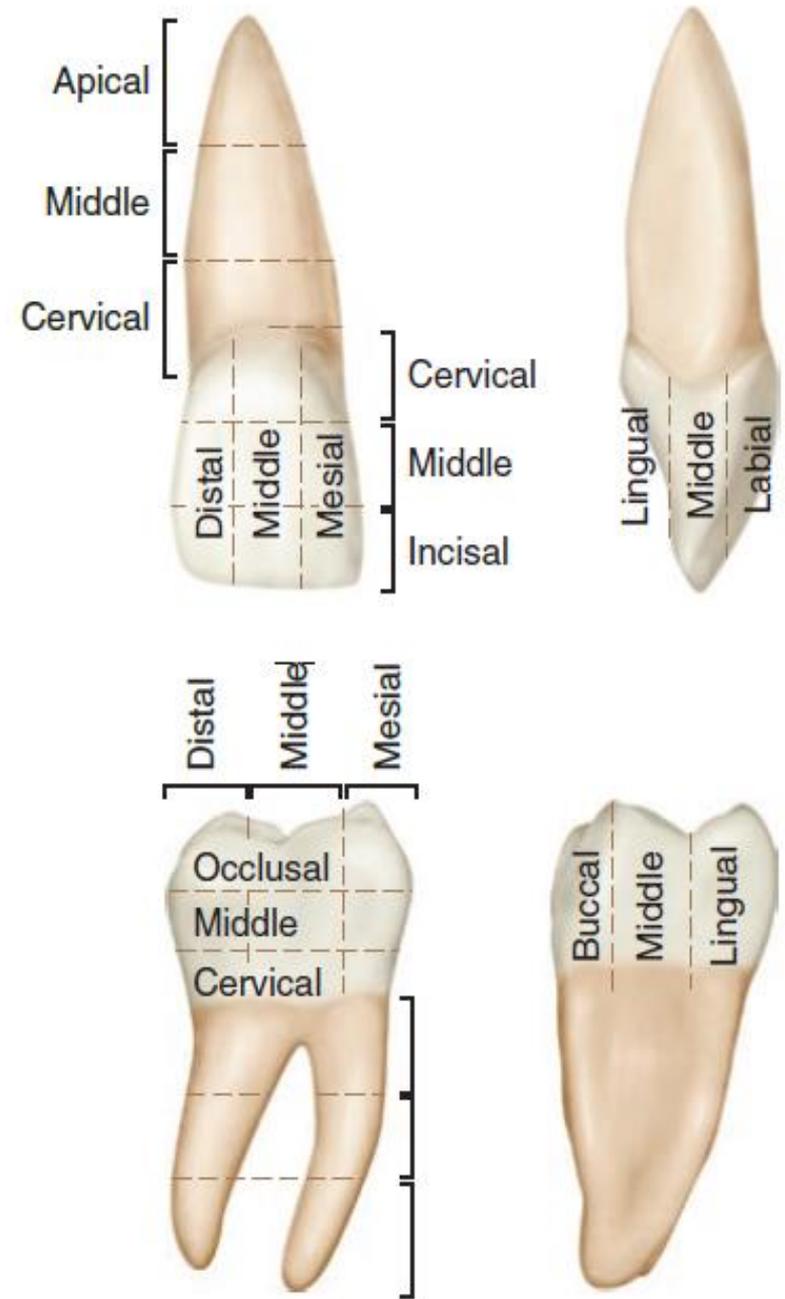
A mamelon is any one of the three rounded protuberances found on the incisal ridges of newly erupted incisor teeth



Division of teeth into Thirds, Line Angles, and Point Angles

When the surfaces of the crown and root portions are divided **into thirds**, these thirds are named according to **their location**.

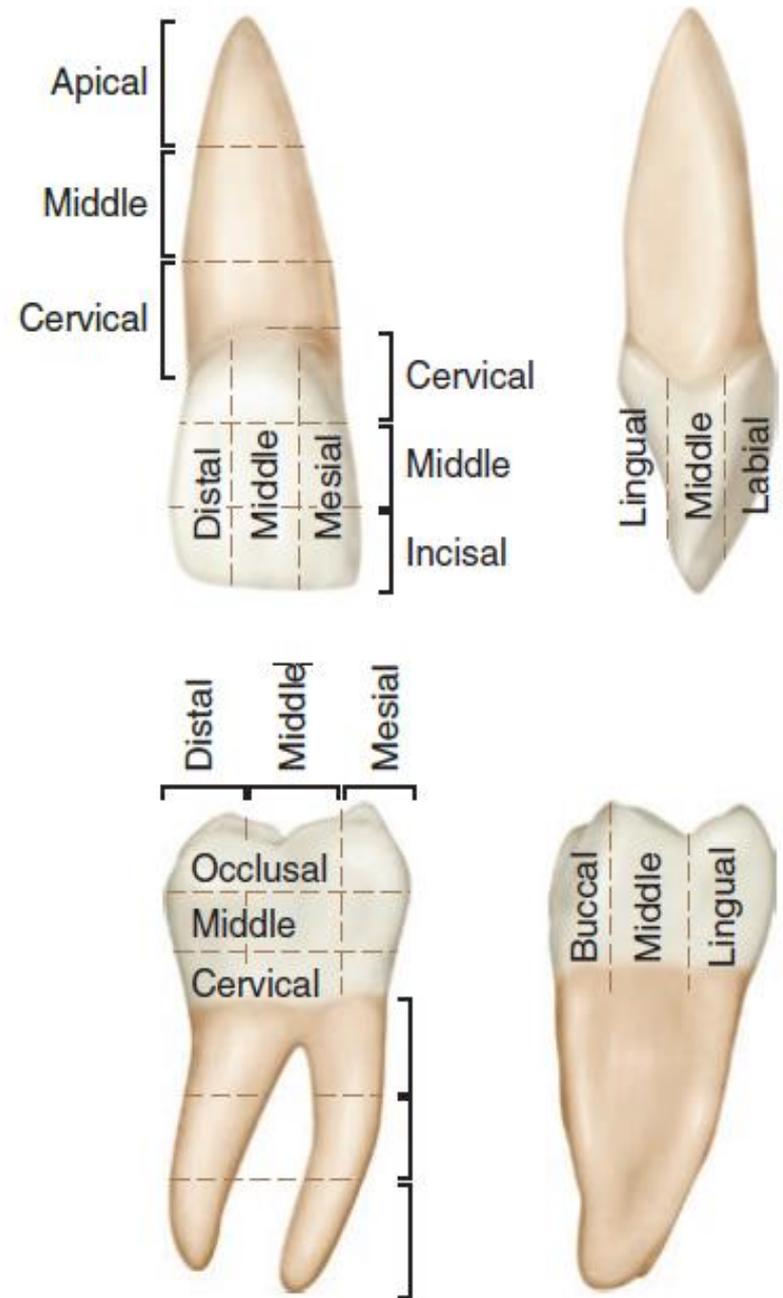
Looking at the tooth from the **labial or buccal** aspect, we see that the crown and root may be divided into thirds from the **incisal or occlusal** surface of the crown to the **apex** of the root



The crown is divided into •

- 1- **incisal** or **occlusal** third,
- 2- **middle** third
- 3- **cervical** third.

The root is divided into a **cervical** third, a **middle** third, and an **apical** third.



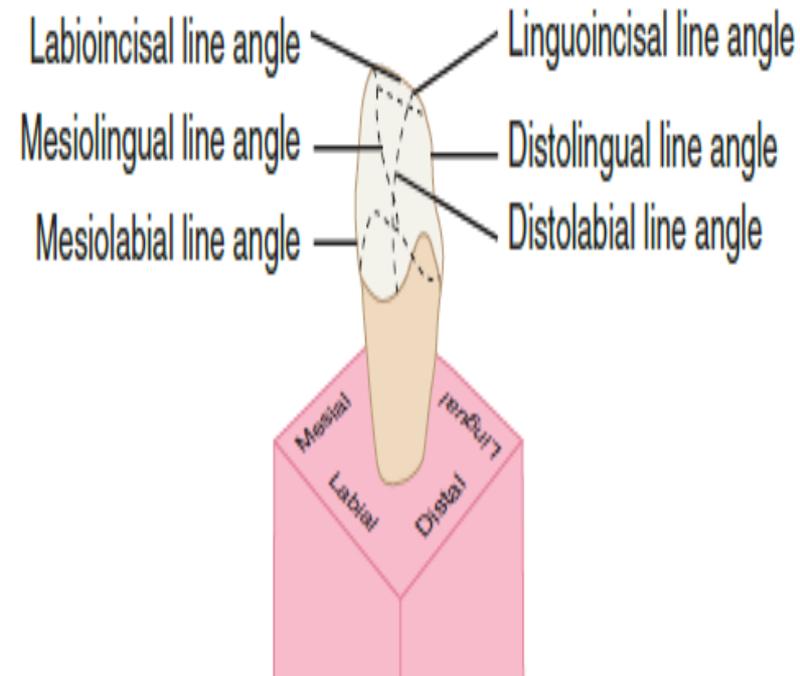
A line angle is formed by •
the junction of two
surfaces and

derives its name from the
combination of the two surfaces
that join.

For instance, on an anterior
tooth, the junction of the mesial
and labial surfaces is called the
mesiolabial line angle.

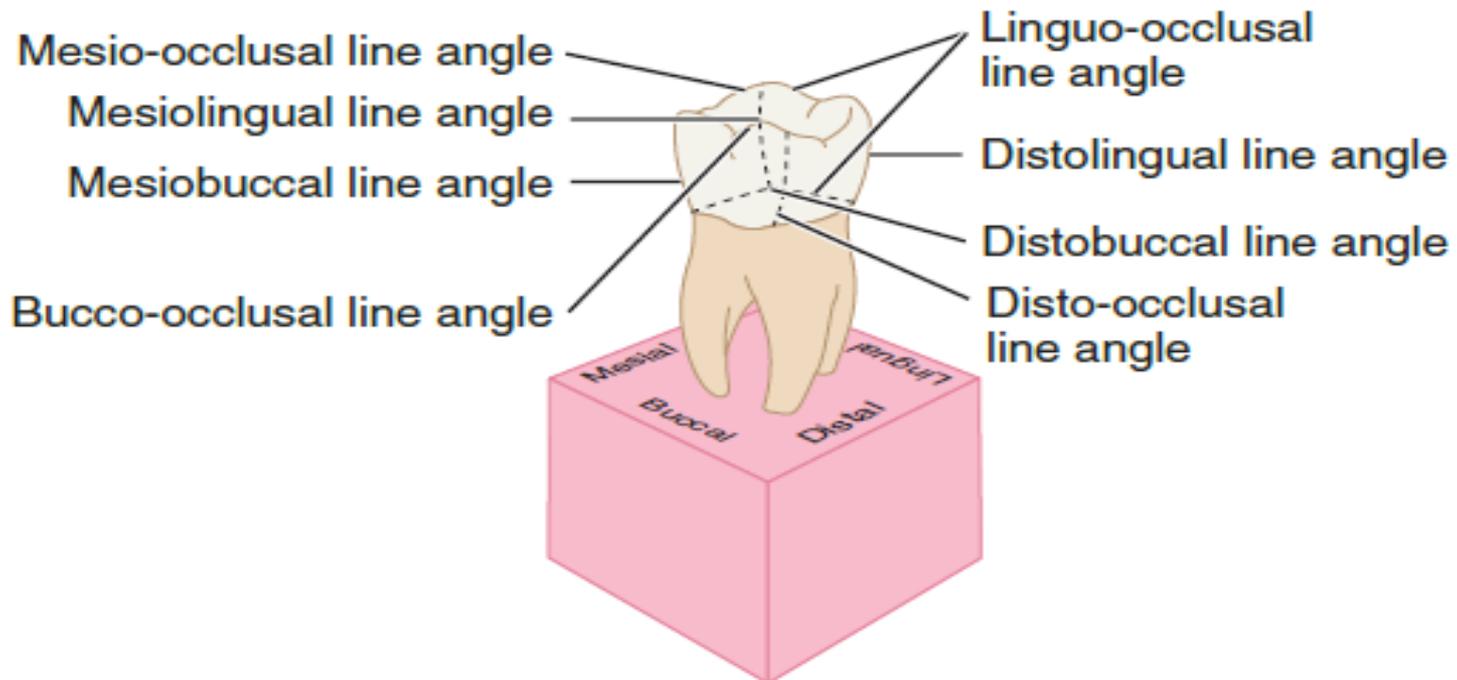
The line angles of the
anterior teeth are as
follows:

- | | |
|-----------------------|-----------|
| 1- mesiolabial | 2- |
| distolingual | |
| 3-distolabial | 4- |
| labioincisal | |
| 5-mesiolingual | 6- |



The *line angles* of the **posterior teeth** are •
as follows:

mesiobuccal distolingual bucco-occlusal
distobuccal mesio-occlusal linguo-occlusal
 mesiolingual disto-occlusal



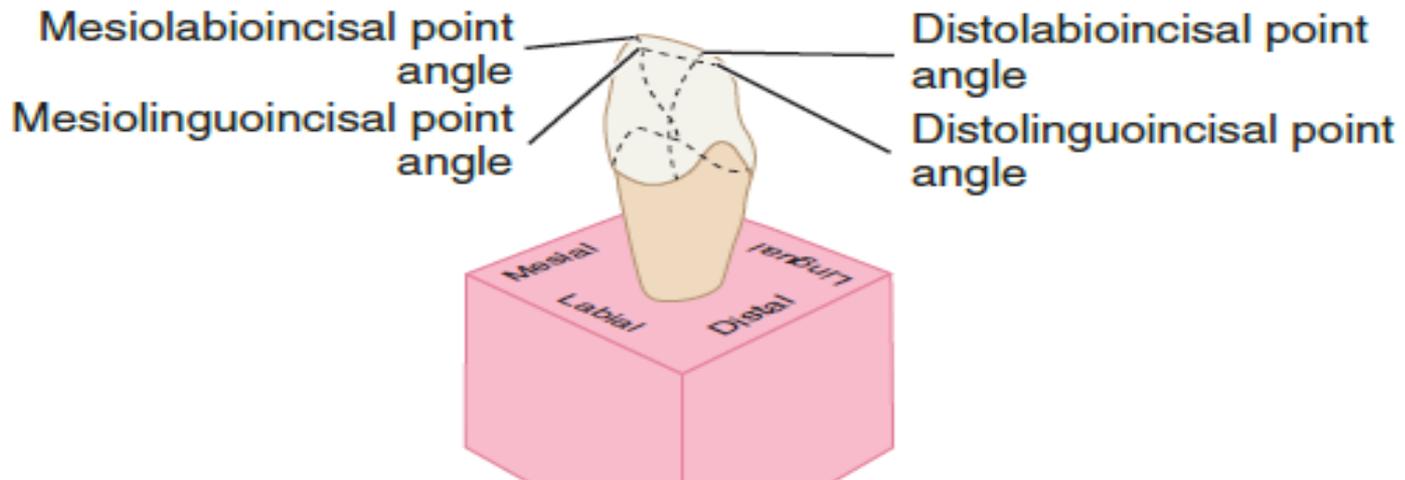
A point angle is formed by the junction of three surfaces.

The point angle also derives its name from the combination of the names of the three surfaces forming it.

For example, the junction of the mesial, buccal, and occlusal surfaces of a molar is called the mesiobucco-occlusal point angle.

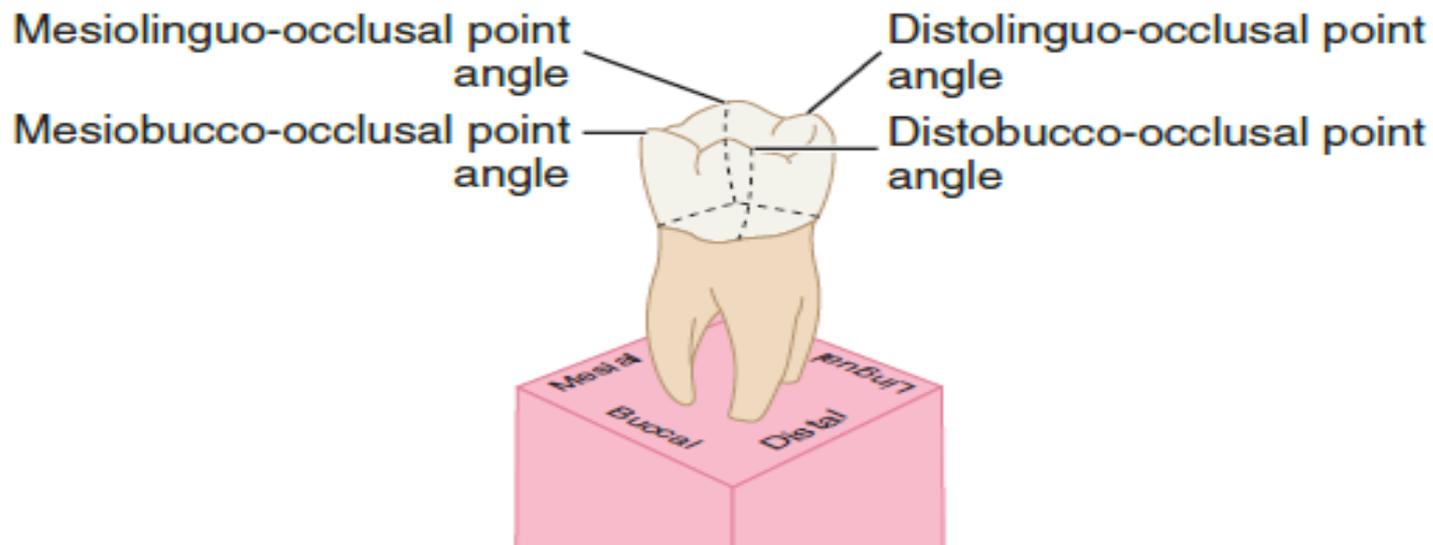
The *point angles of the anterior teeth are*

mesiolabioincisal
mesiolinguoincisal
distolabioincisal
distolinguoincisal



The *point angles* of the **posterior teeth** are •

- mesiobucco-occlusal**
- mesiolinguo-occlusal**
- distobucco-occlusal**
- distolinguo-occlusal**





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Permanent Incisors

Permanent incisors are eight in number ; four maxillary and four mandibular.

The major function of the incisors is to incise or cut the food during mastication process.

In addition, they play important roles in supporting the lips and maintaining a desirable esthetic appearance, also they are important in phonetics (speech).



Characteristic features of incisor's crown

1- Incisal ridge and edge.

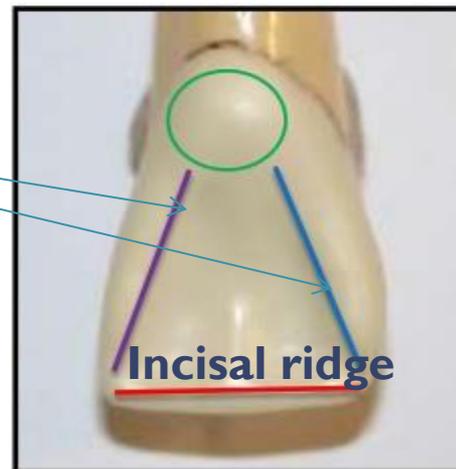
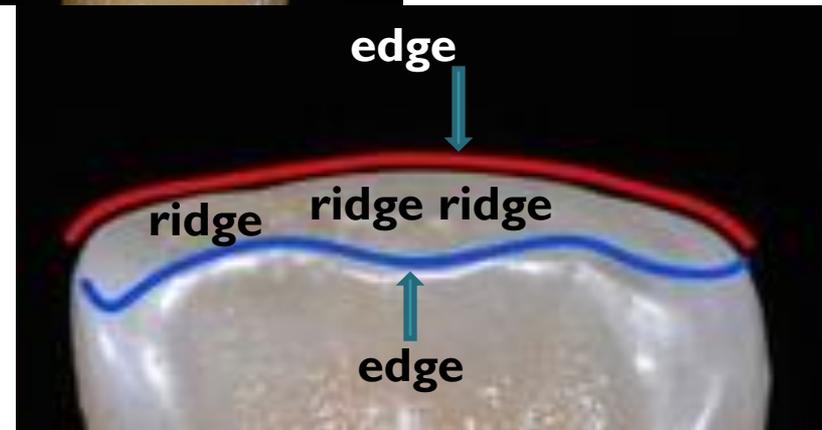
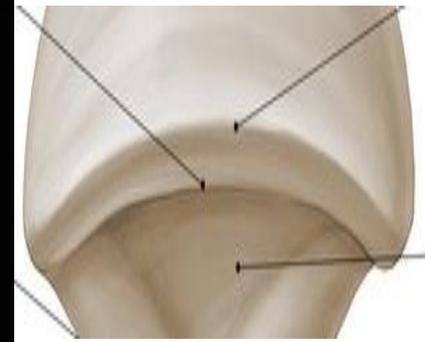
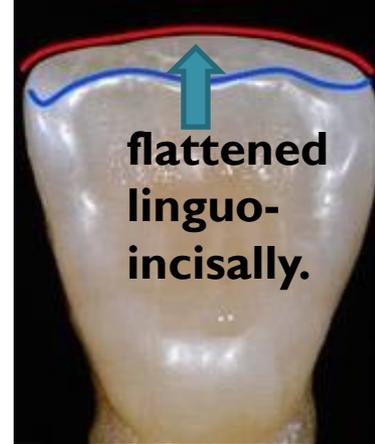
Incisal ridge is that portion of the crown which makes up the complete incisal portion. The term Incisal edge is used when an angle is formed by the occlusal wear which creates flattened surface linguo-incisally.

2- Presence of mamelons.

3- Marginal ridges are longitudinally positioned.

4- Lingual fossa.

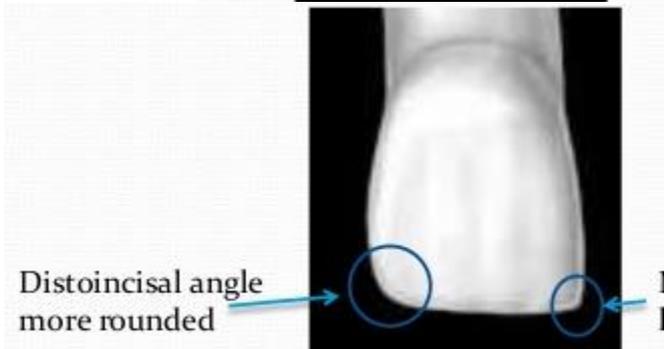
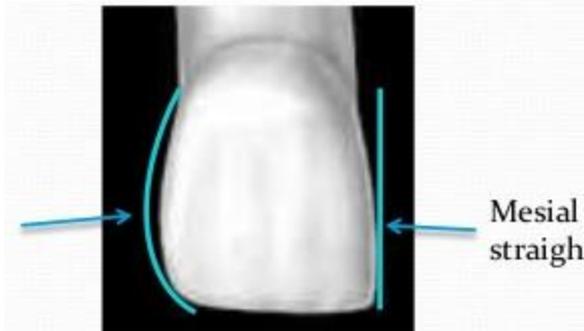
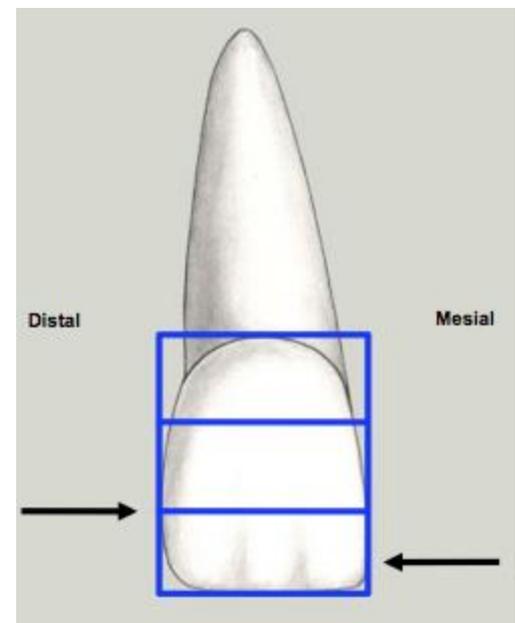
5- Cingulum.



Permanent Maxillary Central Incisor

Principal identifying features

- 1- It is the widest anterior tooth mesio-distally.
- 2- It has a square or rectangular appearance.
- 3- Straight mesial outline, and rounded distal outline.
- 4- Sharp mesio-incisal angle and rounded disto-incisal angle.



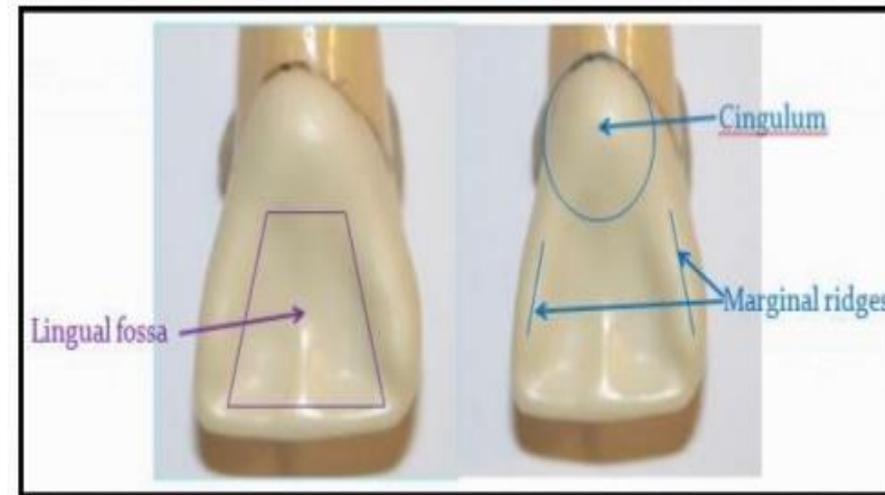
Permanent Maxillary Central Incisor

Principal identifying features

5- Mamelons on the incisal ridge (in newly erupted teeth).

6- Well marked marginal ridges, lingual fossa and well developed cingulum.

7- Single tapered root



Labial Aspect

1. The mesial outline is straight with a crest of curvature (contact area) near the **mesio-incisal angle**.

2. The distal outline is more convex than mesial outline with the crest of curvature (contact area) being at the junction between incisal and middle thirds.

3. The incisal outline in newly erupted teeth has elevations called "**Mamelons**". With age, they will wear off and straight incisal outline is seen.



Labial Aspect

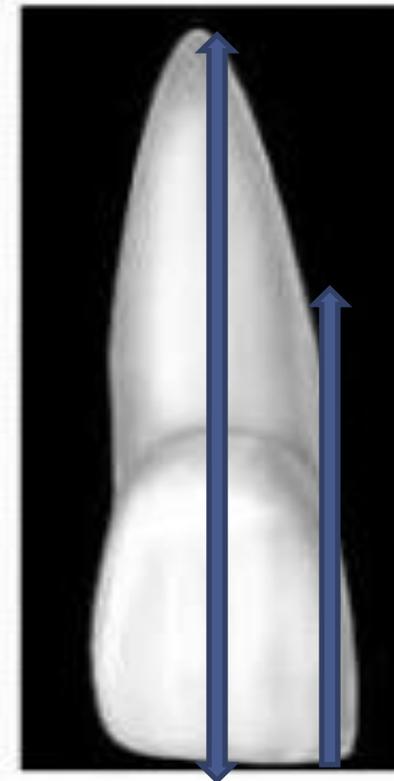
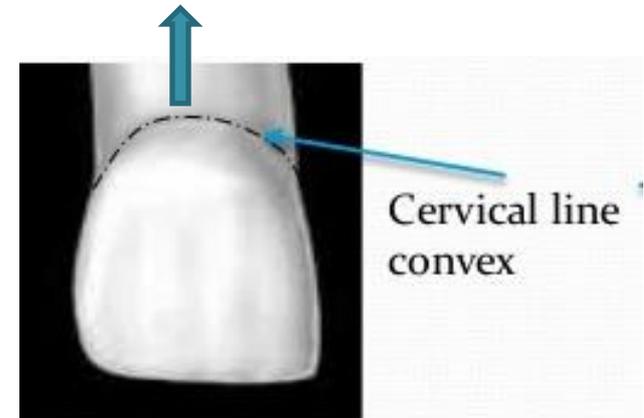
4. The cervical outline of the crown follows a semi-circular direction with the curvature directed towards the root.

5. The root is cone shaped with a blunt apex.

it is **2-3 mm** longer than the crown

6. A line drawn through the center of the root and crown tends to parallel the mesial outline of the crown

and root.



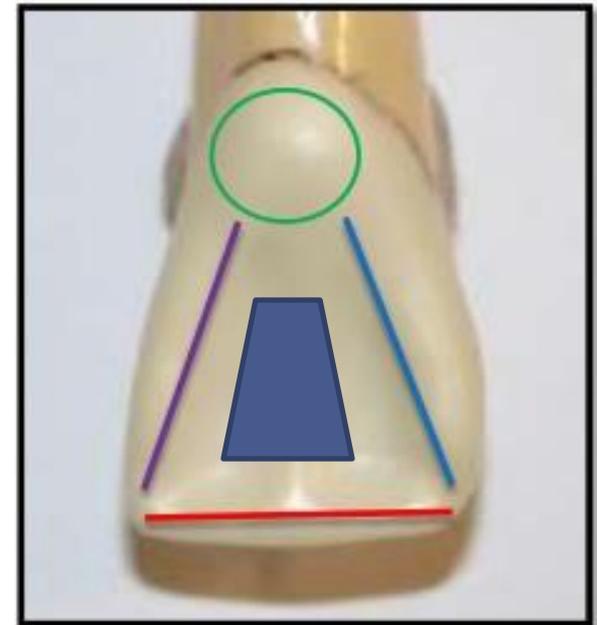
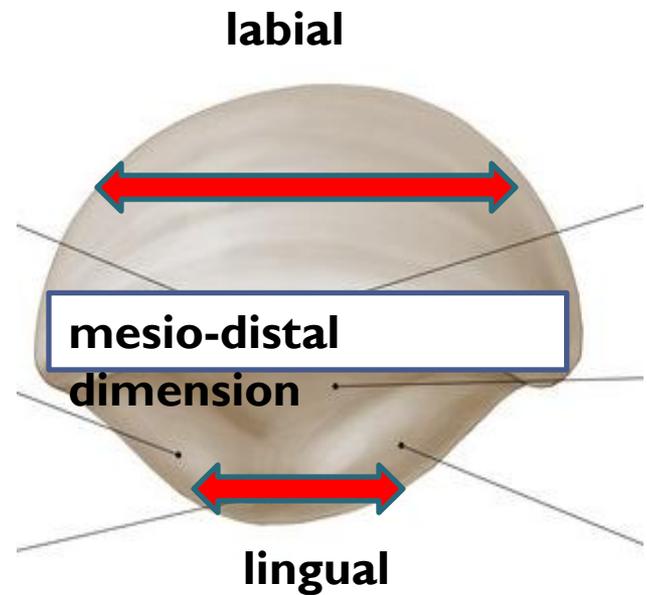
Lingual Aspect

1. The crown and root taper lingually, therefore, mesio-distal dimension of the lingual surface is narrower than that of the labial surface.

2. Below the cervical line, there is a smooth convexity called "**Cingulum**" which is confluent with **raised marginal ridges mesially** and **distally**.

3. Incisally, there is the lingual portion of **the incisal ridge**.

Between this ridge and the marginal ridges and the Cingulum, a shallow concavity called "**the lingual fossa**" is present (usually have developmental grooves).



Mesial Aspect

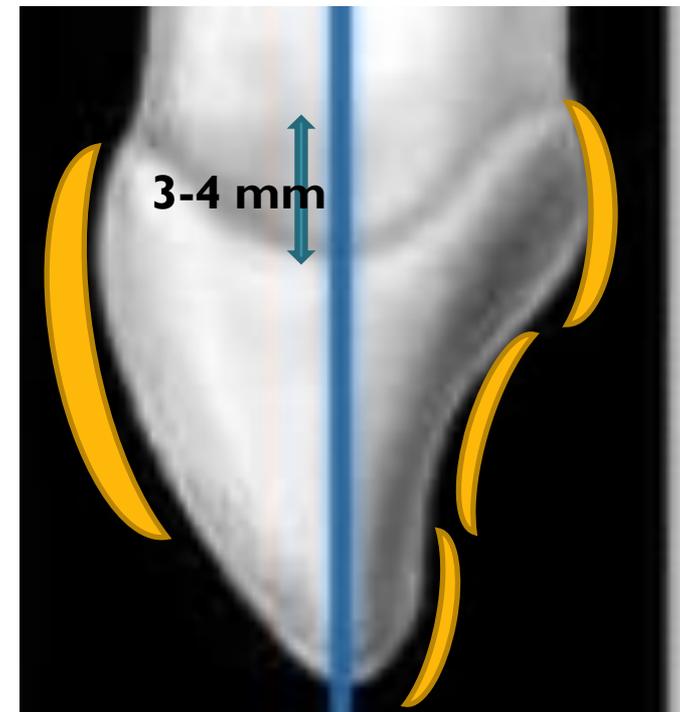
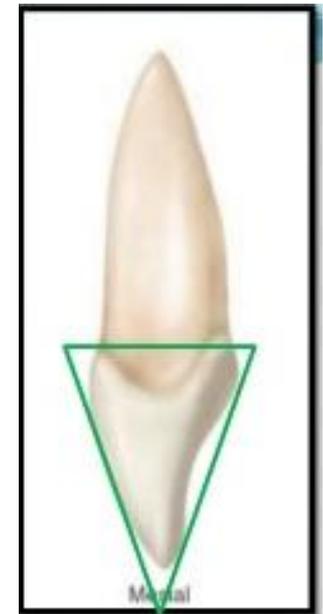
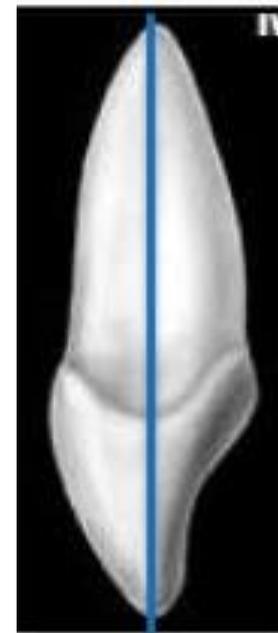
1. The crown is triangular in shape, with the base at the cervical part and the apex at the incisal ridge.

2. A line which bisects the crown will bisect the root.

3. The labial outline is slightly convex.

4. The lingual outline of the crown is convex at the cingulum, then becomes concave at the mesial marginal ridge, then slightly convex at the incisal ridge.

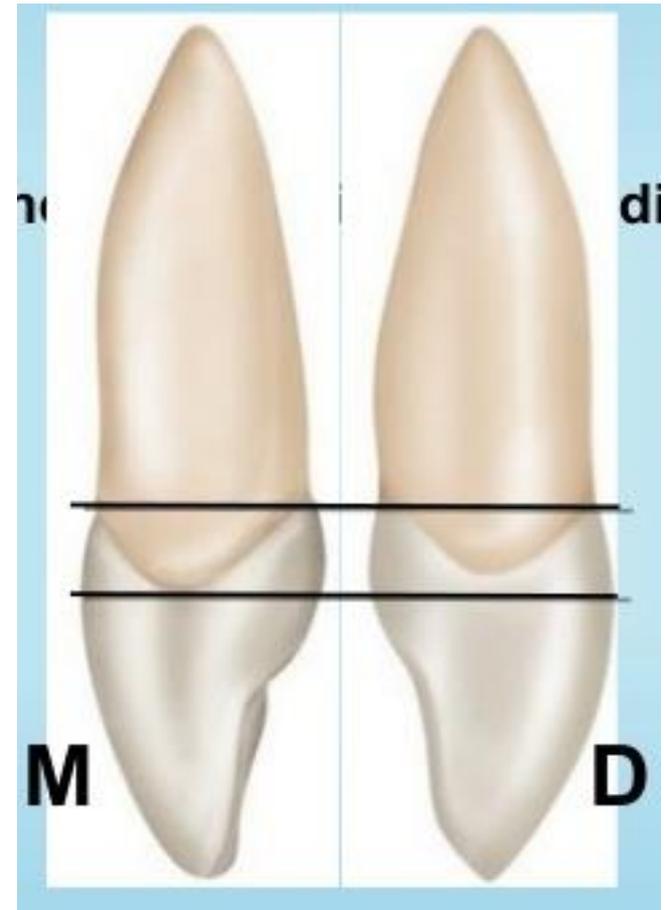
5. The cervical outline curves incisally more than any surface on any tooth about



Distal Aspect

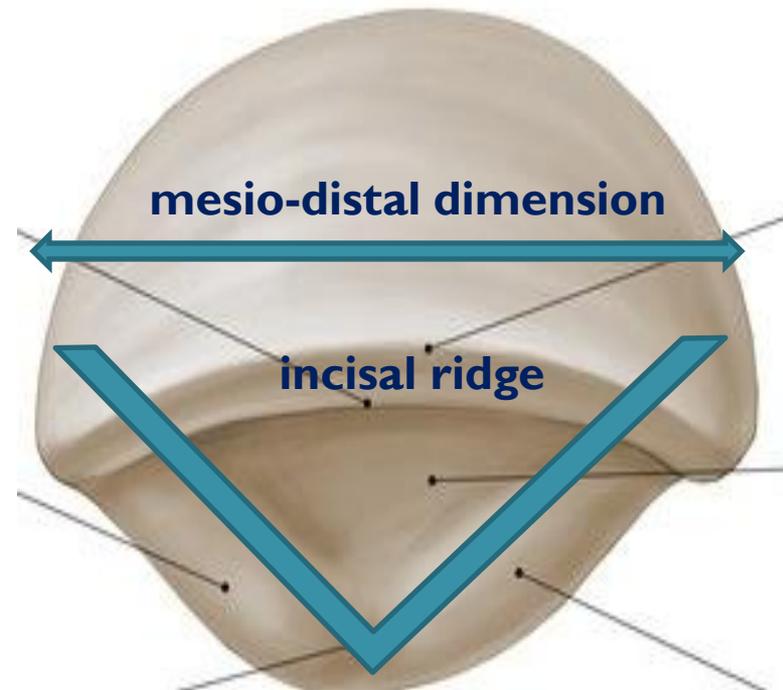
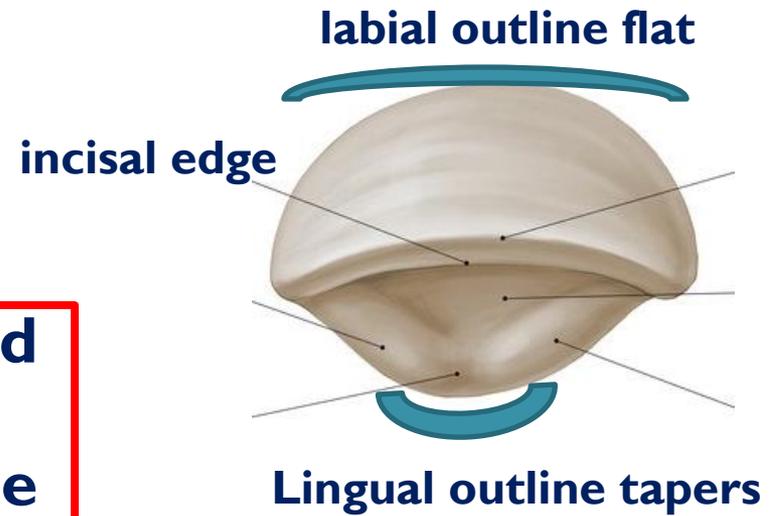
There is little difference between distal and mesial outlines.

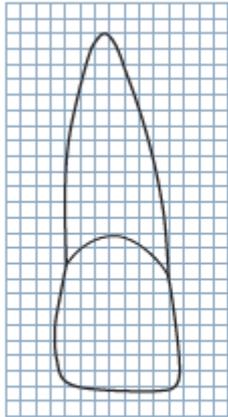
The curvature of the cervical line is less distally than mesially.



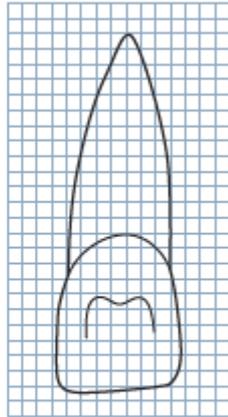
Incisal Aspect

1. The incisal edge is centered over the root.
2. The labial outline of the crown is broad and flat.
3. The incisal edge and incisal ridge are well-defined.
4. The outline of lingual part tapers lingually to the cingulum.
5. The mesio-distal dimension labially is greater than that lingually.
6. The crown has triangular shape, as the root shape in cross-section.

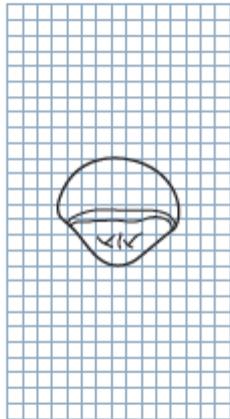




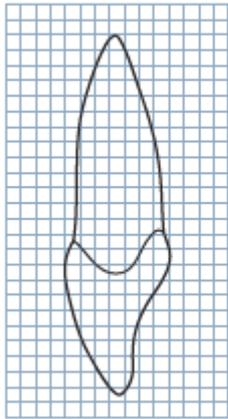
Labial



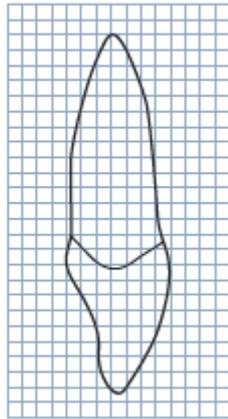
Lingual



Incisal



Mesial



Distal



Labial



Lingual



Incisal



Mesial



Distal

Figure 6-9 Maxillary central incisor

Average Dimensions (in mm)

Crown Length	Root Length	Mesiodistal Diameter of crown	Mesiodistal Diameter at Cervical Line	Labiolingual Diameter at Crest of Curvature	Labiolingual Diameter at Cervical Line	Curvature of Cervical Line	
						M	D
10.5	13.0	8.5	7.0	7.0	6.0	3.5	2.5

CHRONOLOGY

First evidence of calcification	3-4 months
Crown completion	4-5 years
Eruption	7-8 years
Root completion	10-11 years





**The
End**

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Maxillary Lateral Incisor

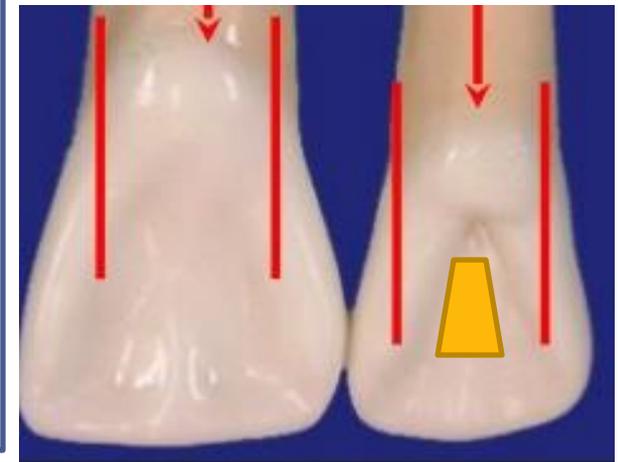
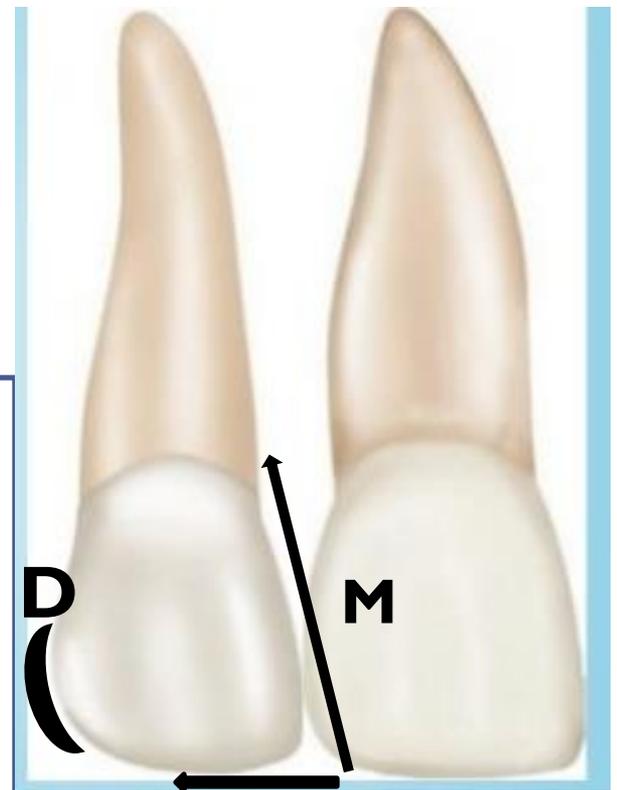
The maxillary lateral incisor resembles the maxillary central incisor in function, form, and anatomy; but it is generally smaller in all dimensions except the length of the root.



Maxillary Lateral Incisor

Principle identifying features

- 1- The crown is more rounded, shorter and narrower mesio-distally than the maxillary central incisor.
2. The mesio-incisal angle is acute and the disto-incisal angle is more rounded.
- 3- It has a single root with a tapered, distally curved, pointed apex.
4. The lingual fossa is more concave than that of the maxillary central incisor.

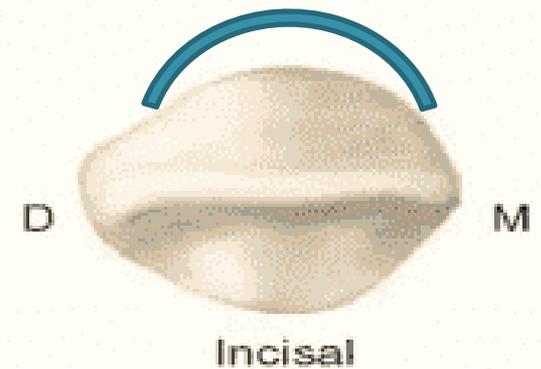


Labial Aspect

1. The crown is **shorter** and **narrower** than that of the maxillary central incisor, but the root is **as long as** that of the maxillary central incisor

2- The labial surface of the crown is **more convex** than that of the maxillary central

incisor.

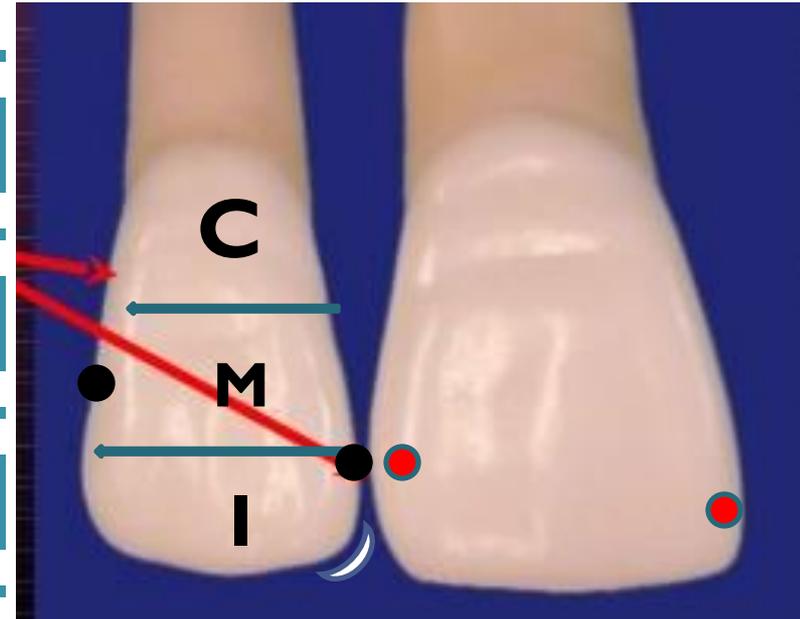


Labial Aspect

3- The mesial outline resembles that of the maxillary central incisor with more rounded mesio-incisal angle, with the crest of curvature (contact point) located at the junction of middle and incisal thirds.

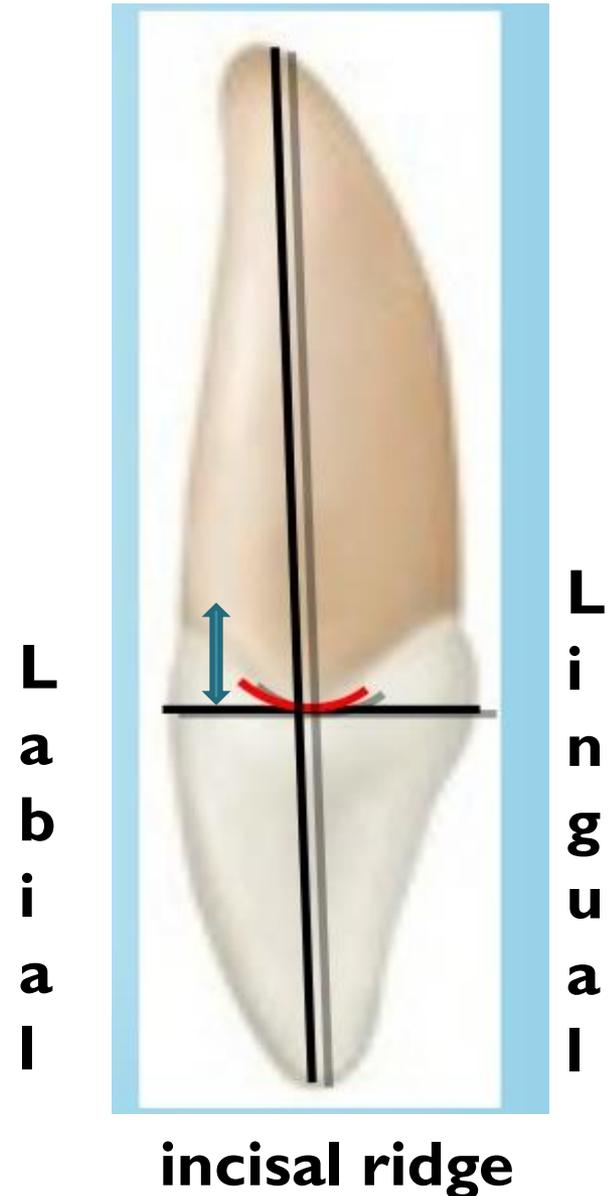
4- The distal outline is more rounded, with the crest of curvature (contact point) at the center of the middle third.

5- The root tapers evenly, and curves distally at the apex.



Mesial Aspect

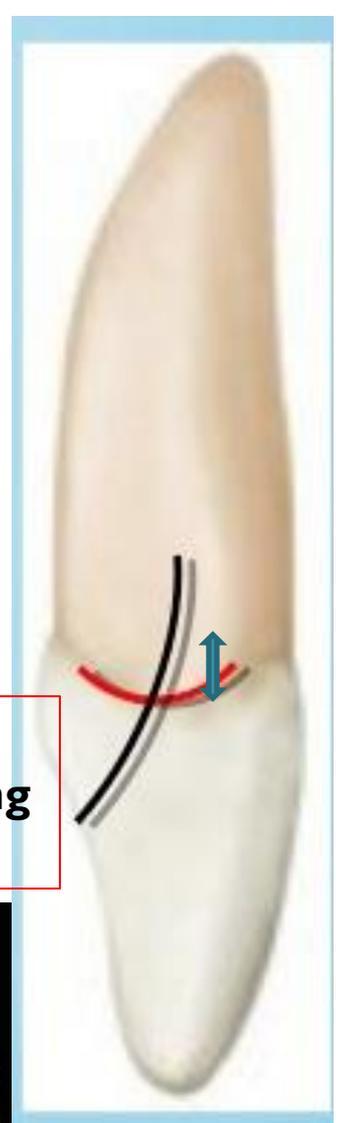
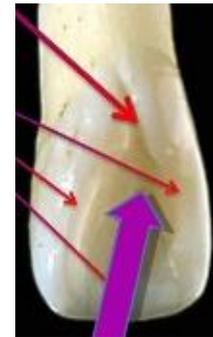
- The crown is narrower labiolingually than the maxillary central incisor.
- of the The curvature cervical line is less than that of the maxillary central incisor.
- The root appears as a tapered cone, and a line bisecting the root bisects the incisal ridge, which is well developed.



Distal Aspect

- The curvature of the line distally cervical is less than that mesially.
- It is not uncommon to find a developmental groove extending to the root distally.

developmental groove extending distally

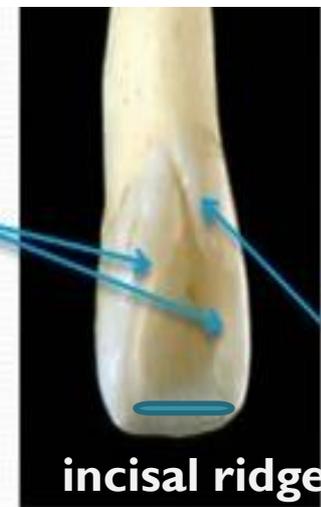


Lingual Aspect

1. The mesial and distal marginal ridges and the lingual portion of the incisal ridge are well marked, with a more concaved lingual fossa.

2- The cingulum is prominent, with a tendency toward seeing a deep developmental groove extending distally within the lingual fossa.

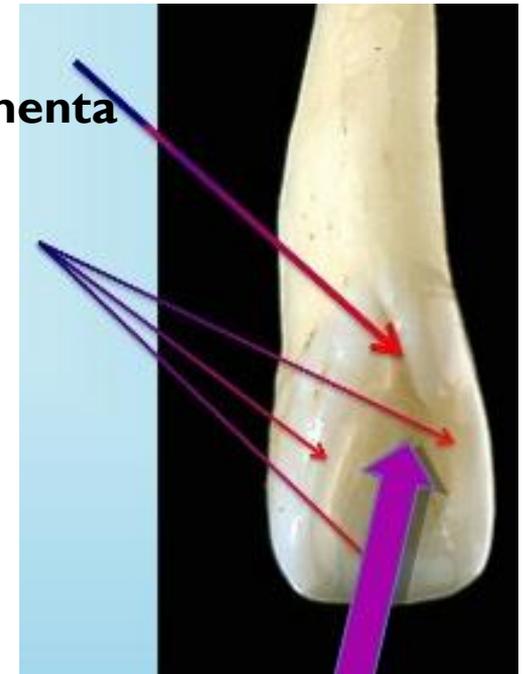
Prominent marginal ridges



Prominent cingulum

incisal ridge

developmental groove



lingual fossa

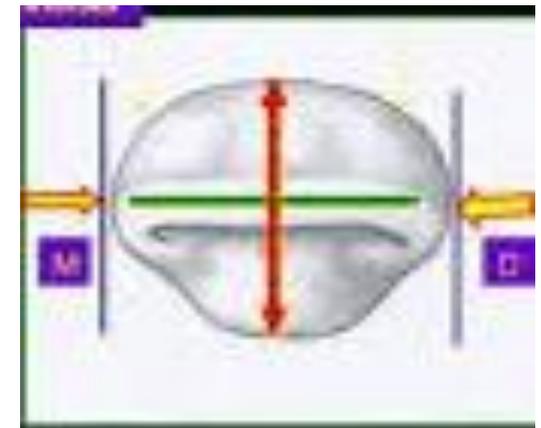
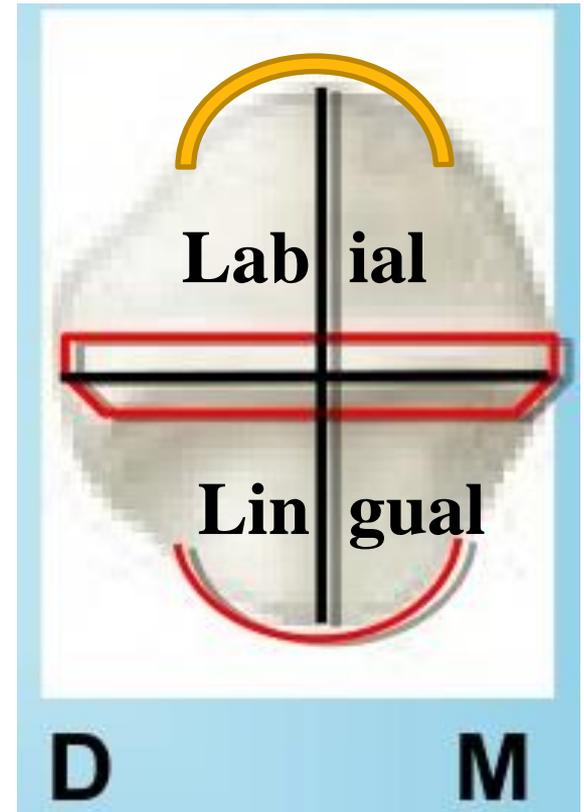
Incisal Aspect

incisal aspect resembles that of The maxillary central incisor, but:

(A) The cingulum and incisal ridge may be large.

(B) The labio-lingual to mesio-distal measurement is larger; therefore, it resembles a small canine.

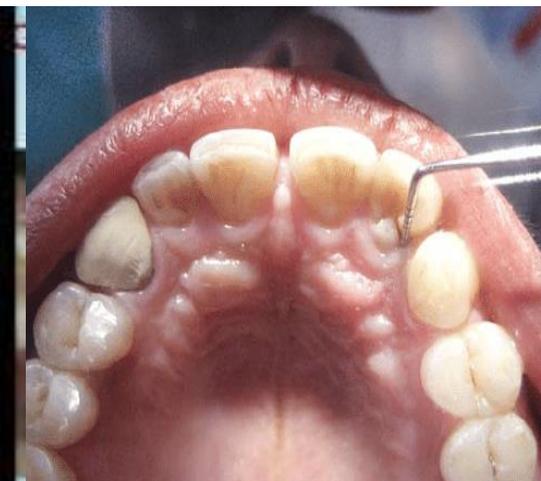
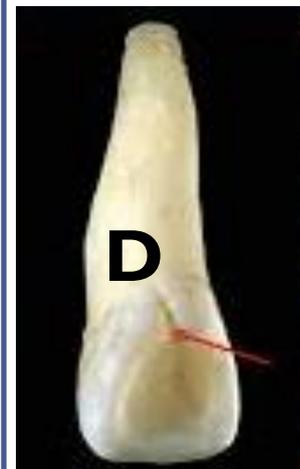
2- From the incisal aspect, all maxillary lateral incisors exhibit more convexity labially and lingually.



maxillary central incisor

Variations from the typical form (Anomalies)

1. **Peg-shape lateral incisor, with a thin root and a small conical crown**
- 2- **The maxillary lateral incisor may be congenitally missing.**
- 3- **Large developmental groove on the distal aspect extending to the root.**





The End

Dental Anatomy

Lec.7

م.م ظفار علوان

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Oral &Maxillofacial pathology



General Characteristic Features of the Canines

The canines are placed at the “corners” of the mouth, which help in keeping facial expressions at the cosmetic value. •

The canines are the longest teeth in the mouth. •

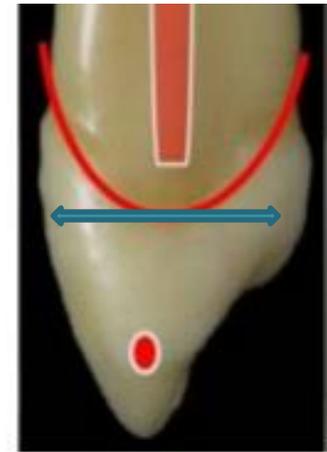
The canines are the strongest teeth in the mouth. •



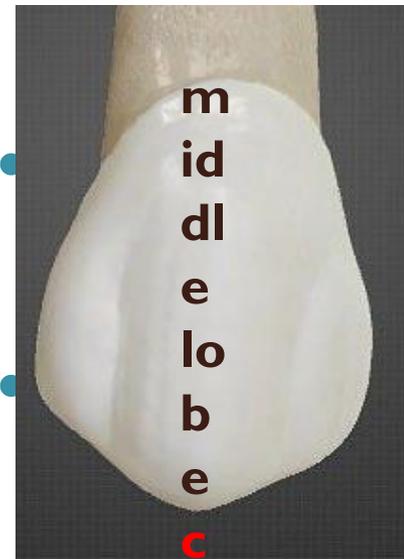
The canines are the most stable teeth in the mouth because of the followings:

- They have large labio-lingual dimension.
- They have long roots, which are well anchored in the alveolar bone.
- The crown shape of the canine allows for “self-cleansing”, so they stay for longer time.
- The middle labial lobe is highly developed incisally into a strong, well-formed cusp.

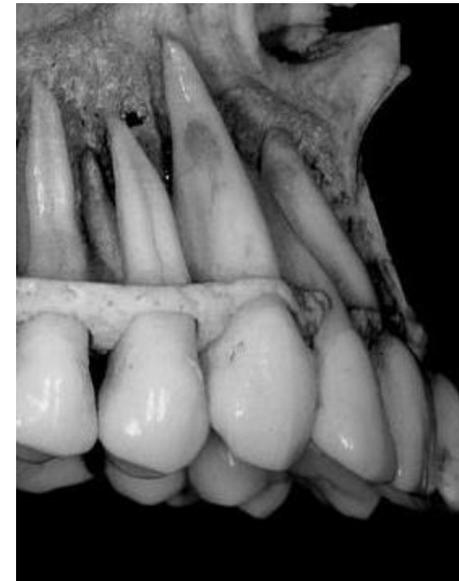
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The Permanent Maxillary Canine

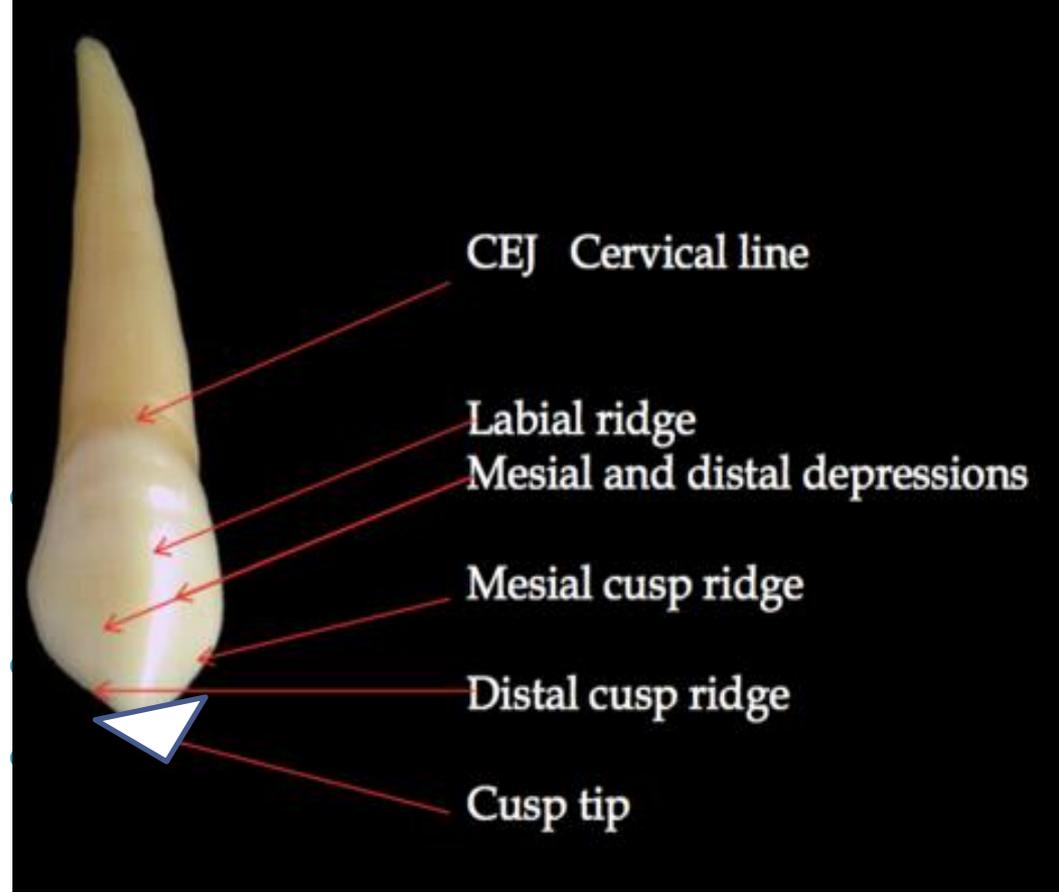
Principal Identifying Features

Single pointed cusp.

The distal slope of the cusp is longer than the mesial slope.

Marked convex labial outline and bulky palatal cingulum.

Very long single root.



The Labial Aspect

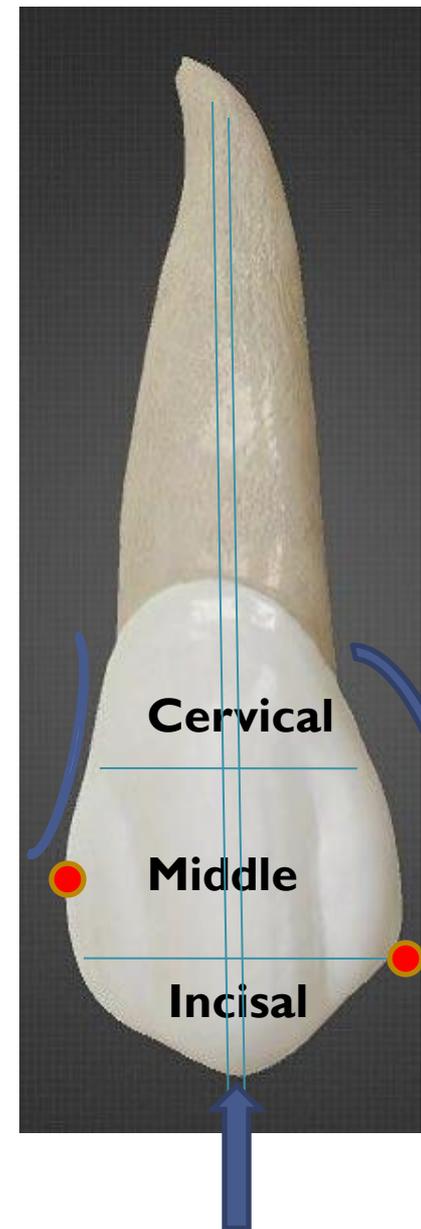
- The mesial outline of the crown is convex from the cervical line to the crest of curvature, which is located at the junction of the incisal and middle thirds.

- The distal outline of the crown is slightly concave from the cervical line to the crest of curvature, which is located at the center of the middle third.

- The tip of the cusp is in a line with the crest of curvature.

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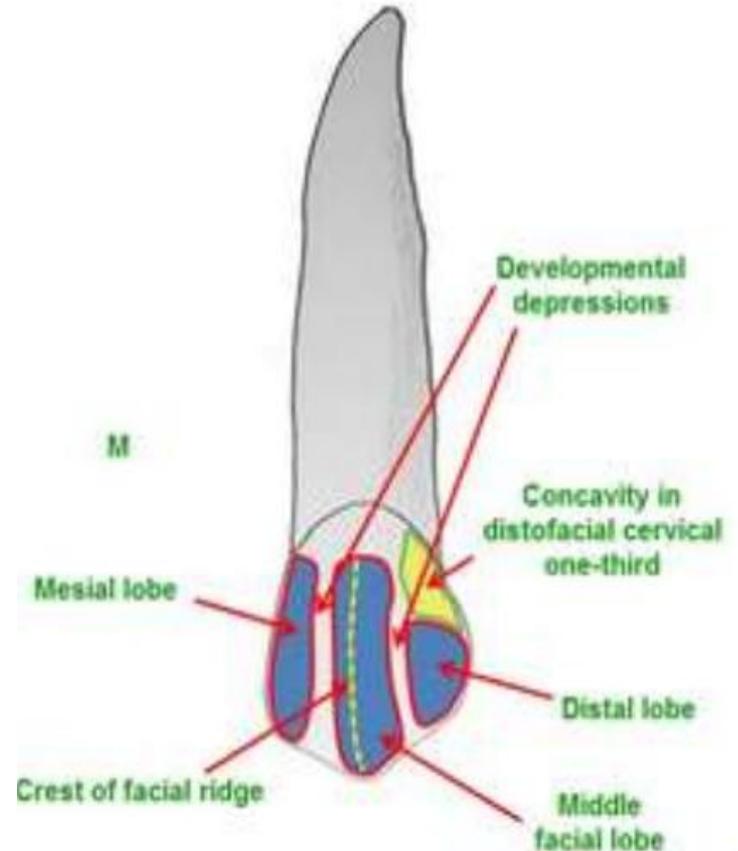
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tip of the cusp

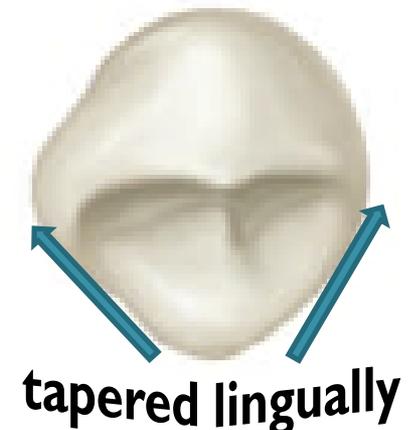
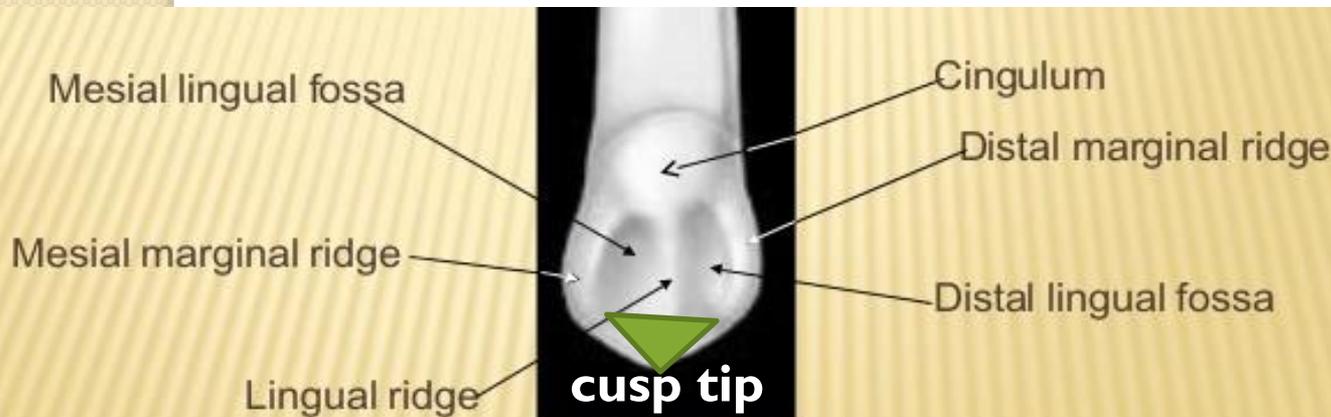
The Labial Aspect

- The distal slope of the cusp is longer than the mesial slope.
- The cervical line is convex toward the root.
- The labial surface is smooth except for a shallow depression mesially and distally dividing the three lobes, the middle lobe much more developed producing the labial (facial)ridge.
- The root is long and conical, with the apex curved distally.



The Lingual Aspect

- The tooth is narrower lingually than labially (i.e., tapered lingually).
- The cingulum in the maxillary canine is larger than that in the maxillary central and lateral incisors.
- There is a well developed lingual ridge confluent with the cusp tip, which divides the lingual fossa into two fossae.

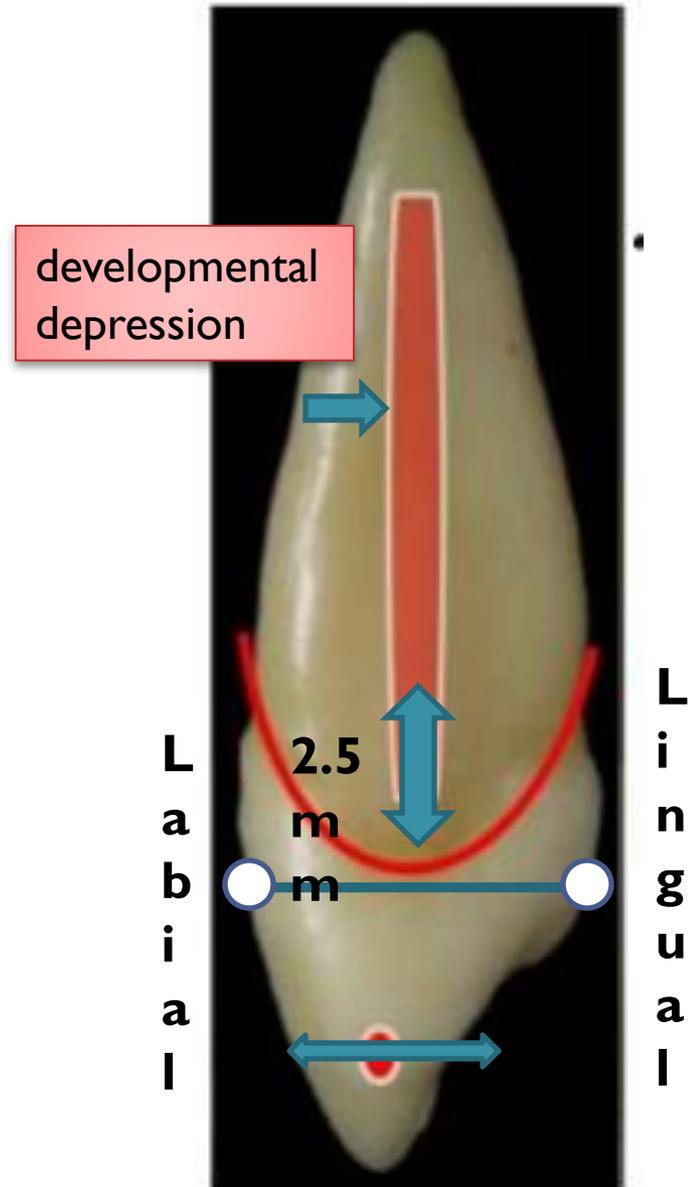


The Mesial Aspect

- The labial and lingual outlines of the crown are more convex than that in the maxillary central and lateral incisors, with the crest of curvature (labially and lingually) located at the cervical thirds.

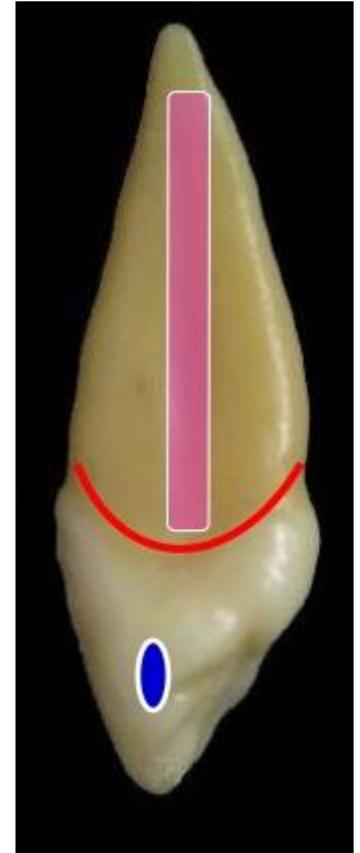
- The curvature of the cervical line is 2.5mm towards the cusp.

- There is a developmental depression extending on part of the root



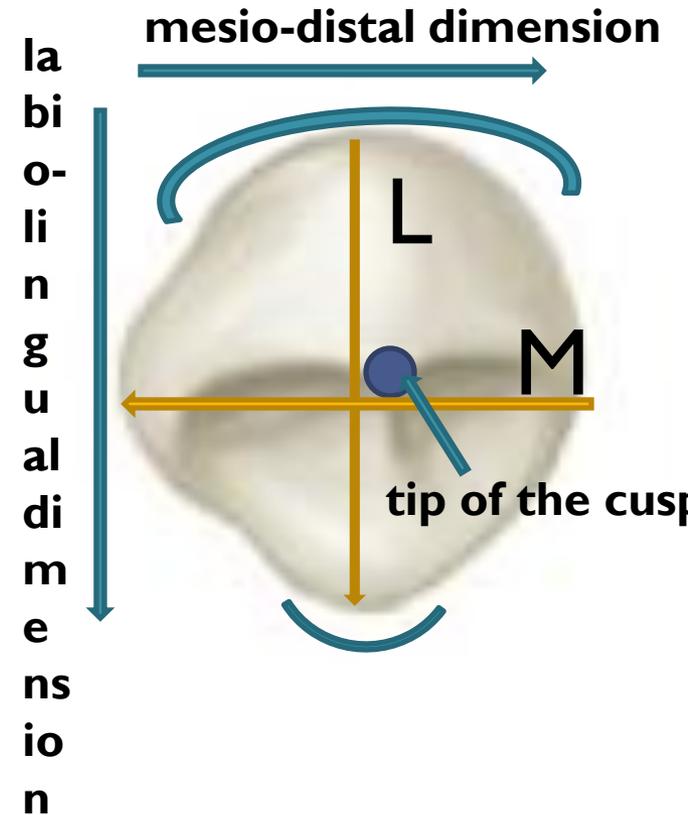
The Distal Aspect

- The curvature of the cervical line is less distally than mesially (as in the maxillary central and lateral incisors).
- The developmental depression of the root is more pronounced distally than mesially.



The Incisal Aspect

- The labio-lingual dimension is greater than the mesio-distal dimension.
- The ridge of the labial lobe is very noticeable labially, with its greatest convexity at the cervical third.
- The cingulum is well developed and makes a small arc when compared with the labial outline which makes a large arc.
- The tip of the cusp is labial to the center labio-lingually, and at or slightly mesial to the center mesio-distally



Maxillary right canine



Labial



Lingual



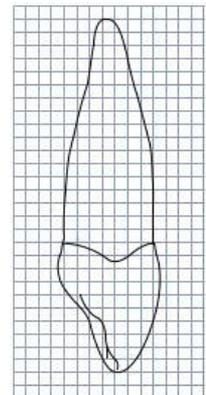
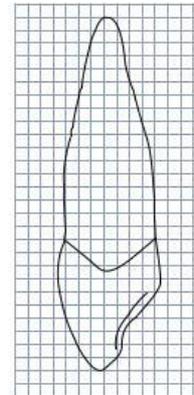
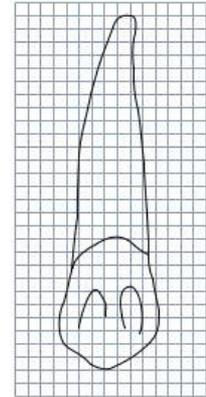
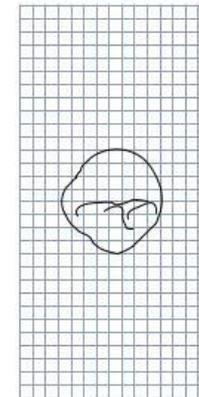
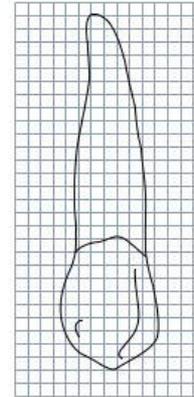
Incisal



Mesial



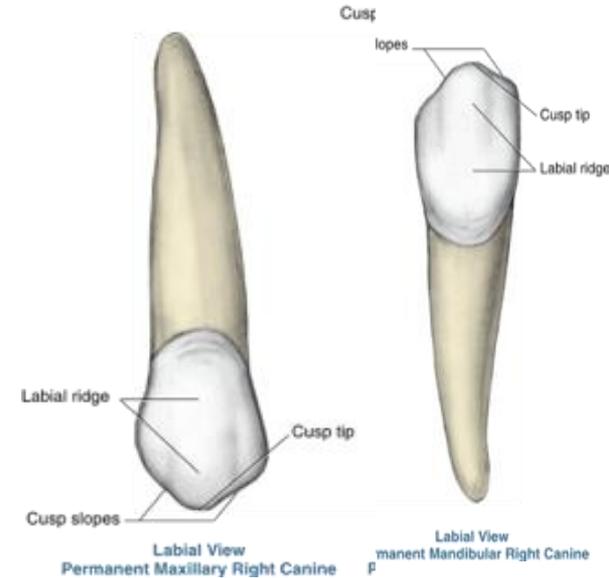
Distal



The Permanent Mandibular Canine

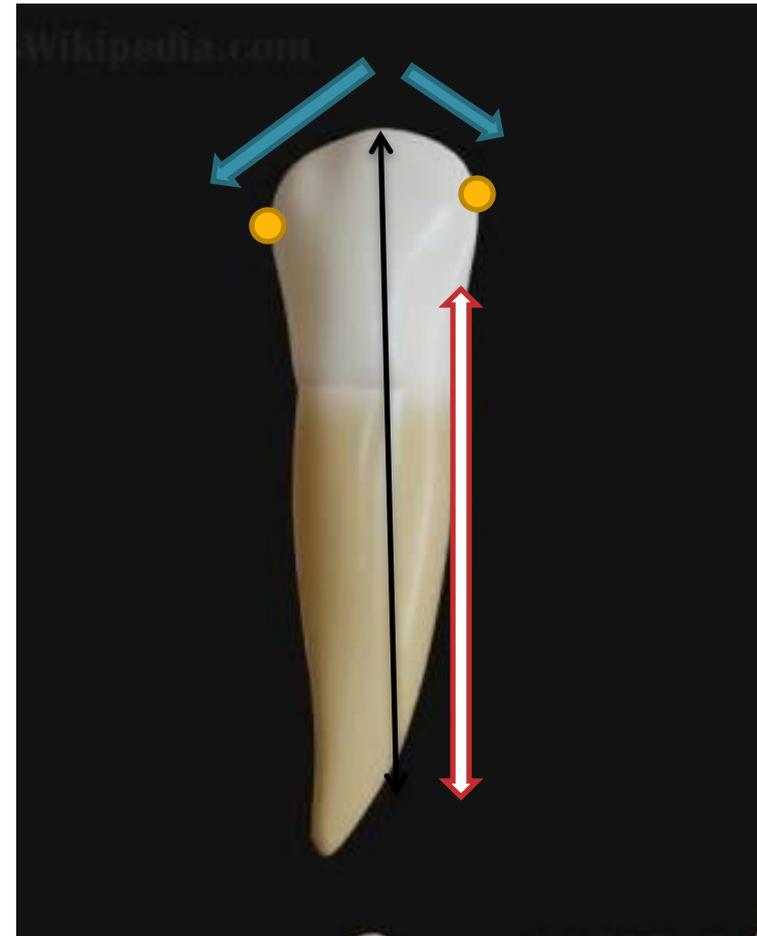
Principal Identifying Features

- The mandibular canine is narrower mesio-distally and labio-lingually than the maxillary canine.
- The lingual surface of the crown of the mandibular canine is shorter than that of the maxillary canine, with less developed cingulum and less prominent marginal ridges.
- The cusp of the mandibular canine is not as well-developed as that of the maxillary canine.



Principal Identifying Features

- The tip of the cusp is not in a line with the center of the root.
- The mesial slope of the cusp is shorter than the distal slope.
- The distal outline of the crown is more rounded than the mesial outline.
- The mesial surface of the crown is nearly straight with the mesial surface of the root, with the contact area being near the mesio-incisal angle.
- is located contact area distal The the maxillary more incisally than canine.





THE END