



**01**

**CHAPTER**

## **INTRO OF DENTAL ANATOMY**

**مقدمة في تشريح الأسنان**

### **TOPICS**

- ① DENTAL ARCHES & TEETH**
- ② HUMAN DENTITIONS**
- ③ DENTAL FORMULA**
- ④ FUNCTIONS OF TEETH**
- ⑤ TOOTH ANATOMY**
- ⑥ TOOTH NUMBERING SYSTEMS**



**Scientific content prepared by**  
**Booknerd Team**



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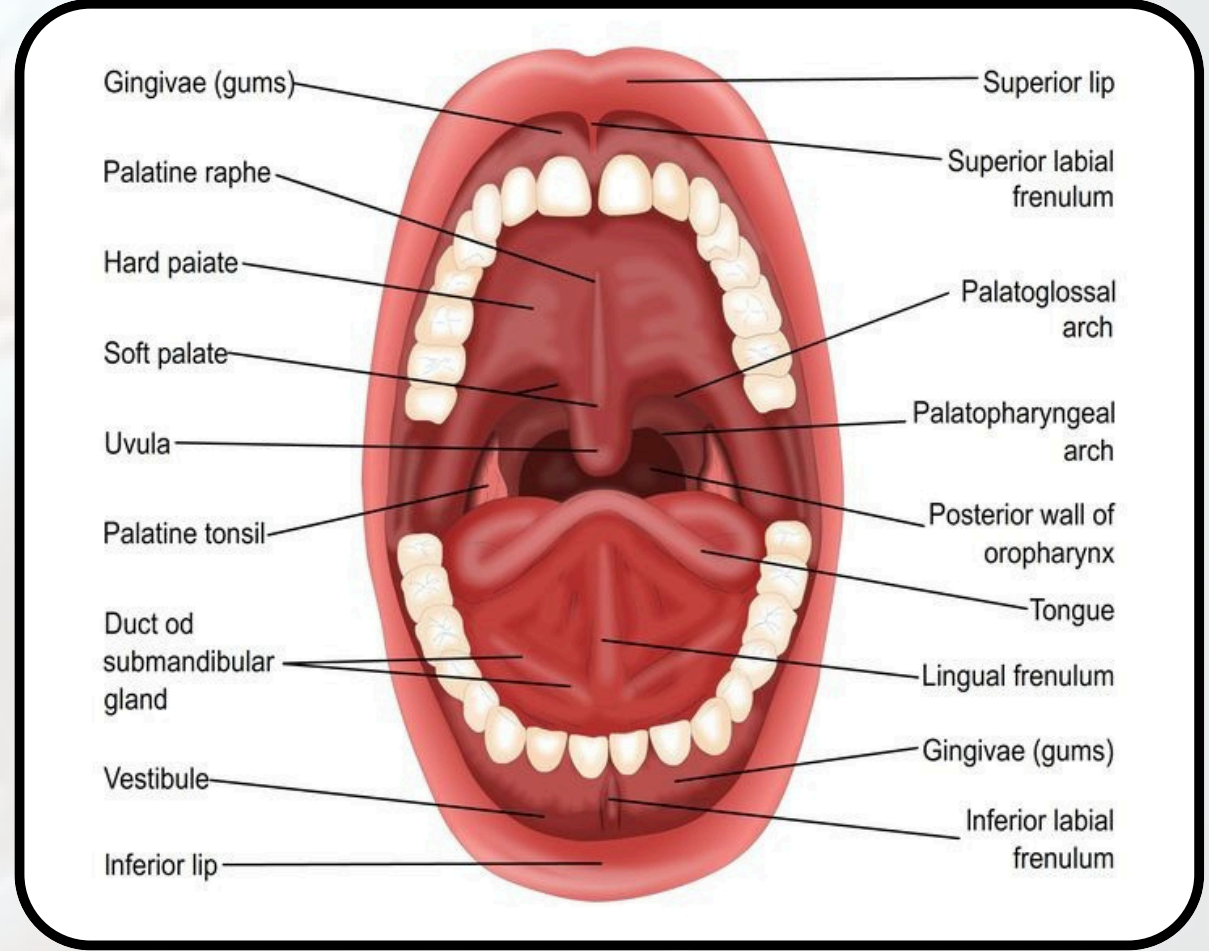
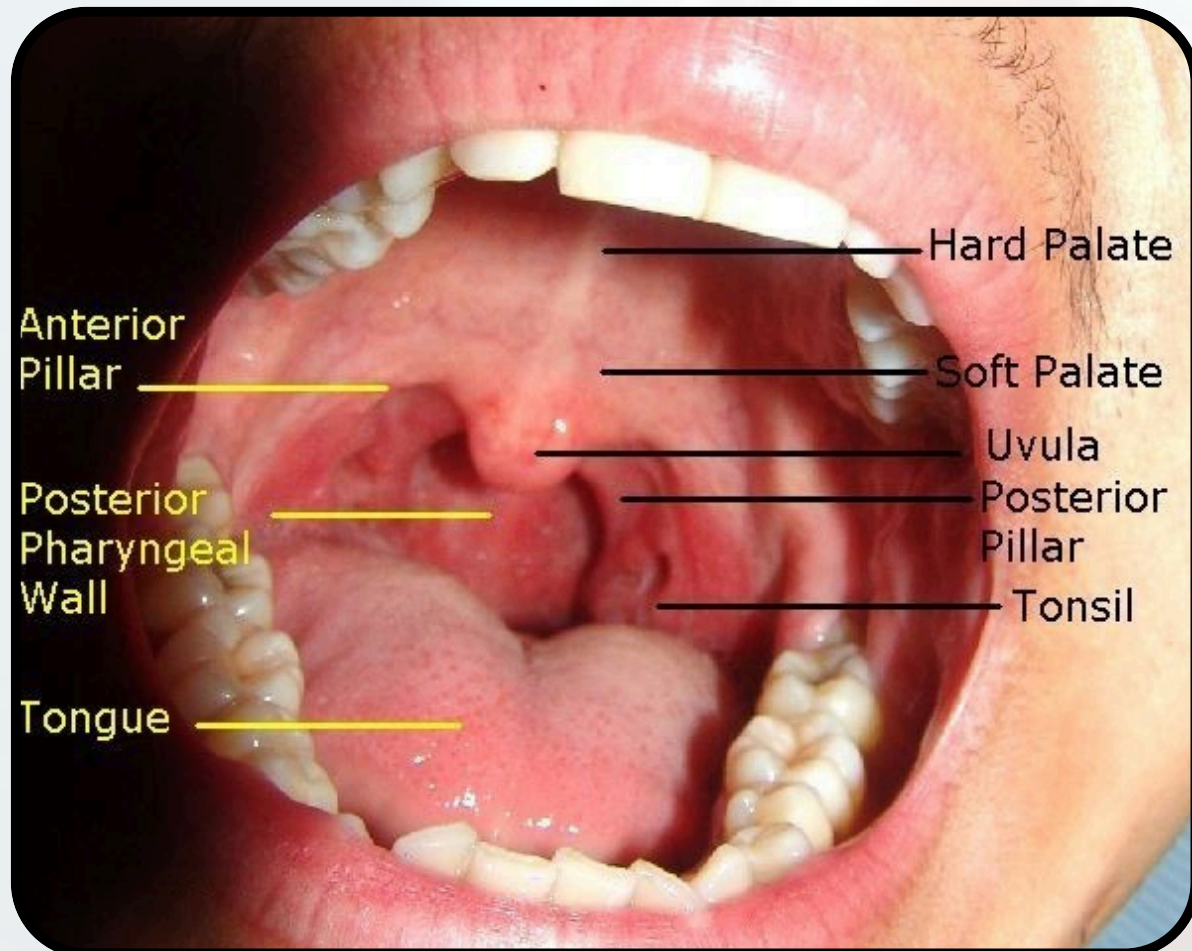
**DENT - 6 OCT**







## Oral cavity



## Oral cavity

is the 1st part of the digestive system that contains the structures necessary for **mastication & speech**; teeth, tongue & salivary glands.

## Teeth

Teeth are arranged in the oral cavity in 2 arches called the **Dental Arches**, one lower & one upper.

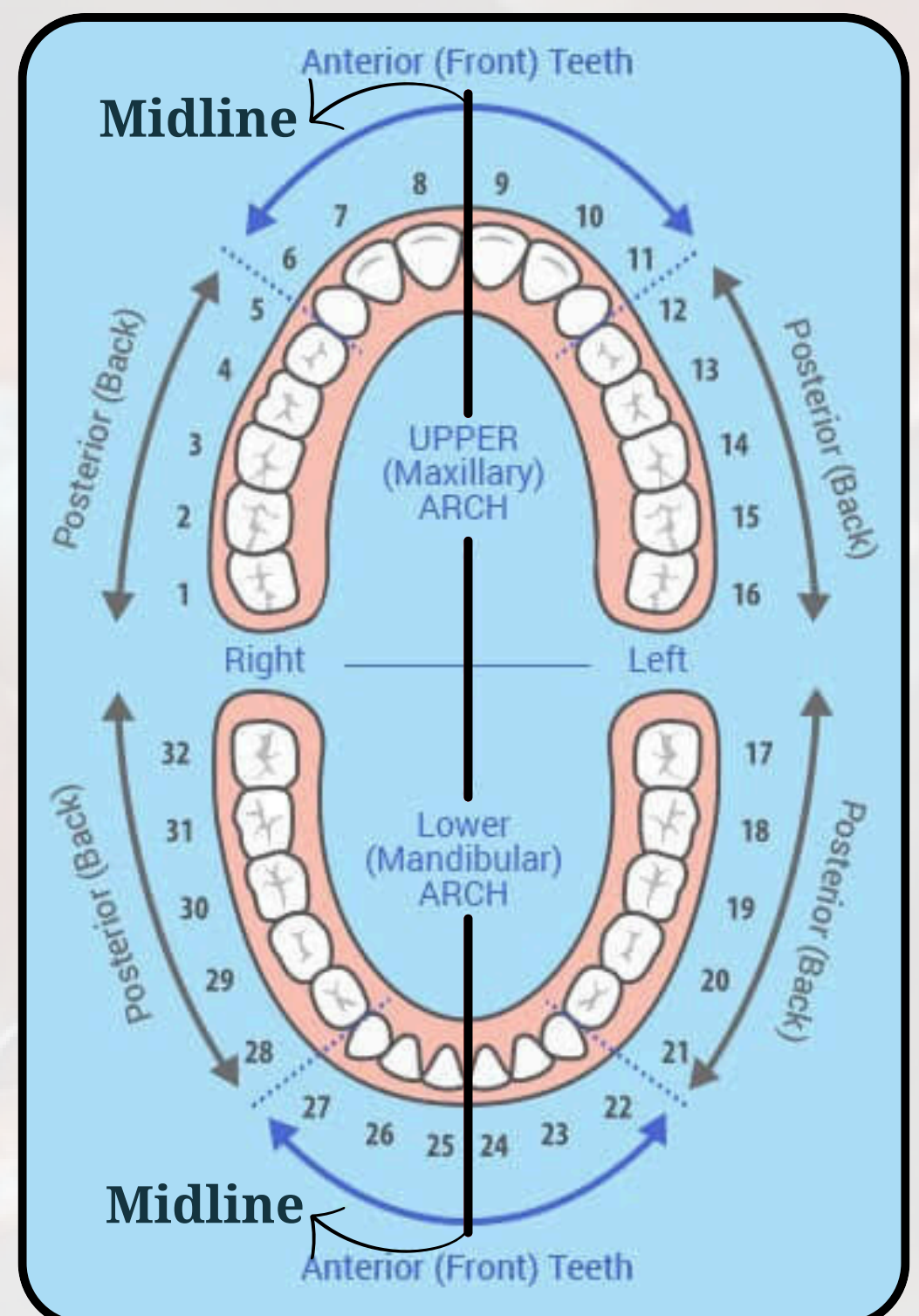
- The Upper Arch is called the **Maxillary arch**, the teeth in this arch are called **Upper or Maxillary Teeth**.
- The lower arch is called the **Mandibular arch**, The teeth in this arch are called **Lower or Mandibular Teeth**.

Each dental arch has a **Midline** (vertical imaginary line) that divides the arch into 2 approximately equal right & left halves.

There are **4 Quadrants** in the entire oral cavity.

In The Oral Cavity There Are 4 Classes Of Teeth.

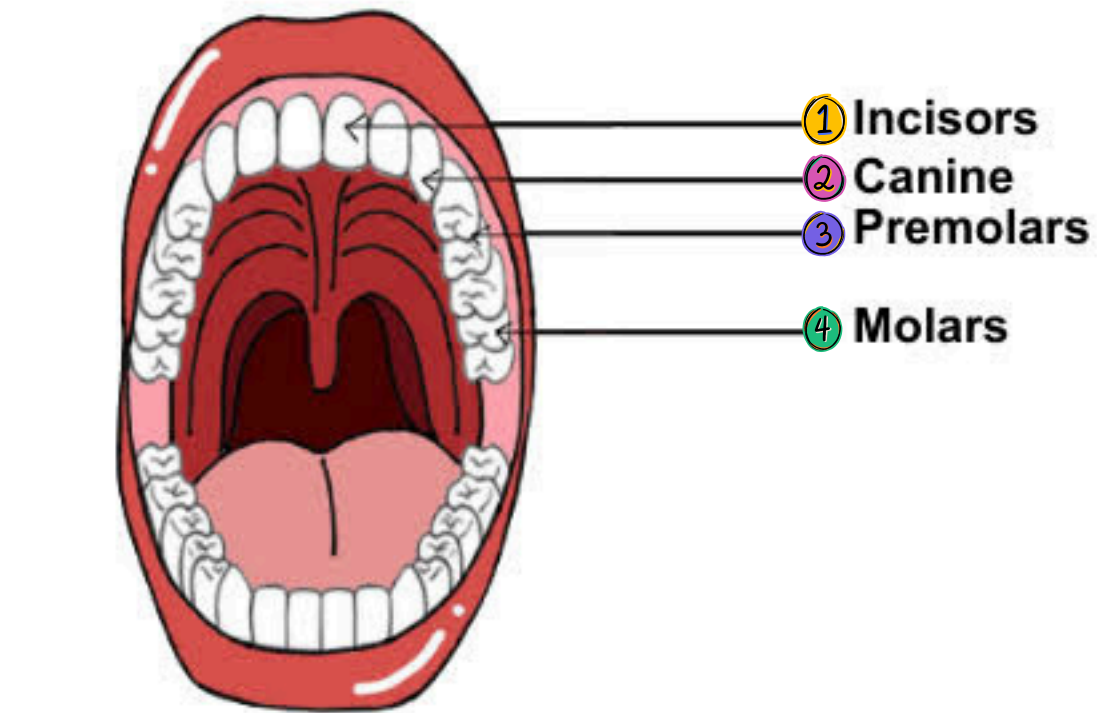
1. Incisors
2. Canines
3. Premolars
4. Molars







### Types of Teeth



Incisors



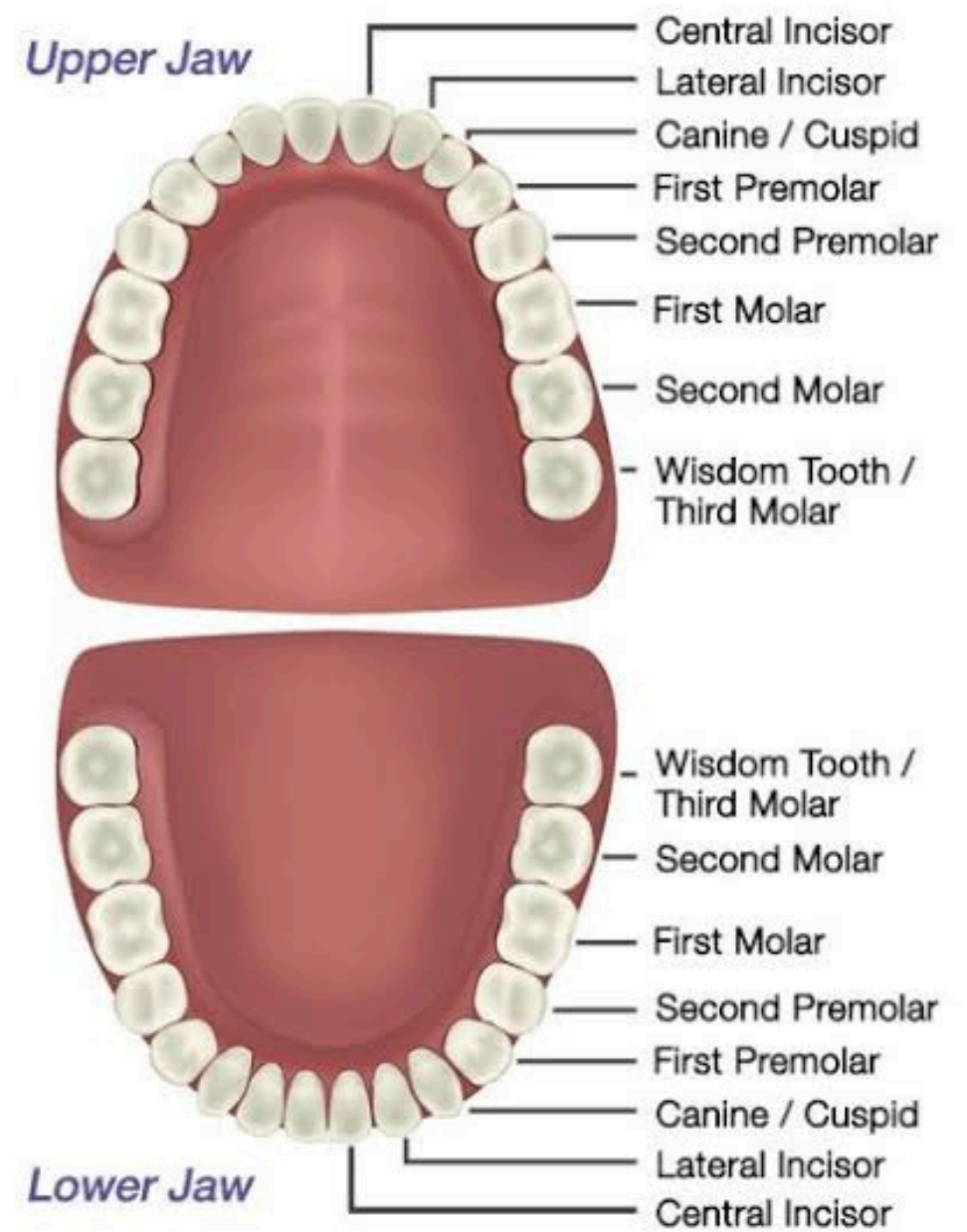
Canine



Premolars



Molars



#### 1-Incisors

- There are 2 incisors, the **central** incisor & the **lateral** incisor, in each quadrant.

#### 2-Canines

- one** canine in each quadrant.

#### 3-Premolars

- There are 2 in each quadrant. **1st & 2nd premolars**.

#### 4-Molars

- There are 3 in each quadrant. They are the 1st molar, the **2nd molar and the 3rd molar**.

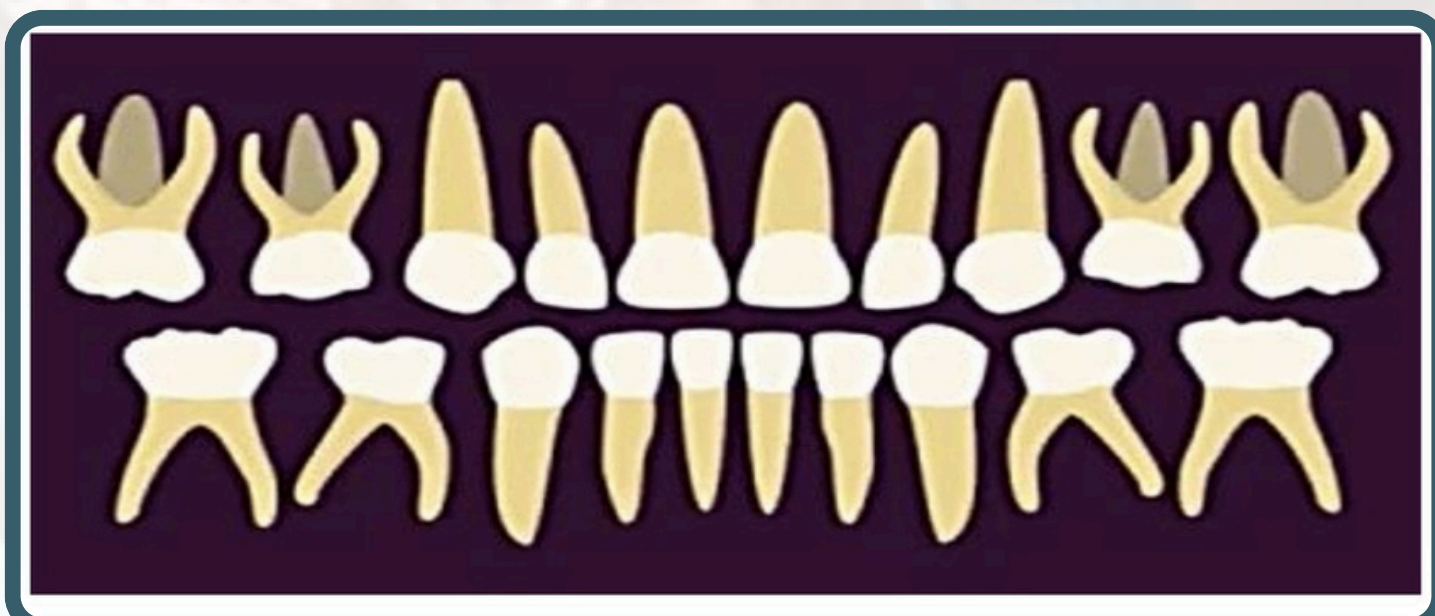
The incisors & canines are considered as **anterior teeth**.

Molars & premolars are considered as **posterior teeth**.

### The dentition

- A human has 2 types of dentitions.

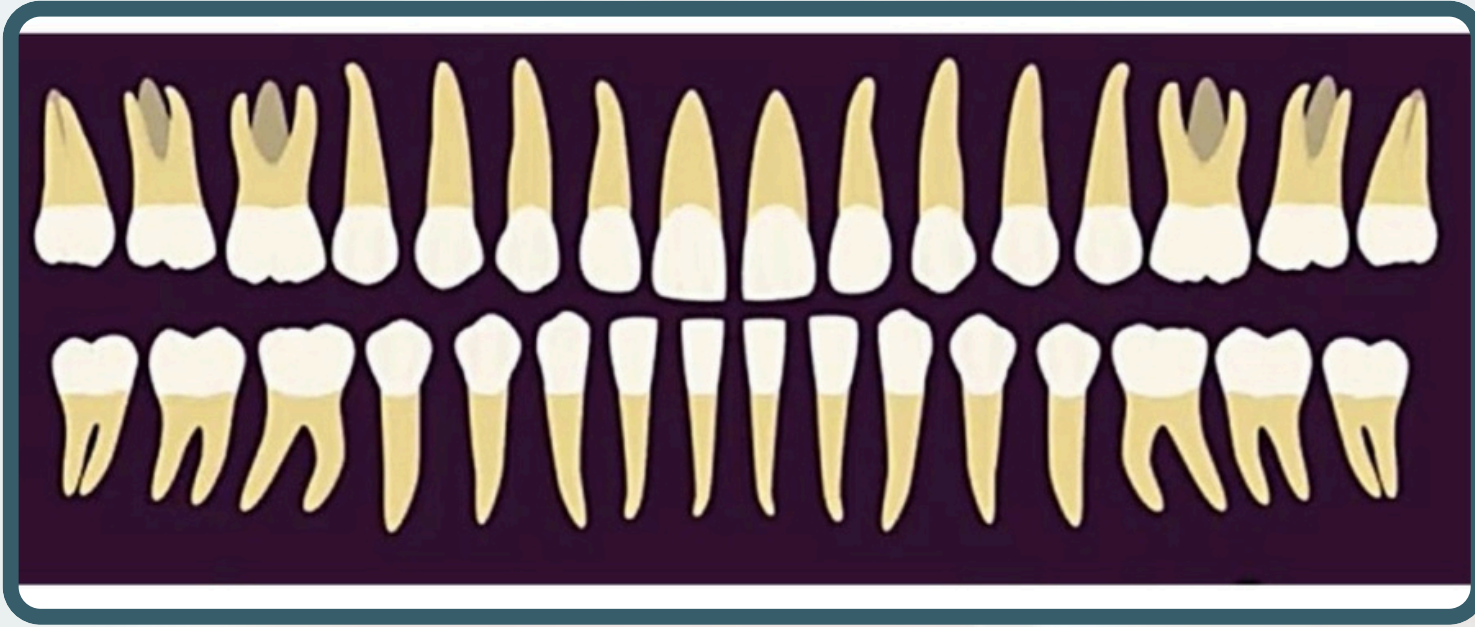
#### ① Primary (deciduous)







## ② Secondary (permanent)

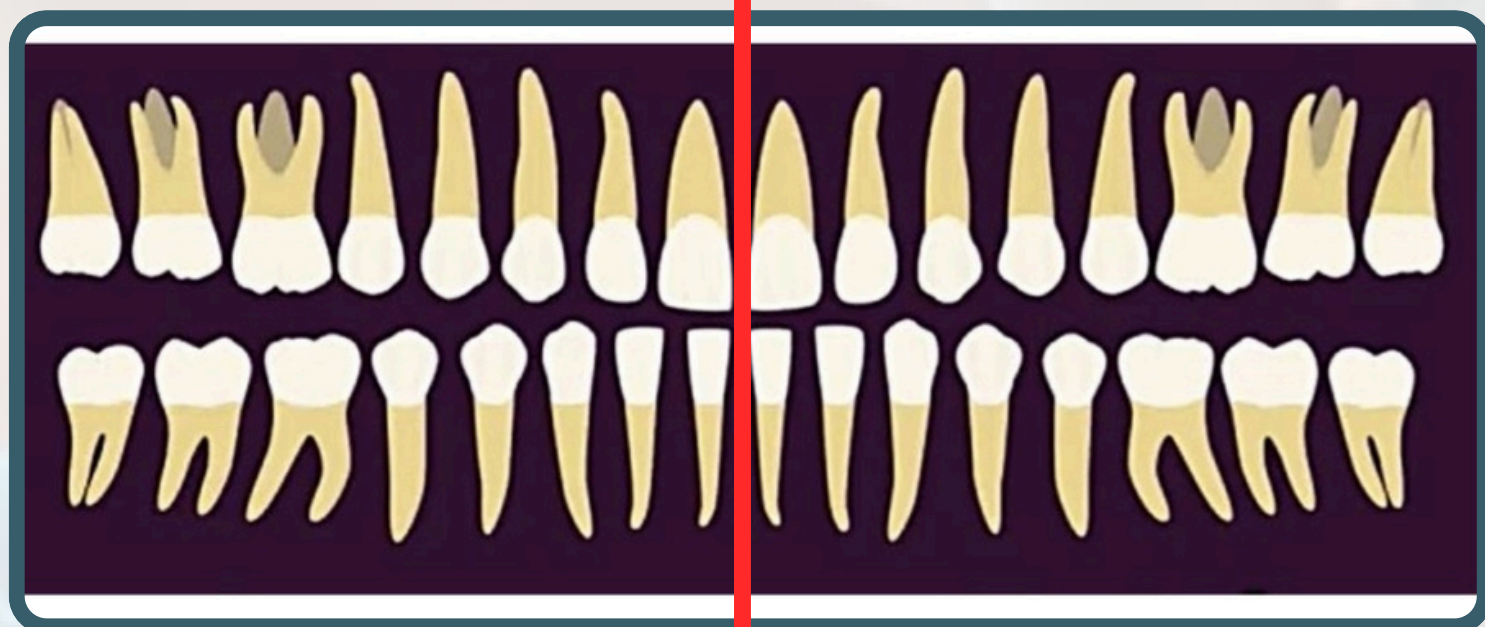


### Dental formula

- The **class** & **number** of teeth for **each dentition** are expressed by a dental formula.
- The formula includes one side only, right or left.
- The class of each tooth is represented by its initial letter.
- Then, followed by a **horizontal line**, the number of each type of teeth is placed above the line for the maxilla & below the line for the mandible.

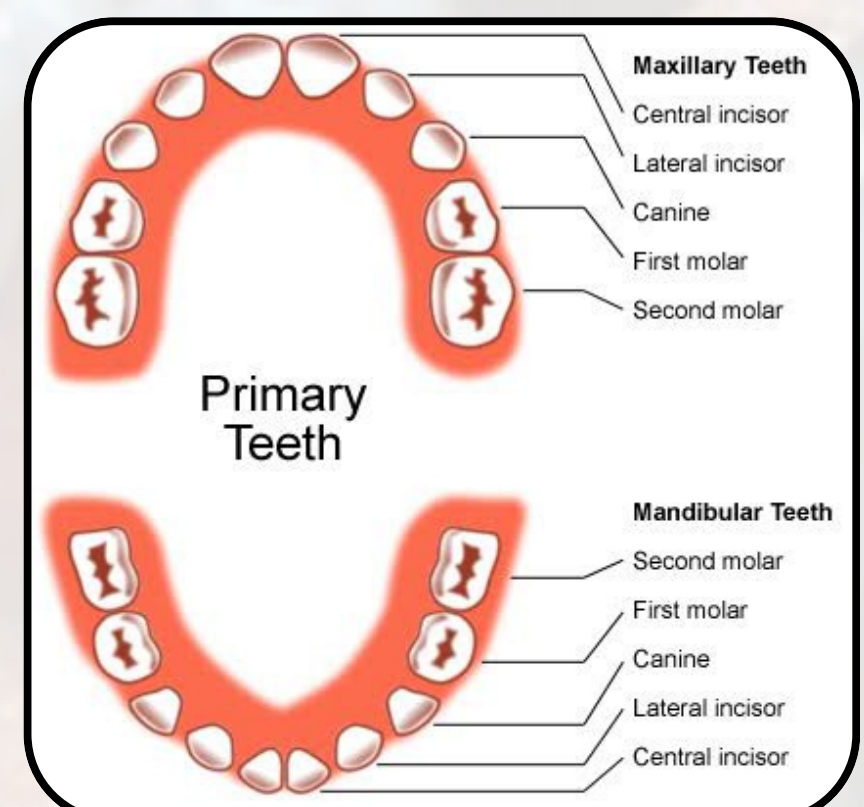
Incisors

**I**  $\frac{2}{2}$



## ① The primary dentition (deciduous)

- 20 teeth. 10 maxillary & 10 mandibular.
- 5 teeth are present in each quadrant.
- 2 Incisors. (Capital I)
- 1 Canine. (Capital C)
- 2 Molars. (Capital M)



• The dental formula is  $= I \frac{2}{2} C \frac{1}{1} M \frac{1}{1} = 10$

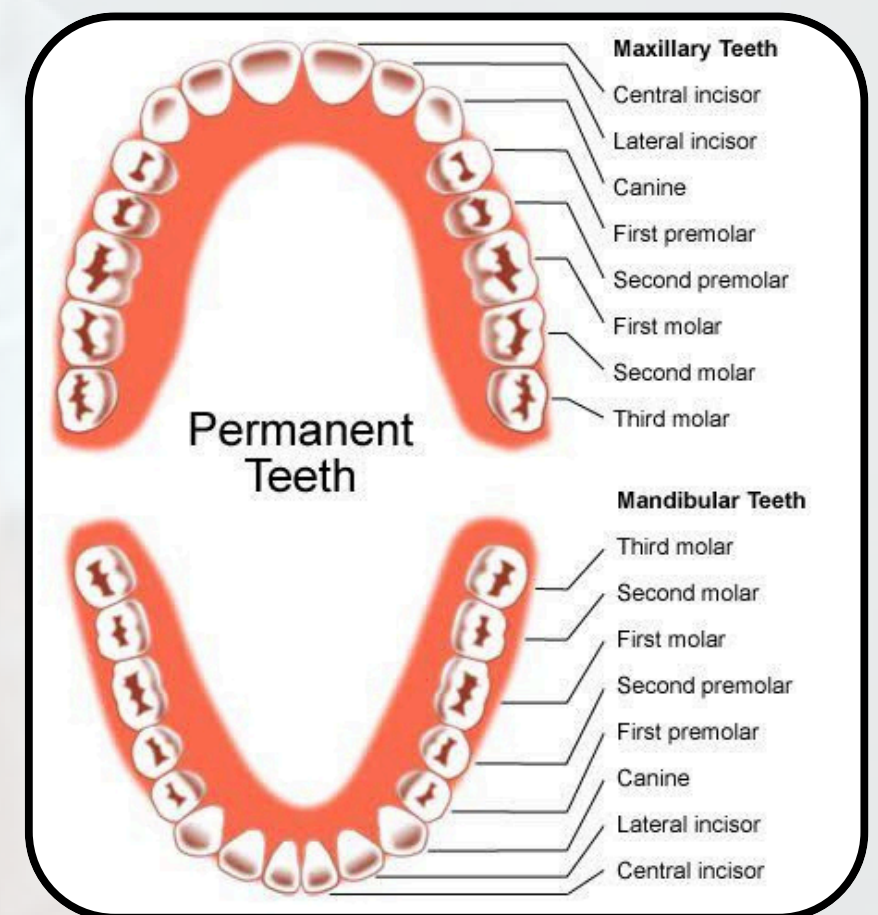
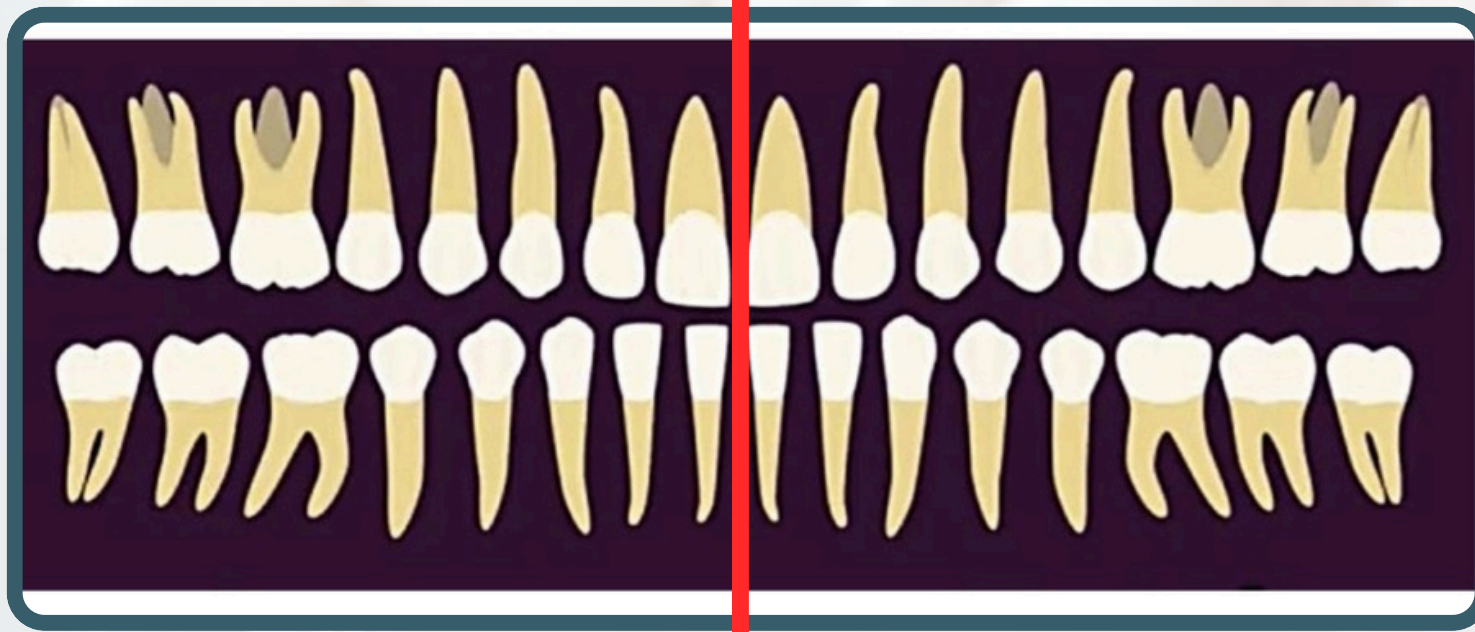






## ② The permanent dentition (succedaneous)

- 32 teeth, 16 maxillary & 16 mandibular.
- 8 teeth are present in each quadrant:
- 2 incisors.
- 1 canine.
- 2 premolars.
- 3 molars.



- The dental formula is 
$$= I \frac{2}{2} \quad C \frac{1}{1} \quad P \frac{2}{2} \quad M \frac{3}{3} = 16$$

### Important Note

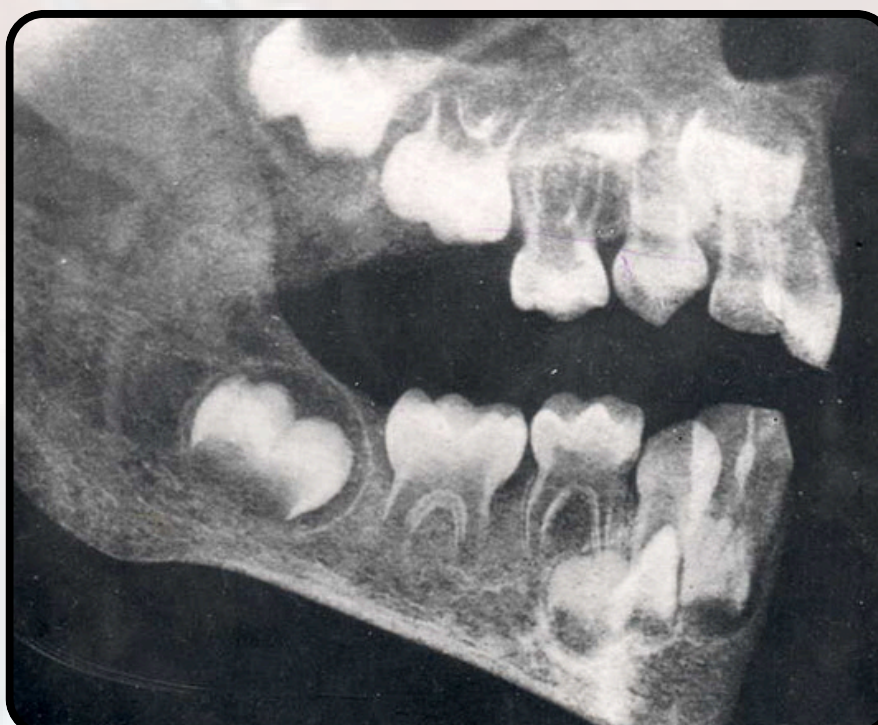
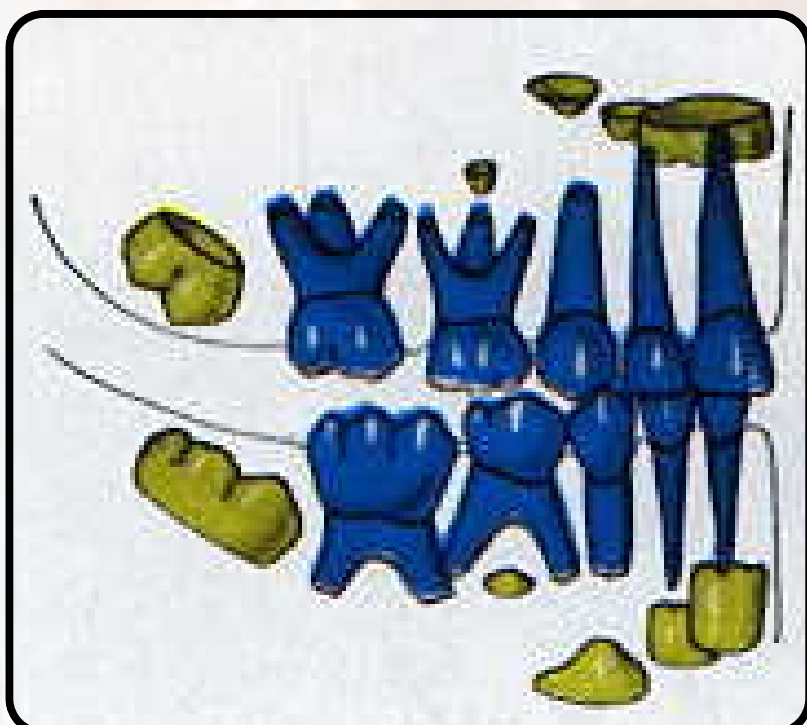
! The permanent molars are not preceded with deciduous teeth so they may be termed as **non succedaneous**.



## Different dentition periods

### ① Deciduous Dentition

- The teeth begin to appear in the oral cavity at the age of 6 months and stay to about 6 years. (6m- 6y)



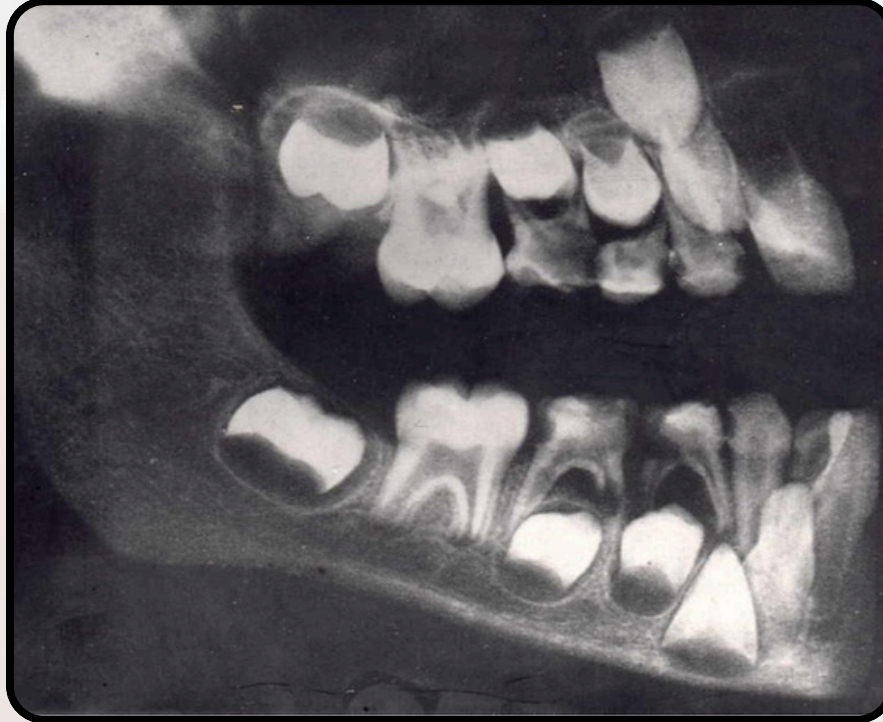
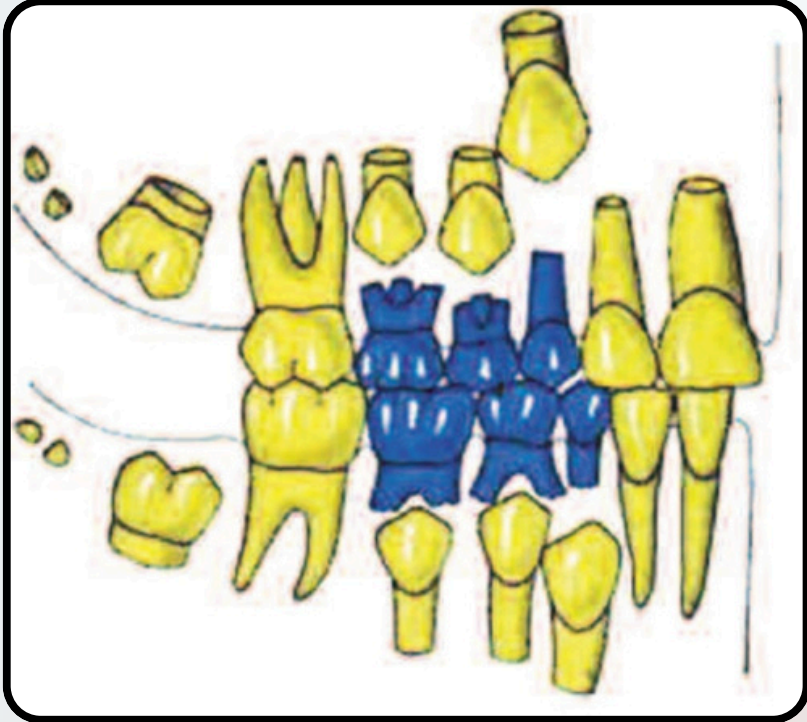




## ② Mixed dentition

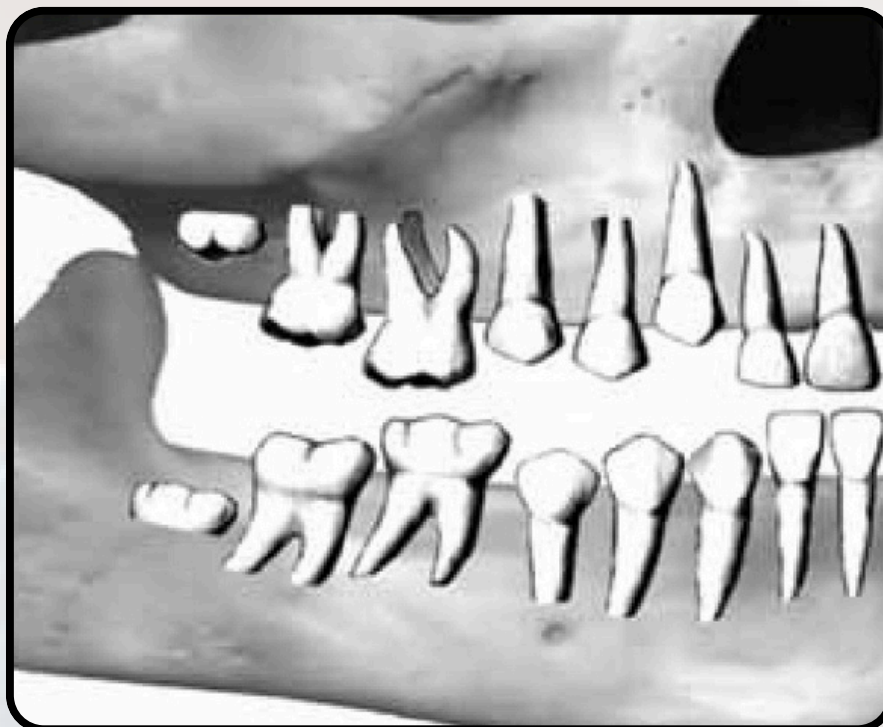
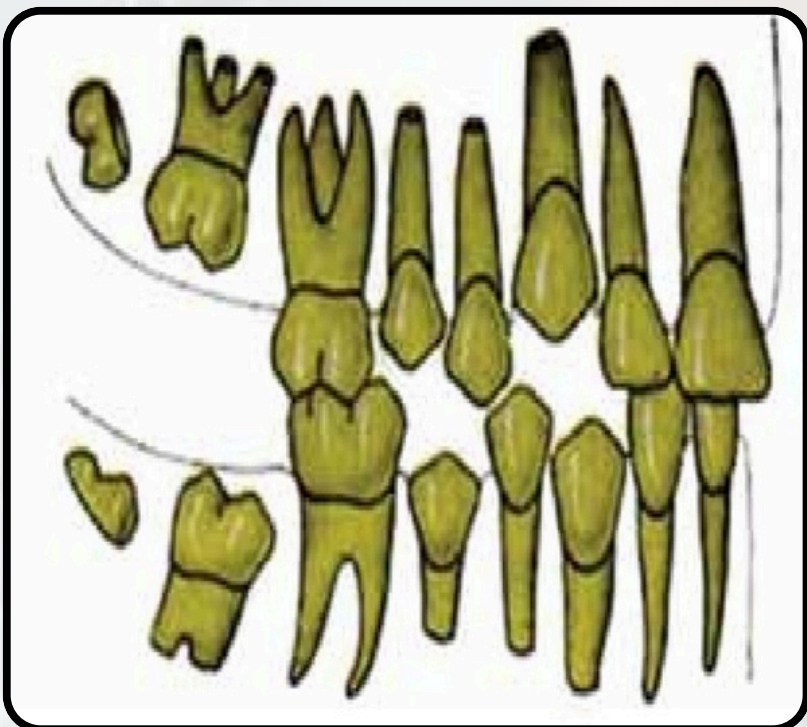
- Mixed dentition period lasts from about 6 to 12 years of age (6y-12y).

**Shedding:** the physiological loss of the deciduous teeth and replacement by permanent teeth.



## ③ Permanent dentition

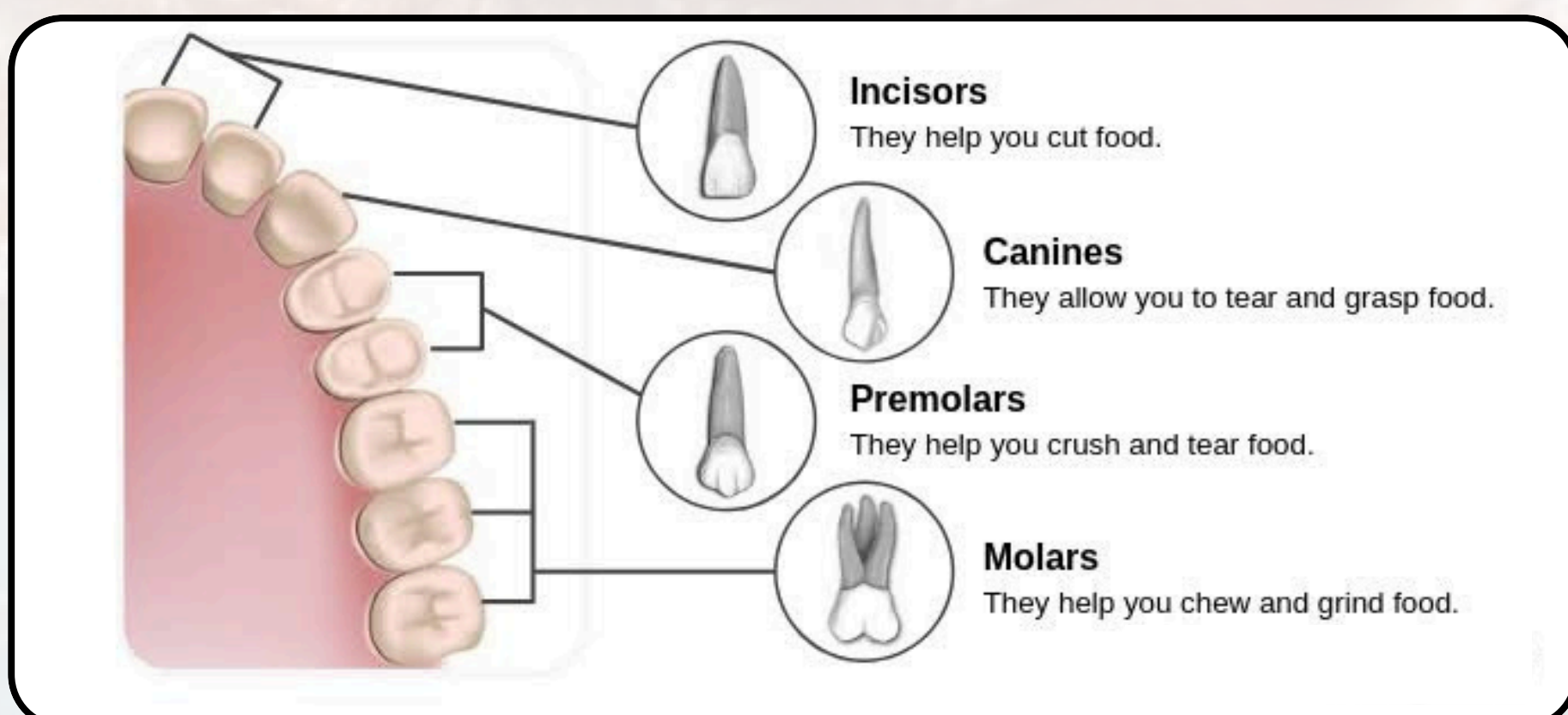
- The permanent dentition period is start at about 12y



## FUNCTIONS OF TEETH

### ① Mastication

- It is the most important function of the teeth. The teeth are designed to perform this function.







## ② Appearance

- Well arranged clean teeth give nice appearance to the face.
- Teeth give support to the facial expressions.



## ③ Speech

- Teeth are important for clear pronunciation and for production of sound.

## ④ Growth of jaws

- The teeth play a role in the growth of the jaws in some periods of life.

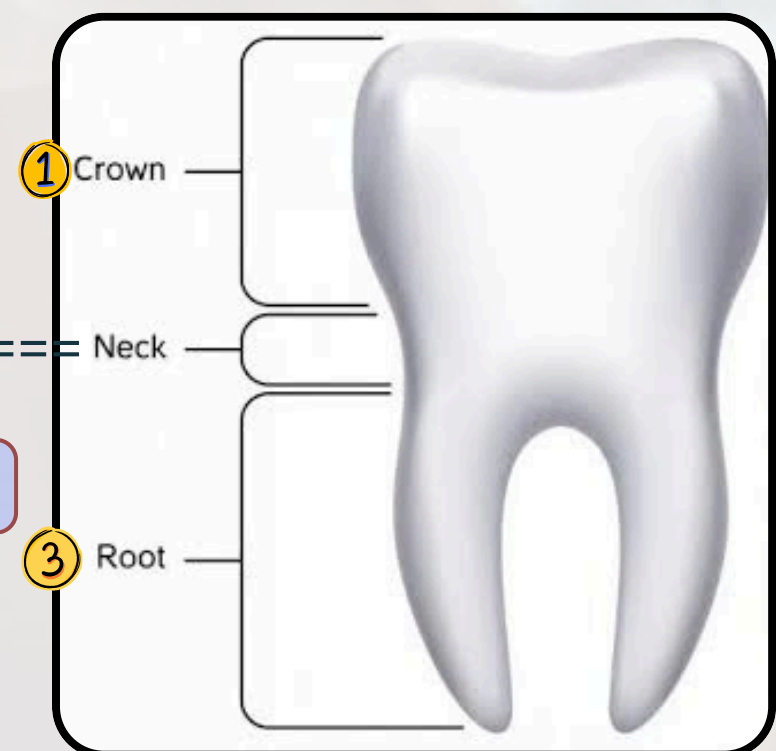
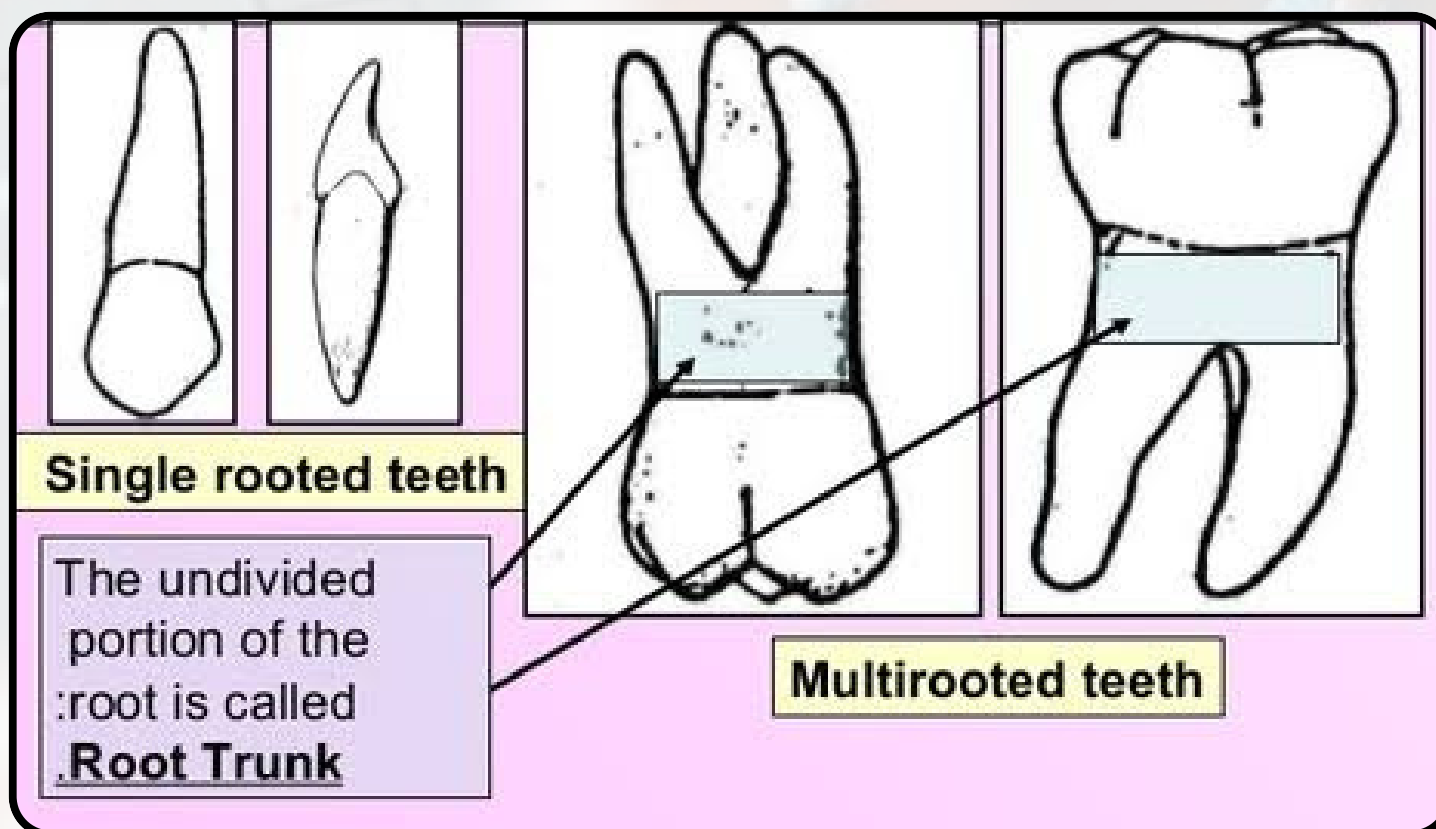
## Anatomy of the tooth

### ① Macro-anatomy of the tooth

- Each tooth has 3 anatomical parts:

② cervical line or cemento-enamel junction (CEJ). =====

Teeth may be divided according to the number of roots



### The root trunk

! is the part of the root of multirooted teeth next to the cervical line that has not split yet.

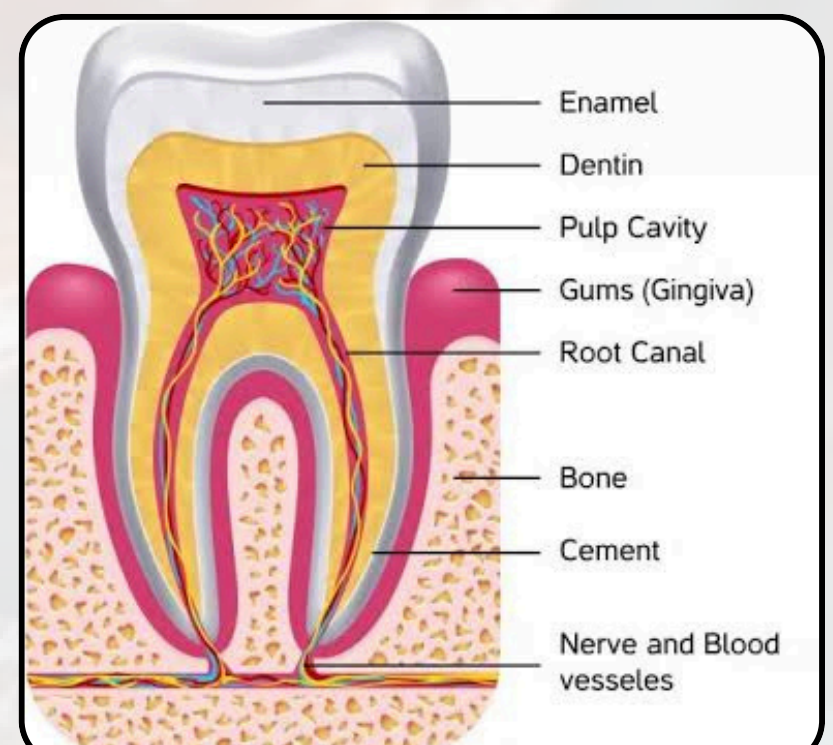
### ② Micro-anatomy of the tooth

3 calcified tissues :

1. Enamel
2. Dentin
3. Cementum

+ One soft specialized connective tissue :

1. dental Pulp.

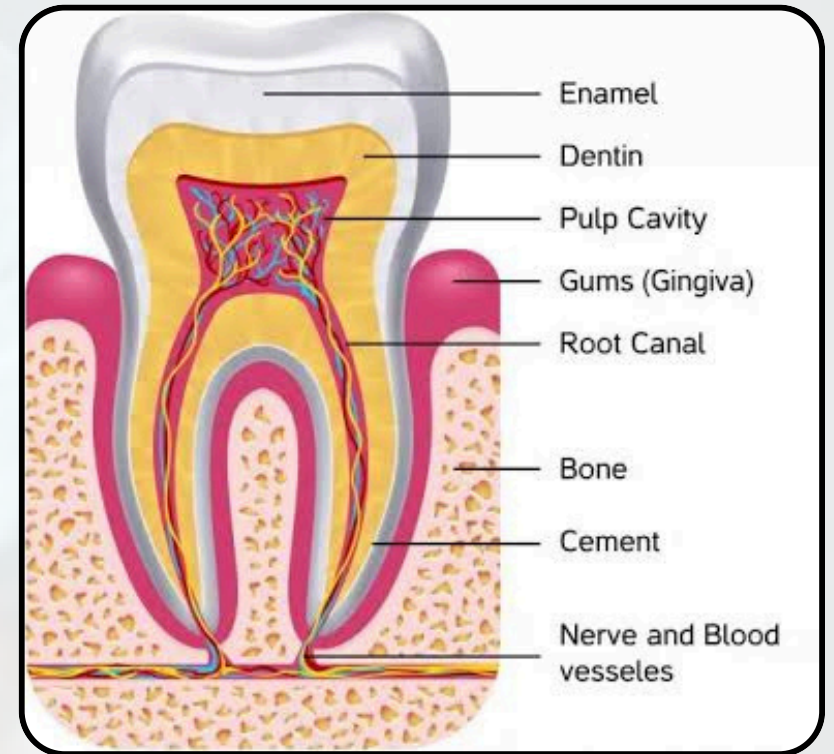






## Micro-anatomy of the tooth

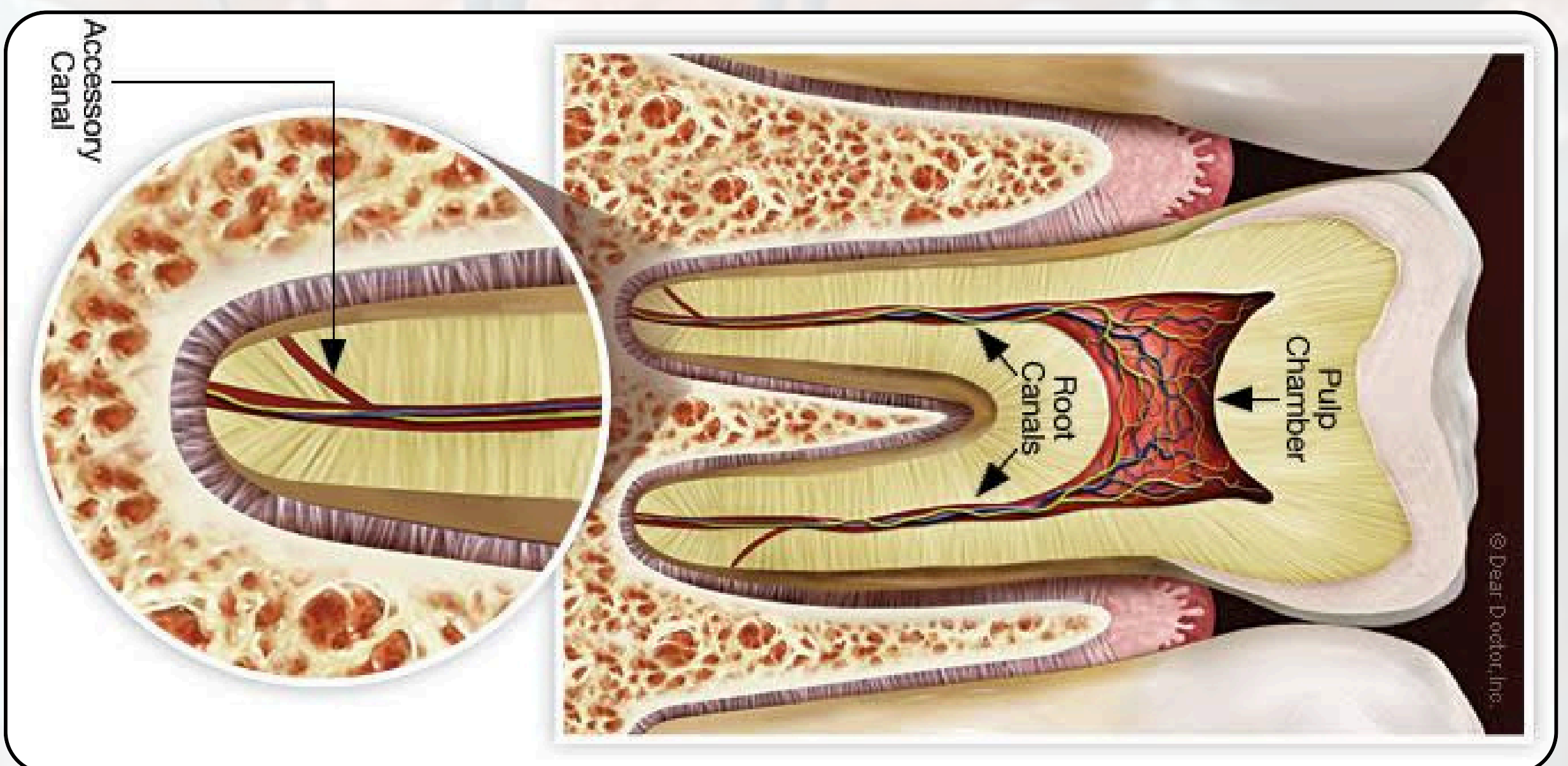
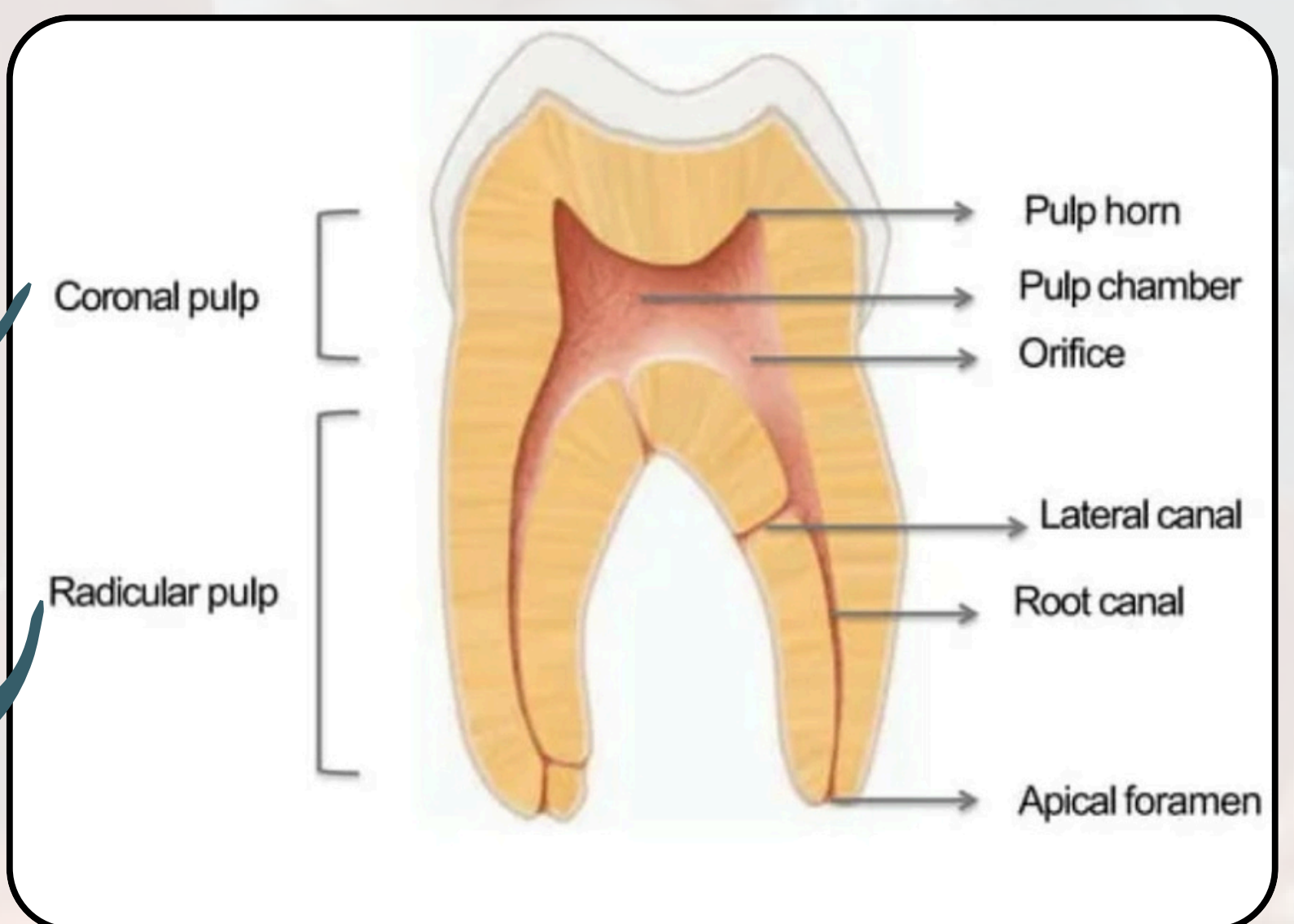
- ① **Enamel :** Covers the anatomical crown.
- ② **Cementum :** Covers the anatomical root.
- ③ **Dentin :** Surrounds The Pulp Cavity, Underlying The Enamel & The Cementum.
- ④ **Dental Pulp :** Soft specialized connective tissue, In The Pulp Cavity.



## Anatomy of Pulp and pulp cavity

- ① **Coronal pulp :** is that part present in the crown

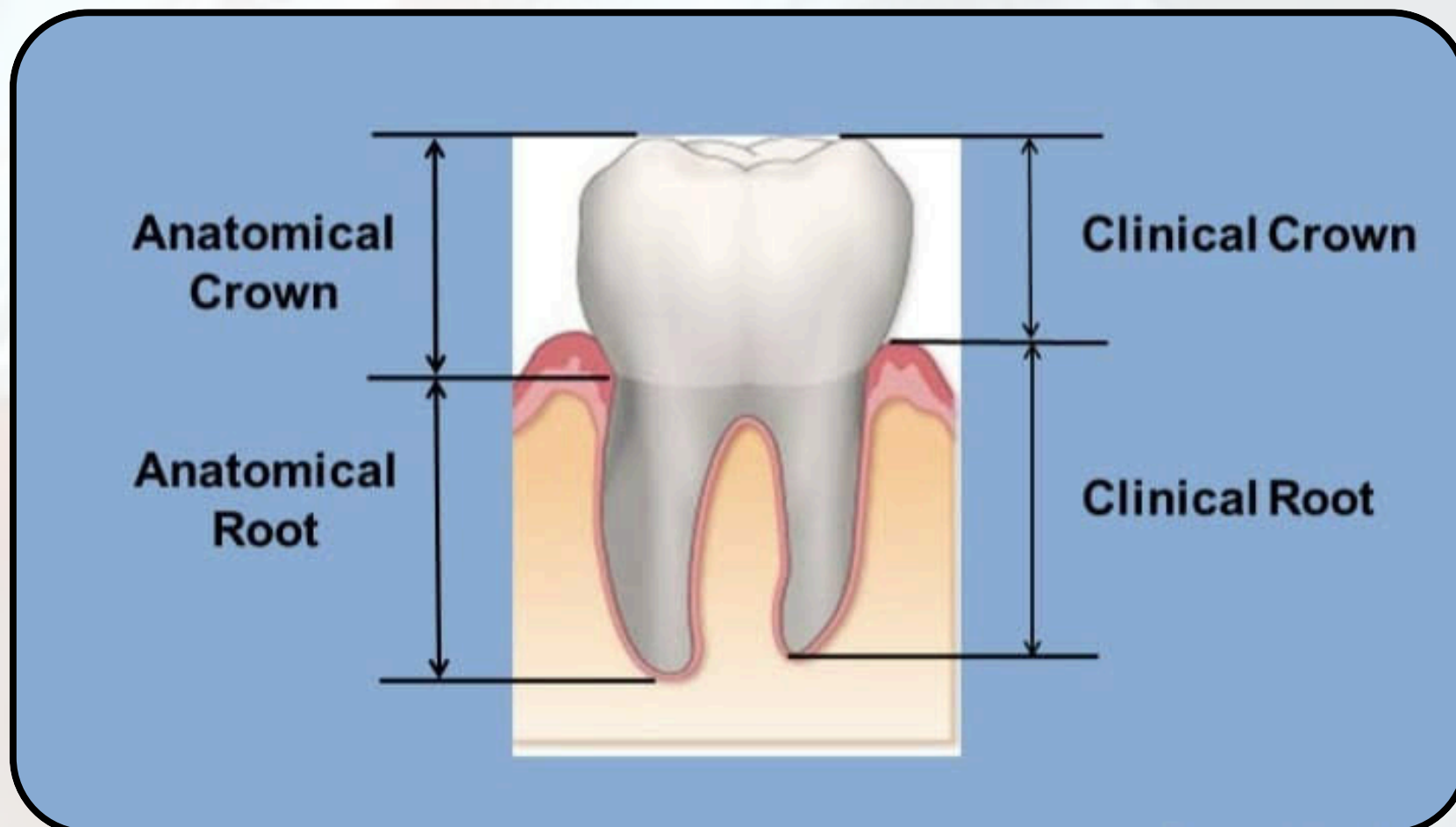
- ② **Radicular pulp:** is that part present in the root







## Anatomical & Clinical Crown



The anatomical crown is that part of the tooth normally covered by enamel.

The clinical crown refers to the amount of tooth visible in the oral cavity.

## Periodontium

The Periodontium : is defined as the supporting tissues of the teeth in the mouth.

It includes

### 1 2 Soft Tissues :

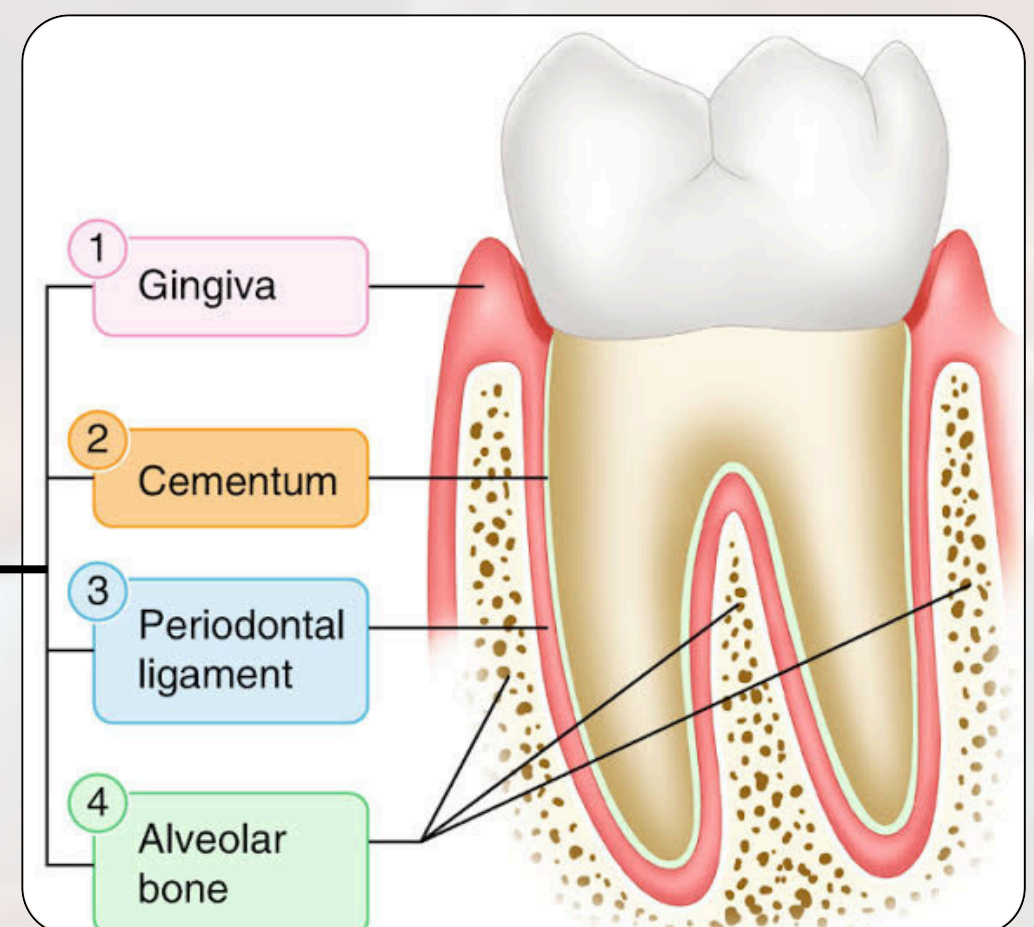
#### 1 - Gingiva :

- Is a pink strip of oral mucosa which surrounds the cervical zone of the teeth & is attached to it & to the coronal part of the alveolar bone.

#### 2 - Periodontal Ligament

- Fibrous ligament that attaches the tooth to the alveolar bone

tissue of  
Periodontium



### 1 2 Hard Tissues :

#### 1 - Cementum :

- Covers the anatomical root of the tooth

#### 2 - Alveolar Bone :

- Is the portion of the maxillary or mandibular bones that surrounds the roots of the teeth





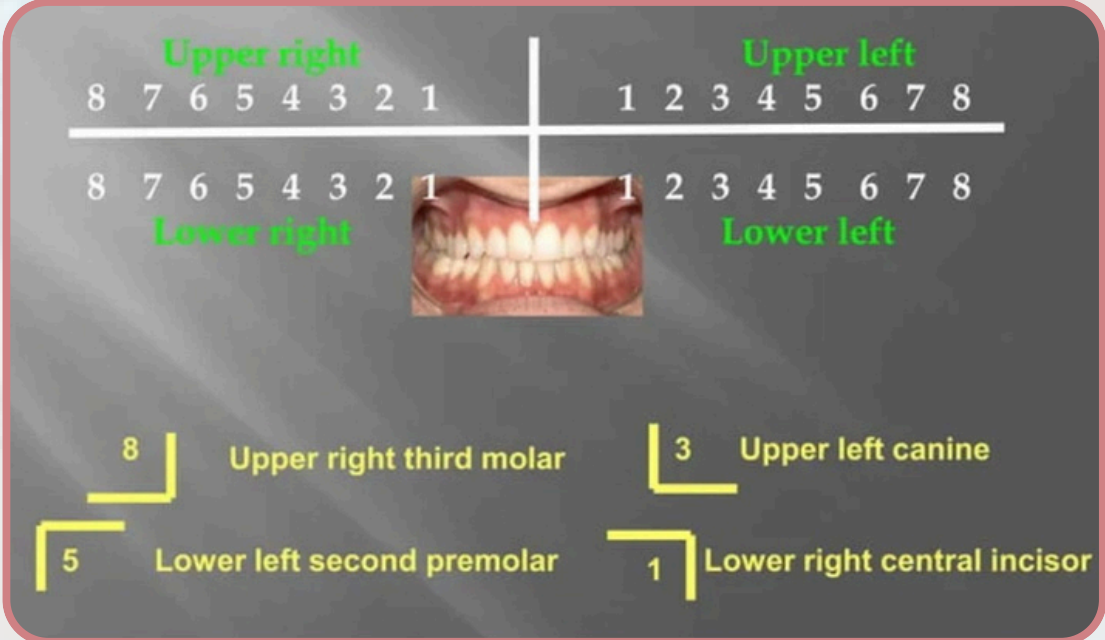
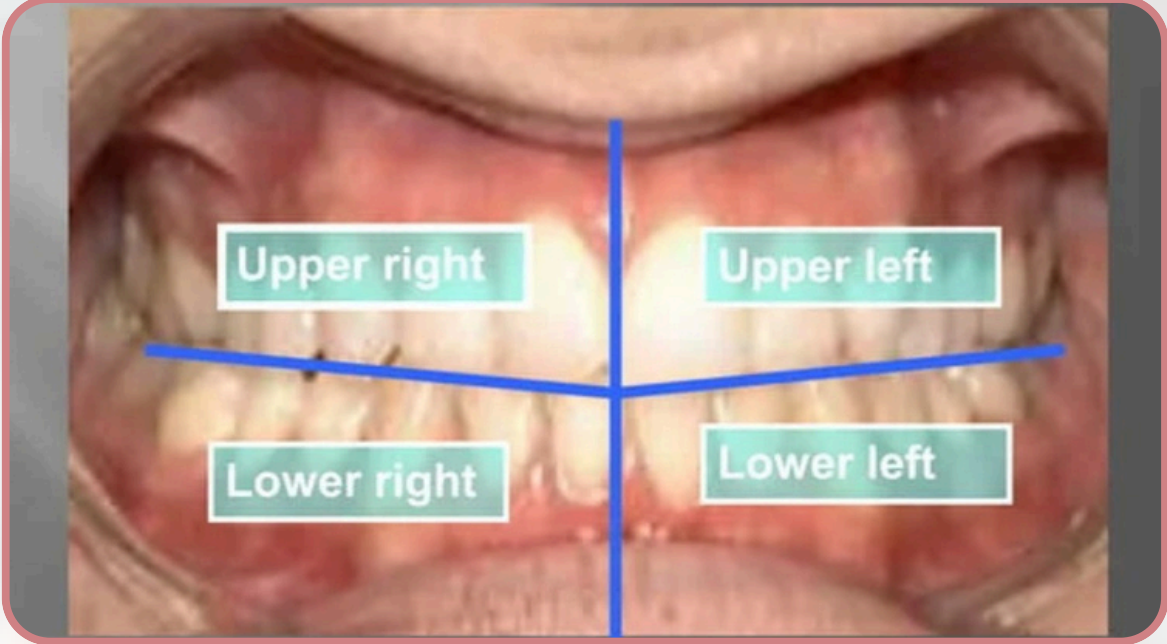
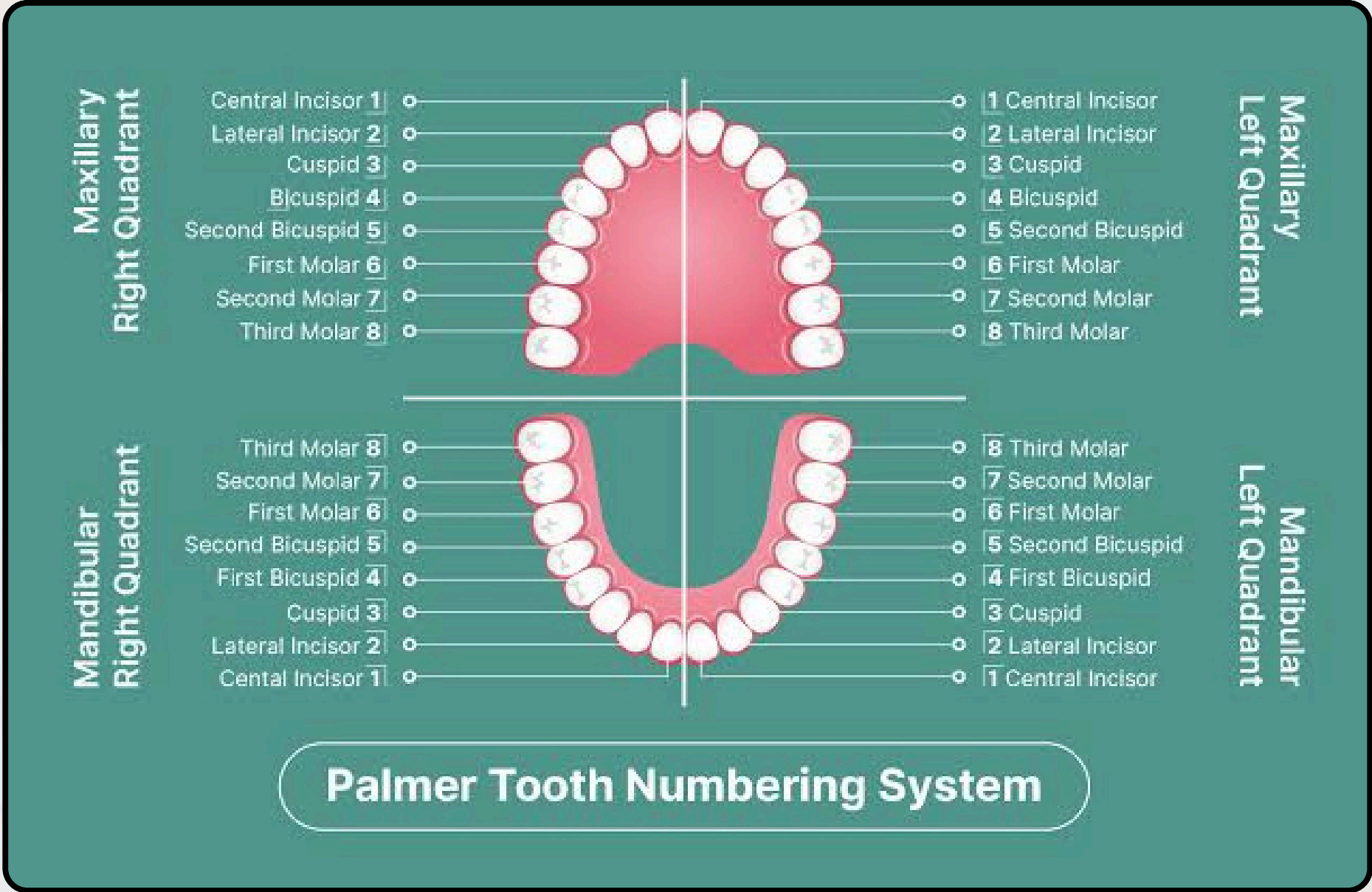


Tooth Numbering System

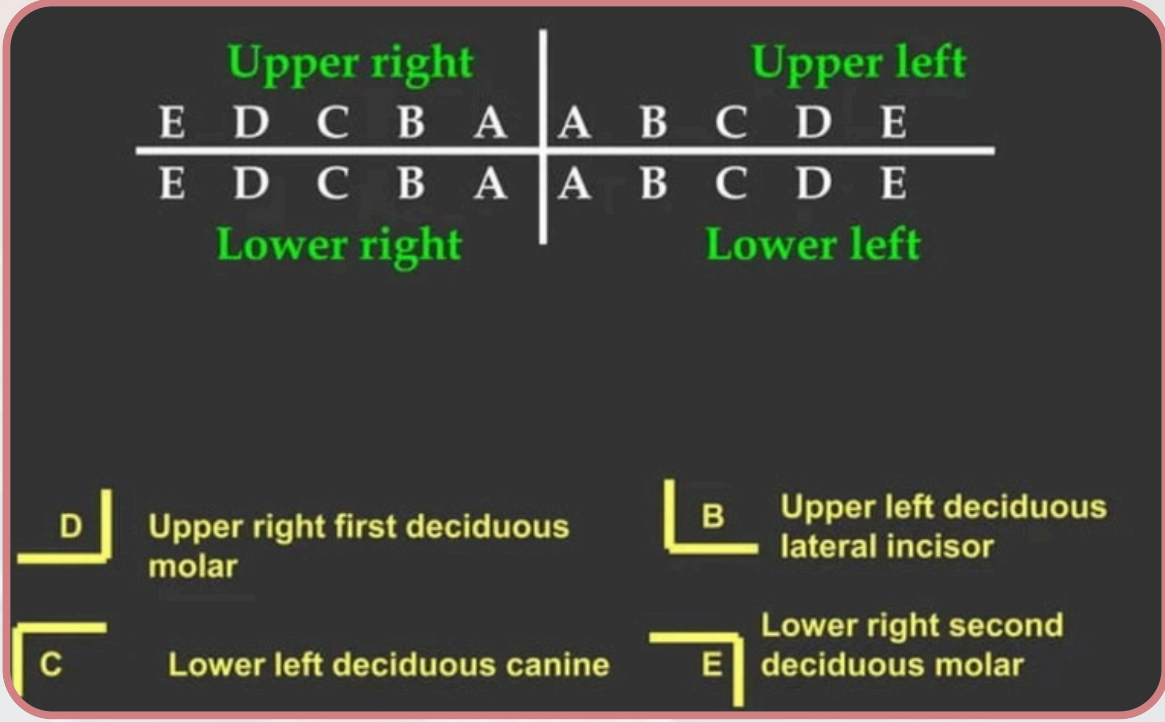
The systems that designed to identify the **type and location** of each tooth in each quadrant of the dental arches.  
They are used in clinical practice for recording data.

1 Palmer Notation System

The **permanent teeth** are numbered from 1-8 on each side from the midline.



The **deciduous teeth** are lettered from A-E on each side from the midline.





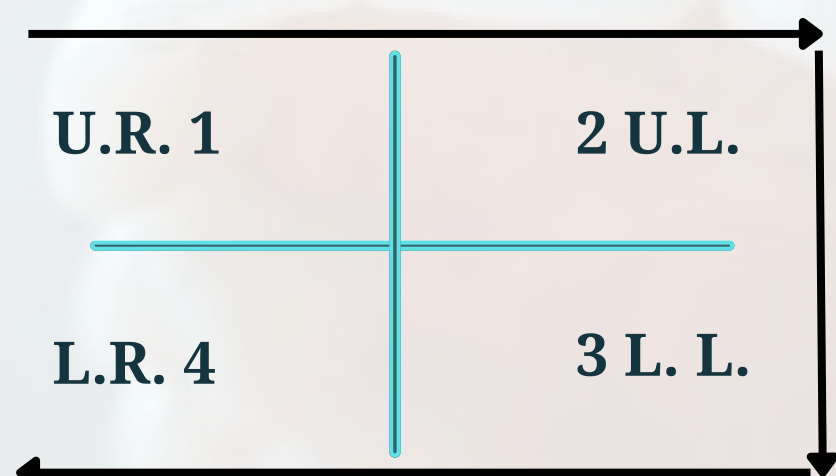


## 2 The international numbering system (The two digit system/ FDI)

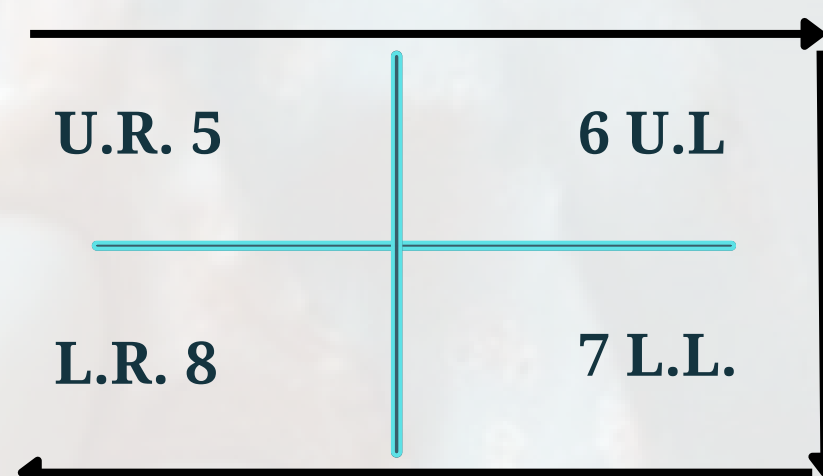
The teeth are designed by using two-digit systems :

- A - The **first digit** of the code is located at the left side of the number and indicates the **quadrant**.

### In the permanent dentition



### In the deciduous dentition



- B - The **second digit** is located at the right side of the number and indicates the **number of the tooth** in the quadrant.

**!** The two digits should be pronounced separately.

### Permanent teeth

18 17 16 15 14 13 12 11	21 22 23 24 25 26 27 28
48 47 46 45 44 43 42 41	31 32 33 34 35 36 37 38

### Deciduous teeth

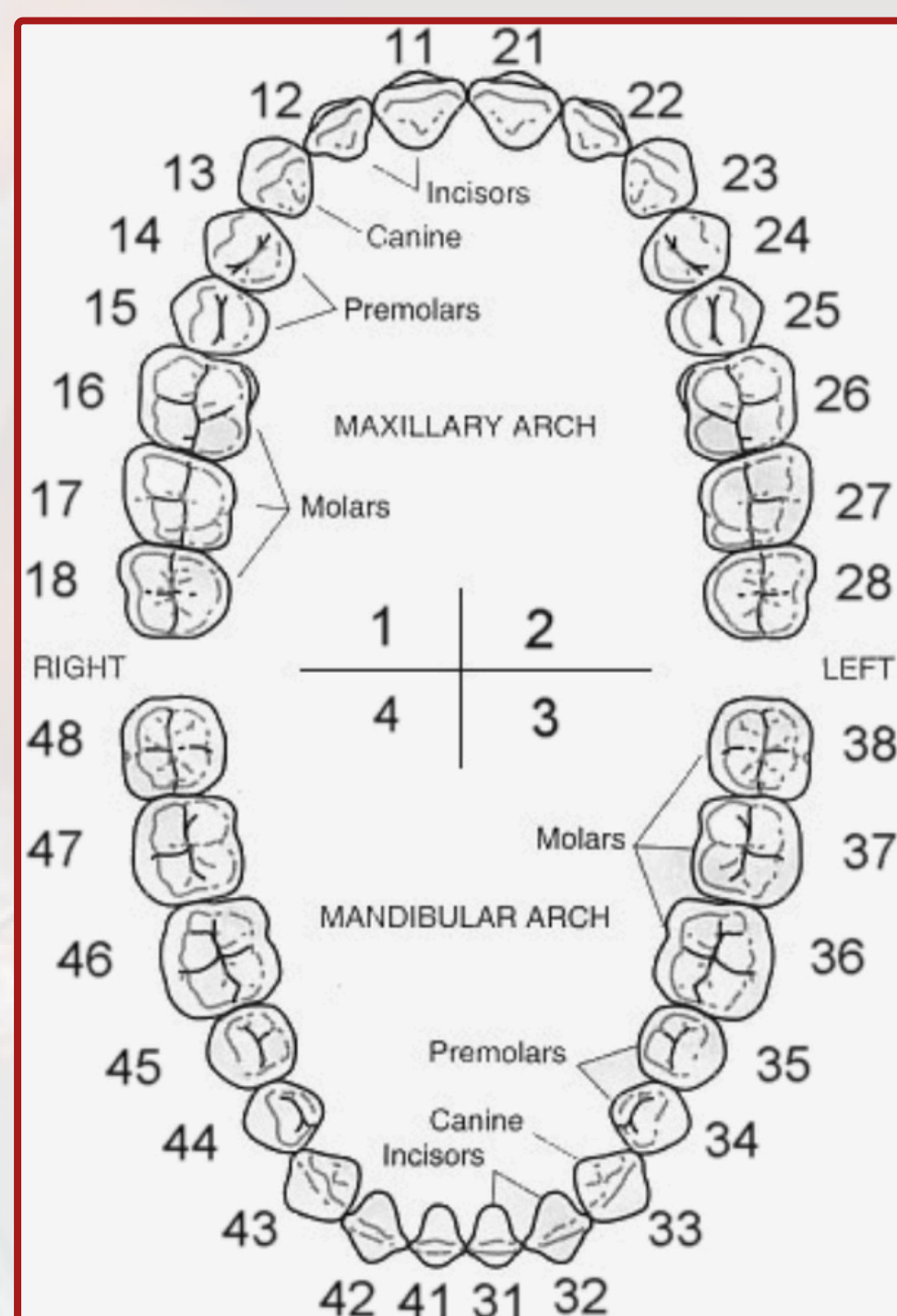
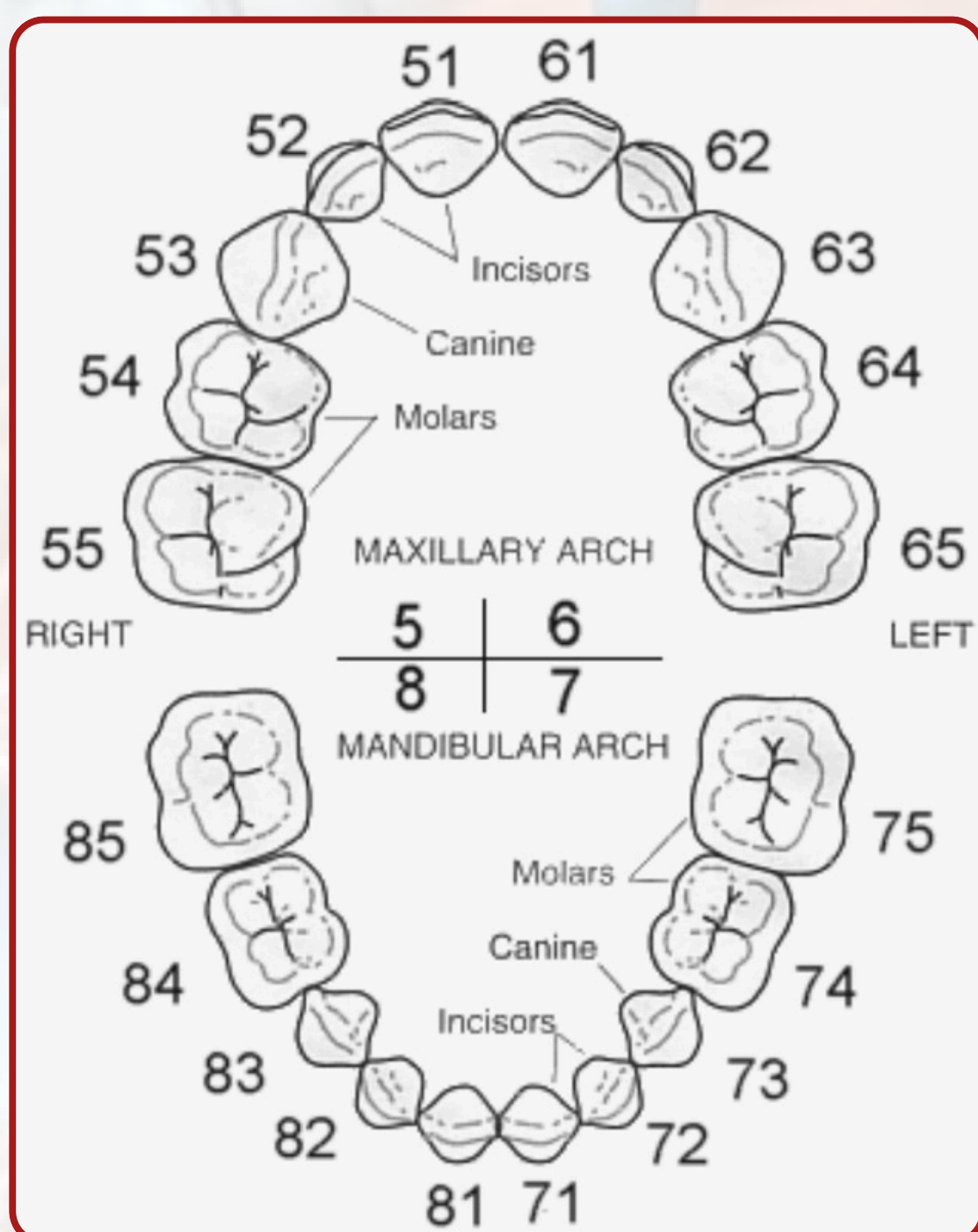
55 54 53 52 51	61 62 63 64 65
85 84 83 82 81	71 72 73 74 75

▼ 15 Upper right second premolar

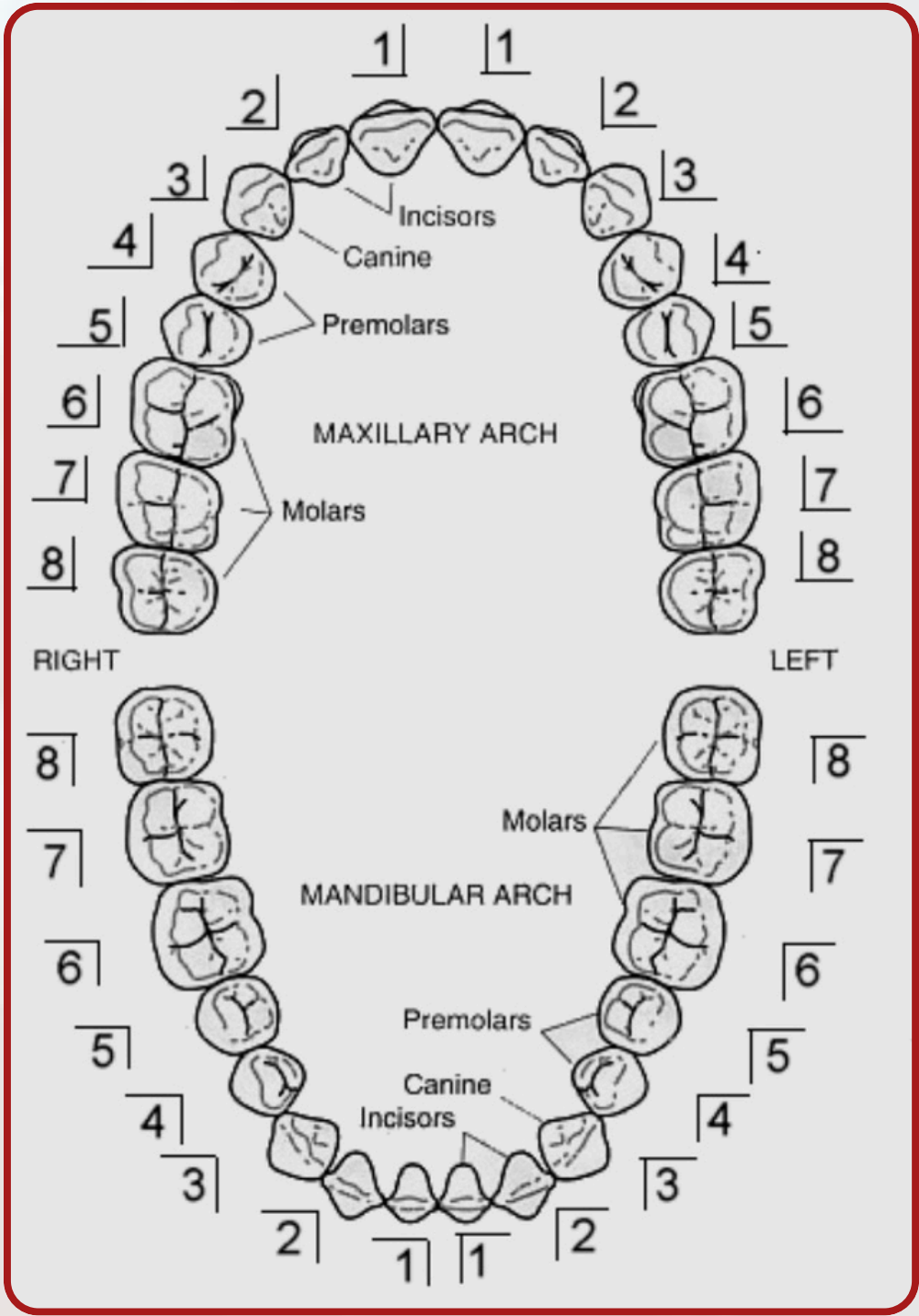
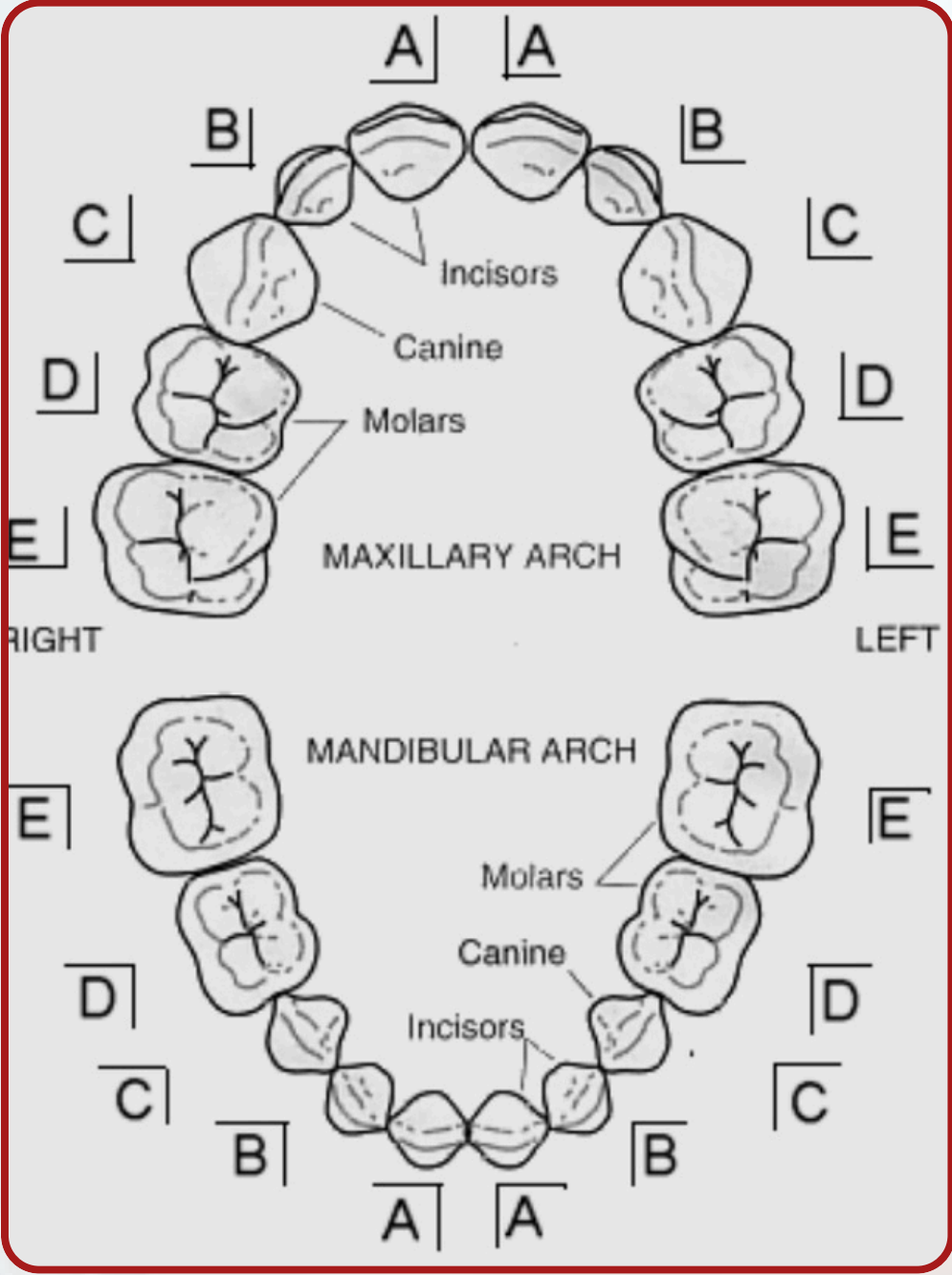
▼ 33 Lower left canine

▼ 55 Upper right second deciduous molar

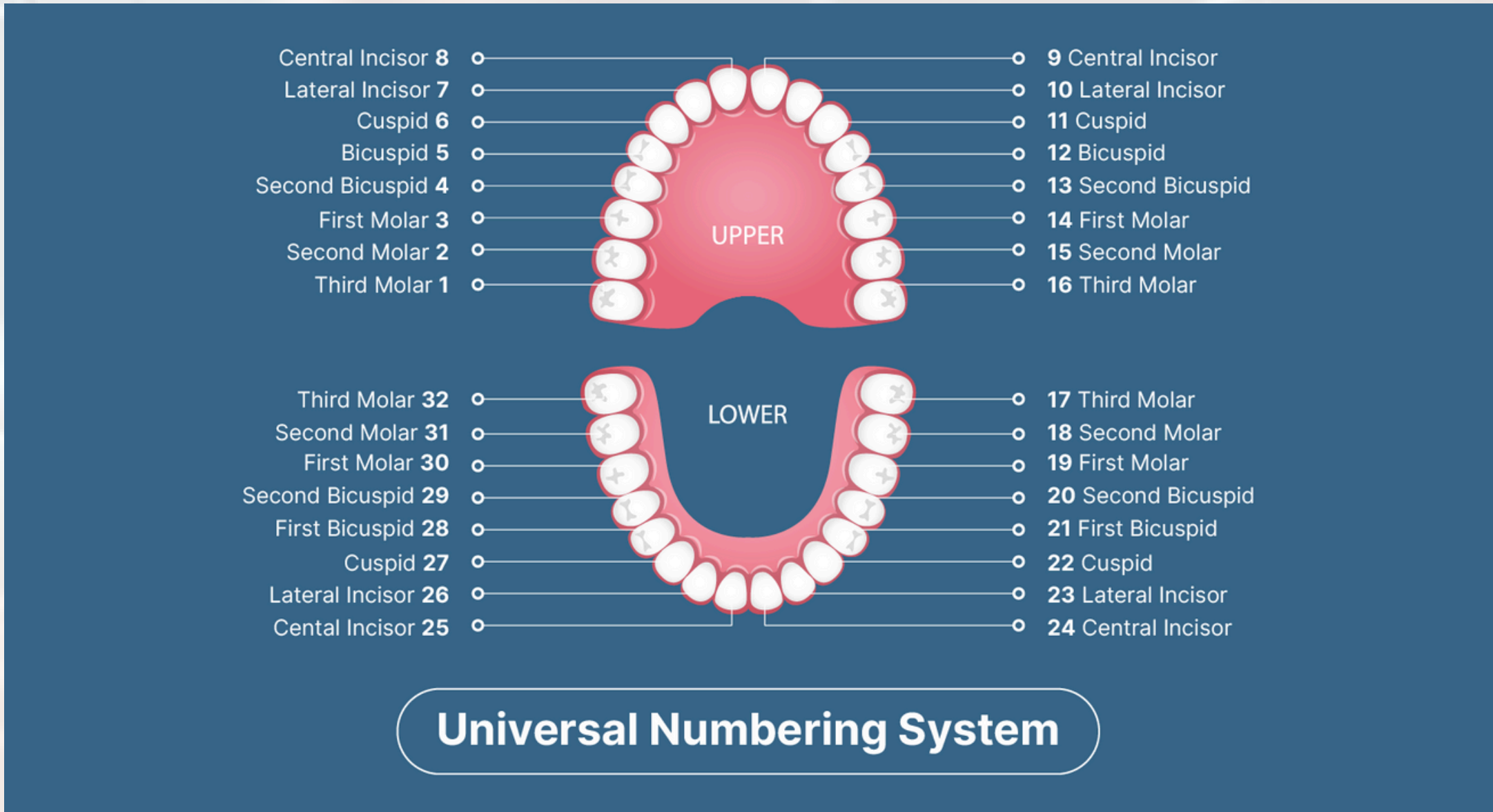
▼ 72 Lower left lateral deciduous incisor







**3 The universal system (American numbering system)**



The universal system of notation for the **primary dentition** uses uppercase letters for each of the primary teeth: For the maxillary teeth, beginning with the right second molar, letters A through J, and for the mandibular teeth, letters K through T, beginning with the left mandibular second molar.

for the **permanent dentition**, the maxillary teeth are numbered from 1 through 16, beginning with the right third molar. Beginning with the mandibular left third molar, the teeth are numbered 17 through 32.





The number is always preceded by the sign to designate that the system is used for universal system.

Permanent teeth (1 – 32)

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

▼ # 28 Lower right first premolar

▼ # 16 Upper left third molar

Deciduous teeth (1 – 20)

The number is preceded by # d

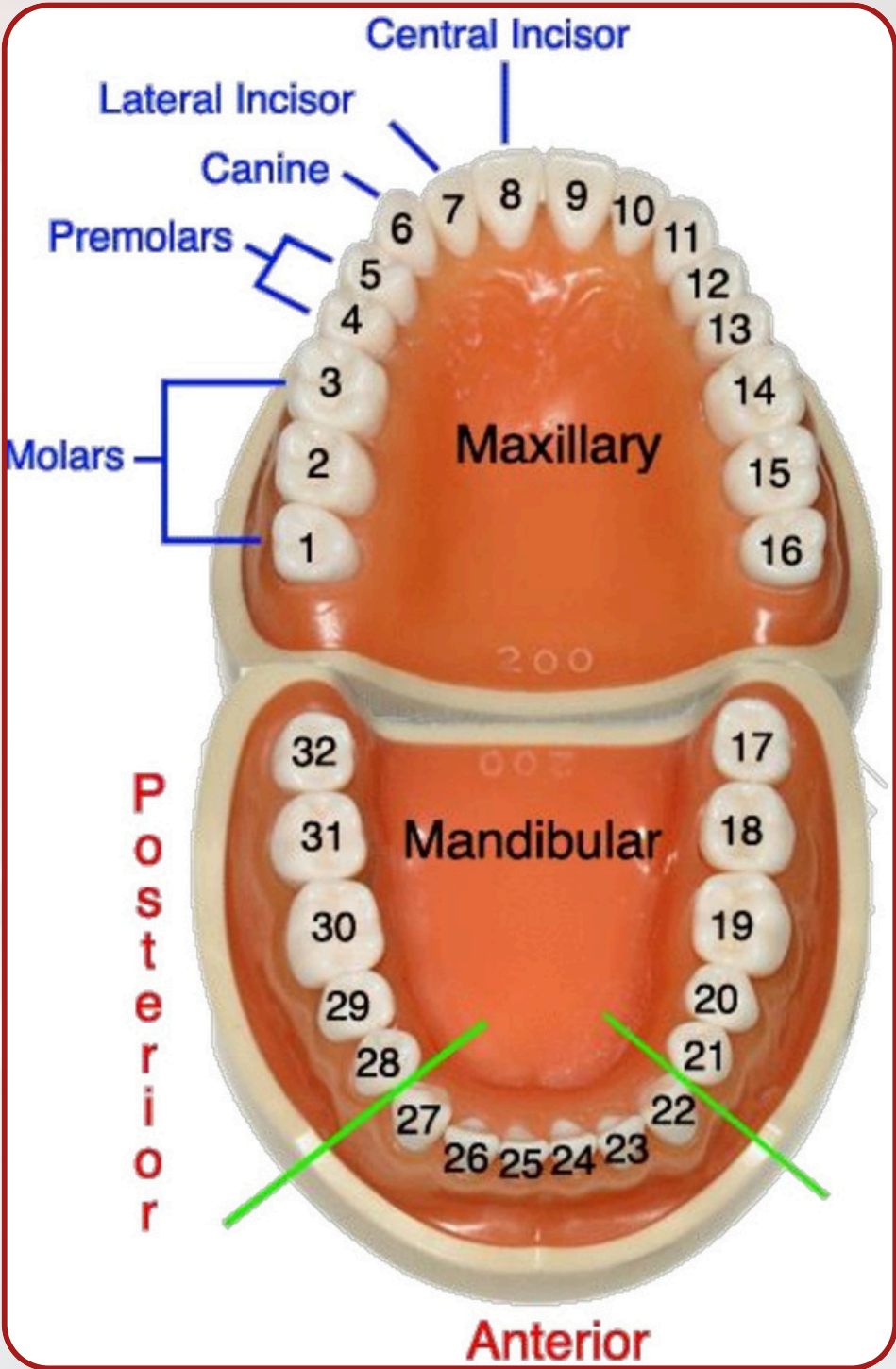
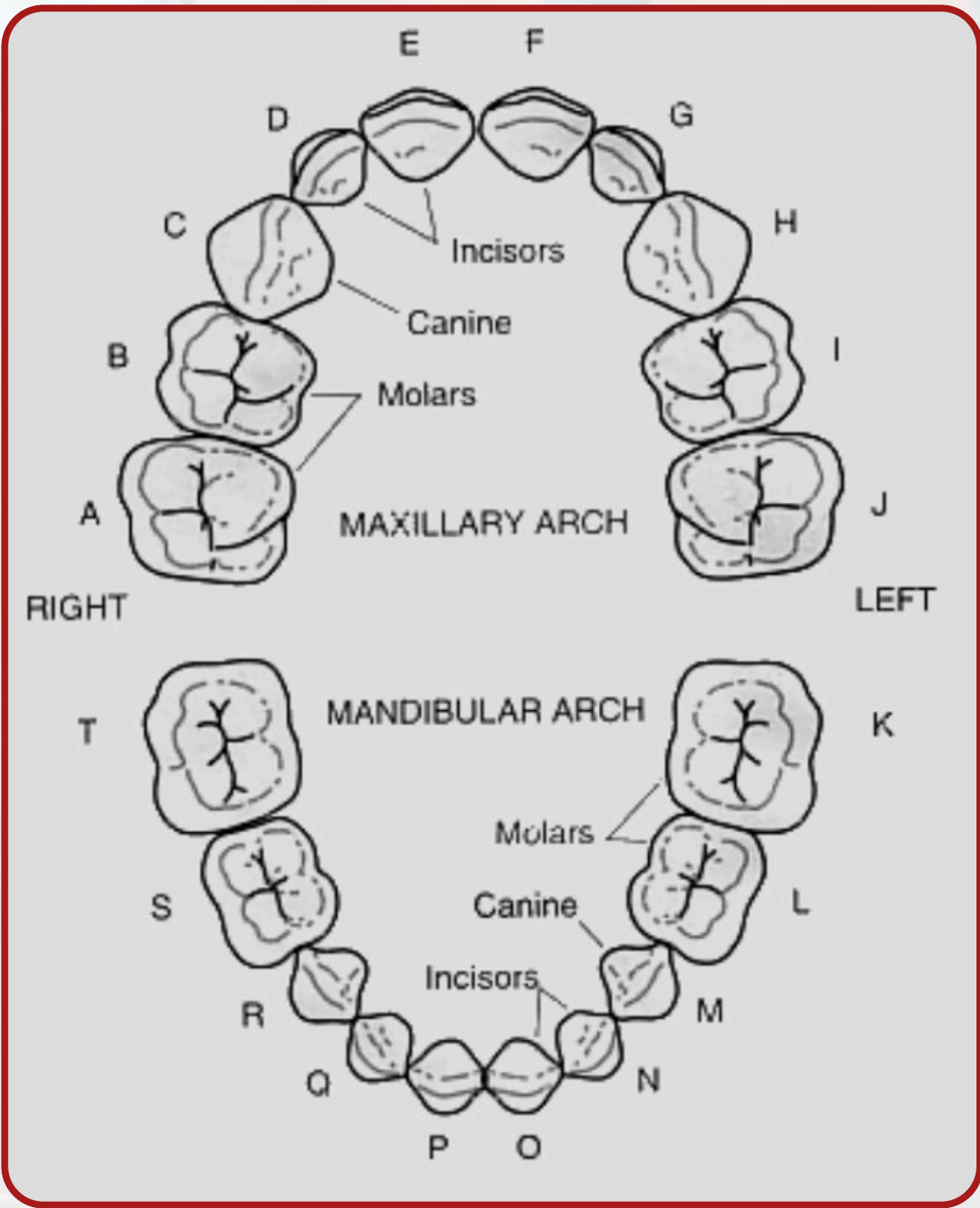
1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11

(A - T) The letter is preceded by # only

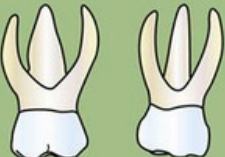

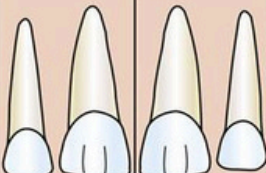

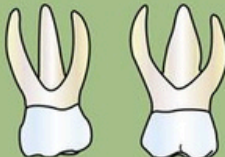
A	B	C	D	E	F	G	H	I	J
T	S	R	Q	P	O	N	M	L	K

▼ d # 14 Lower left deciduous lateral incisor



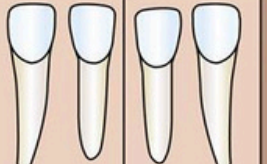


▼ # B Upper right deciduous first molar





Molars		Canine	Incisors				Canine	Molars		
Maxillary Arch										
										
I	A	B	C	D	E	F	G	H	I	J
II	55	54	53	52	51	61	62	63	64	65
III	<u>E</u>	<u>D</u>	<u>C</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>


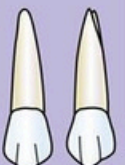

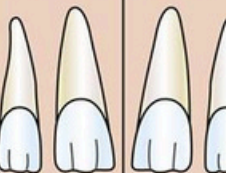

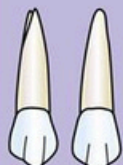

										
III	<u>E</u>	<u>D</u>	<u>C</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
II	85	84	83	82	81	71	72	73	74	75
I	T	S	R	Q	P	O	N	M	L	K


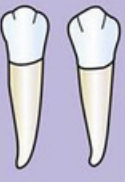

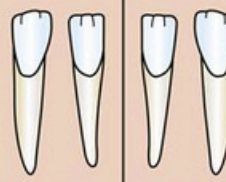



  

Mandibular Arch									
Right					Left				

I	Universal Tooth Designation System									
II	International Standards Organization Designation System									
III	Palmer Notation Method									

Molars			Premolars		Canine	Incisors		Canine	Premolars	Molars						
Maxillary Arch																
																
I	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
II	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
III	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8

III	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
II	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
I	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
																
Mandibular Arch																
Right									Left							

I Universal Tooth Designation System

II International Standards Organization Designation System

III Palmer Notation Method

A: Universal Tooth Designation System, International Standards Organization Designation System, and Palmer Notation Method for the primary teeth.

B: Universal Tooth Designation System, International Standards Organization Designation System, and Palmer Notation Method for the permanent teeth.

		Universal		Palmer Notation		The digit system	
		Right	Left	Right	Left	Right	Left
Permanent Dentition	Maxillary Teeth						
	Central incisor	8	9	1	1	11	21
	Lateral incisor	7	10	2	2	12	22
	Canine	6	11	3	3	13	23
	First premolar	5	12	4	4	14	24
	Second premolar	4	13	5	5	15	25
	First molar	3	14	6	6	16	26
	Second molar	2	15	7	7	17	27
Mandibular Teeth	Third molar	1	16	8	8	18	28
	Central incisor	25	24	1	1	41	31
	Lateral incisor	26	23	2	2	42	32
	Canine	27	22	3	3	43	33
	First premolar	28	21	4	4	44	34
	Second premolar	29	20	5	5	45	35
	First molar	30	19	6	6	46	36
	Second molar	31	18	7	7	47	37
	Third molar	32	17	8	8	48	38

		Universal		Palmer Notation		The digit system	
		Right	Left	Right	Left	Right	Left
Deciduous Dentition	Maxillary Teeth						
	Central incisor	E	F	A	A	51	61
	Lateral incisor	D	G	B	B	52	62
	Canine	C	H	C	C	53	63
	First molar	B	I	D	D	54	64
	Second molar	A	J	E	E	55	65
Mandibular Teeth	Central incisor	P	O	A	A	81	71
	Lateral incisor	Q	N	B	B	82	72
	Canine	R	M	C	C	83	73
	First molar	S	L	D	D	84	74
	Second molar	T	K	E	E	85	75