

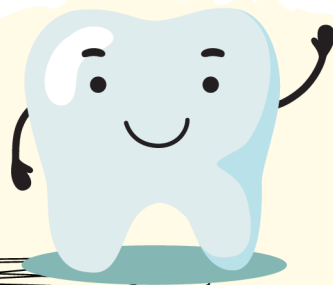
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ONLINE
DENTAL ACADEMY

Dental
anatomy
introduction



DENTAL
ANATOMY



DENTAL ANATOMY INTRODUCTION

Dental anatomy includes:

Surface anatomy of teeth; externally and internally, their arrangement in the dental arches, their relationship to each other and to the skull bone.

1- Lips:

There are two lips upper and lower.

The corner of the mouth where they meet is called commissure.

a. Nasolabial groove:

run diagonally downward on each side of the nostril toward the corner of the lip.

b. Labiomental groove:

run horizontally under the lower lip and emphasize the chin.

2- Gingiva

tissue that surrounds the cervical part of teeth.

3- Cheek

The lining of the inside of the cheeks is shiny with a white line called linea alba

4- Tongue:

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

5- floor of the mouth

6- Roof of the mouth {palate}:

anterior part is named as hard palate

The soft palate is sometimes redder than the hard palate. The junction between hard and soft palate is called vibrating line.

7-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. The teeth of lower dental arch are called lower or mandibular teeth.

- There are four quadrants in the entire oral cavity:

- a. Maxillary {upper} right quadrant.
- b. Mandibular {lower} right quadrant.
- c. Maxillary {upper} left quadrant.
- d. Mandibular {lower} left quadrant.

there are four types of teeth

I- Incisors

II- Canine {cuspid}

III- Premolars {bicuspid}

IV. Molars

- 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

1- The primary dentition:

- called the deciduous dentition or the one that is shed or exfoliate.
- This begins at 6 months and ends at 6 years.
- The eruption of primary teeth begins at 6 months
- 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.

2- 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

3- The permanent dentition:

- called the secondary or succedaneous dentition
- This dentition begins at approximately 12 years and persists throughout the life span 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.

Tooth Anatomy

Macro-anatomy of the tooth:

1. Crown

Anatomical crown:

It is that part of the tooth covered by enamel.

Clinical crown:

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

Clinical crown may be:

- Shorter than the anatomical crown; in case of newly erupted tooth (Fig. 7a).
- Longer than the anatomical crown in case of gingival recession (Fig. 7b).

2. Root

- **Anatomical root:** It is that part of the tooth which is covered by cementum.
- **Clinical root:** It is that part of the tooth which is under the gingiva,
- Teeth may have one or more roots. single rooted teeth and multi-rooted teeth.

3- Neck

It is the junction between the anatomic crown and the anatomic root. It is named cervical line.

Micro-anatomy (structure) of tooth:

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 to the periodontal ligament.

3-Dentin: It is a hard yellowish tissue which forms the main bulk of the tooth. It is found under enamel coronally and under cementum in the root. It surrounds the pulp.

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.

the pulp cavity is formed of two parts:

a- The pulp chamber:

in the center of the anatomical crown prolongates into the cusps forming pulp horns.

b- Root canal:

It is located in the root. Root canal ends at the apex of the root by an apical foramen.

The periodontium

It is the investing and supporting attachment system of teeth.

It consists of:

a- Two soft tissues: gingiva and periodontal ligament.

b- Two hard tissues: cementum and alveolar bone.

- **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**.

Junctions of the tooth tissues:

1- Cemento-enamel junction: {see 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.

Functions of teeth:

1- Mastication:

This is the most important function of teeth.

- **Incisors:** for cutting or incising food.
- **Canine:** for piercing or tearing food.
- **Premolars:** have the function of tearing and grinding of food.
- **Molars:** are suitable for grinding food.

2- Appearance

3- Speech

4- Growth of jaws

Surfaces of the teeth:

1. The facial surface:

- It is the surface of a tooth facing the lips or cheeks.
 - a. Labial surface: the surface of an anterior tooth facing the lips.
 - b. Buccal surface: the surface of a posterior tooth facing the cheeks.

2. The 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.

3. The mesial surface:

it is the surface of tooth close to the midline.

4. The distal surface:

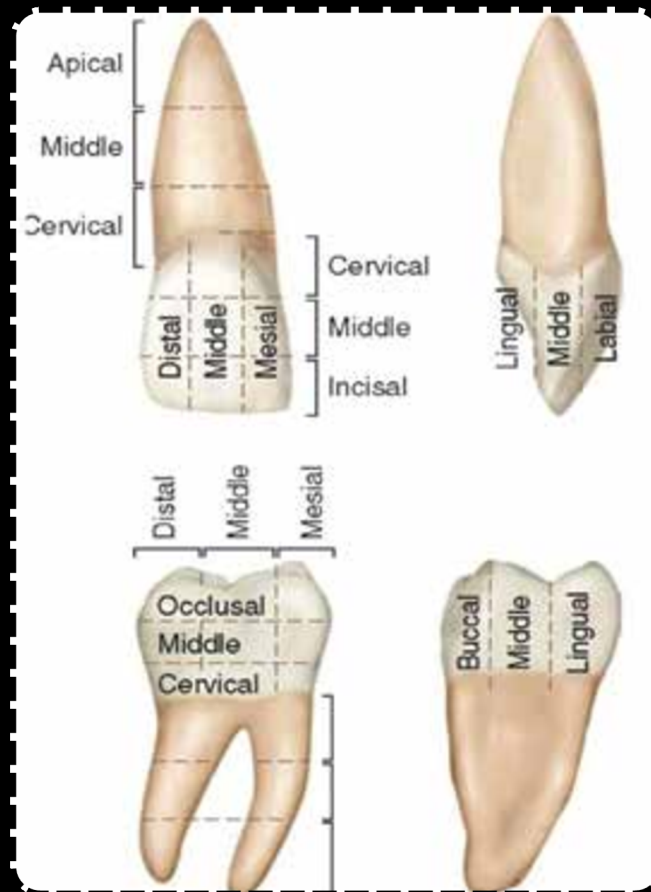
it is the surface of tooth away from the midline.

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

5. The 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.

Division of tooth surfaces:



-Line angles:

It is formed by the junction of two surfaces of the crown

Line angles of anterior teeth:

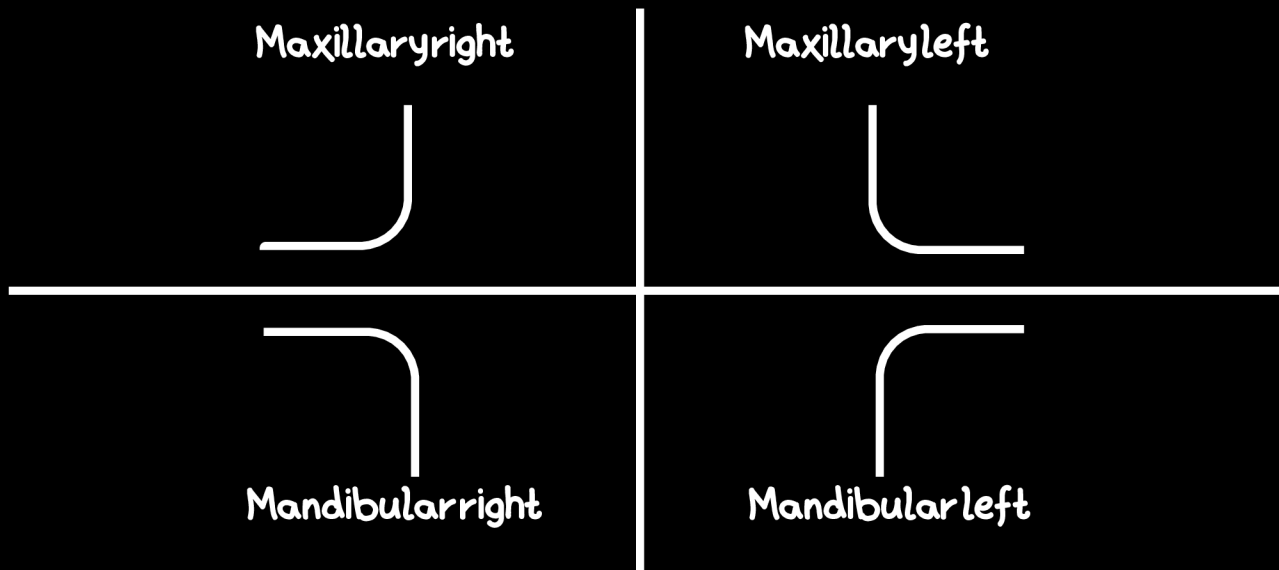
The anterior teeth have fewer line angles because the meeting of the mesial and distal line with the incisal ridge are rounded, so the mesio-incisal and disto-incisal line angles are practically not exist.

-Point angles:

- Point angle is formed by the junction of three surfaces. There are 4 point angles for both anterior and posterior teeth.

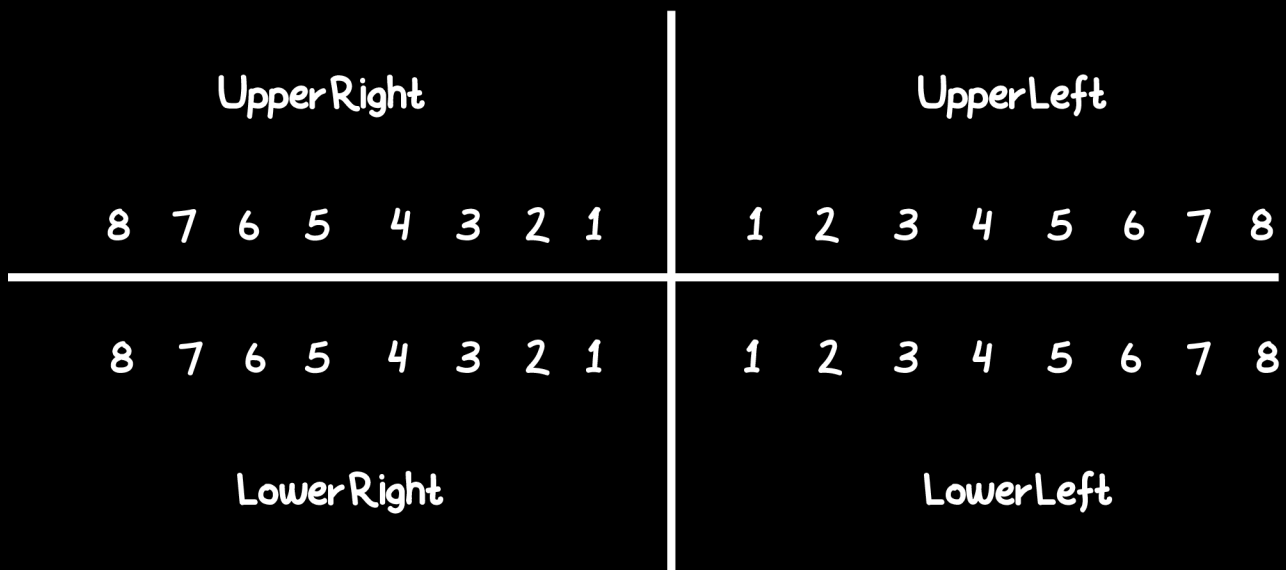
Tooth identification systems

1-Palmer notation system:

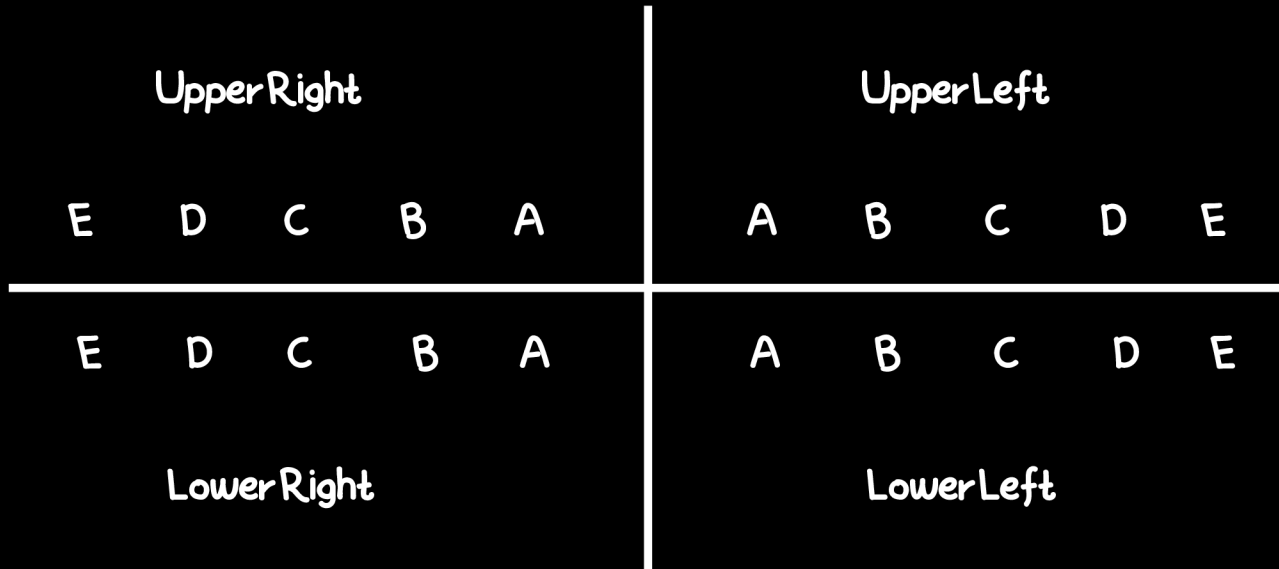


- The permanent teeth are numbered from 1-8 on each side from the midline as follows:

1-Central incisor 2-Lateral incisor 3-Canine 4-First premolar
5-Second premolar 6-First molar 7-Second molar 8-Third molar



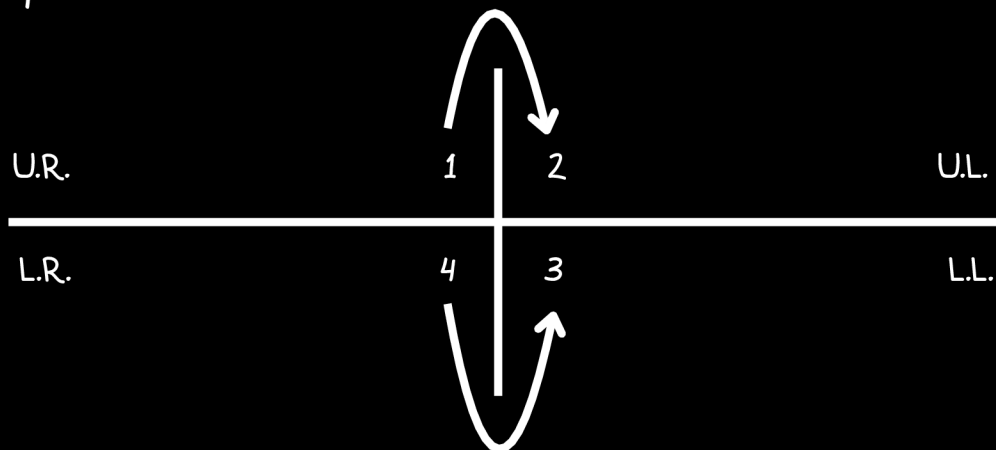
The deciduous teeth are lettered from A–E on each side from the midline as follows:



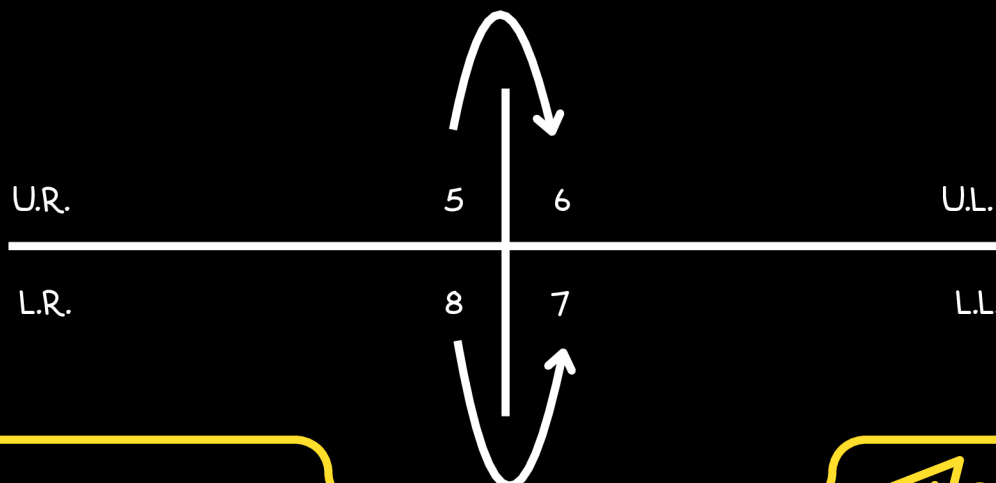
2- The international numbering system (the two digit system)

a) The first digit

- 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. For deciduous dentition, digits from 5 to 8 is used. In the permanent dentition.



In the deciduous dentition



b) The second digit

- It indicates 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 be pronounced separately.

permanent teeth

Upper Right								Upper Left							
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
Lower Right								Lower Left							

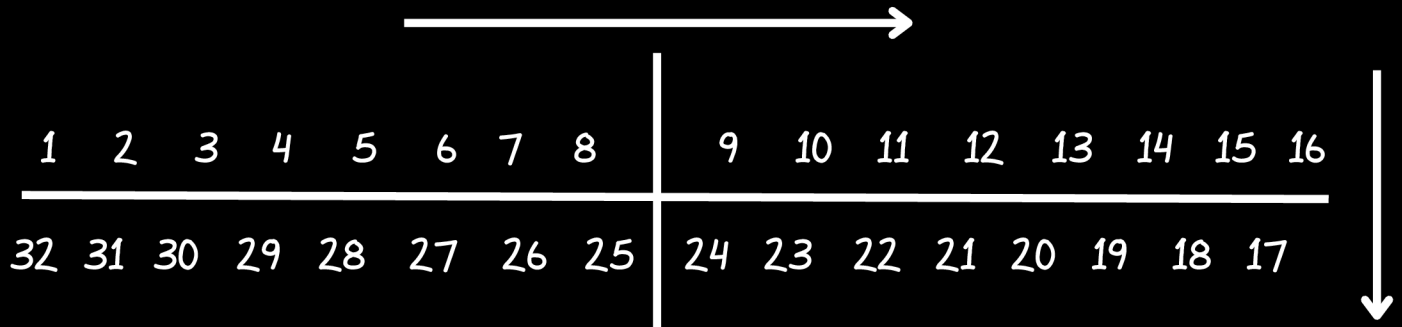
deciduous teeth

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

3- The universal numbering system {American numbering system}:

The numbers in this system is always preceded by the sign #

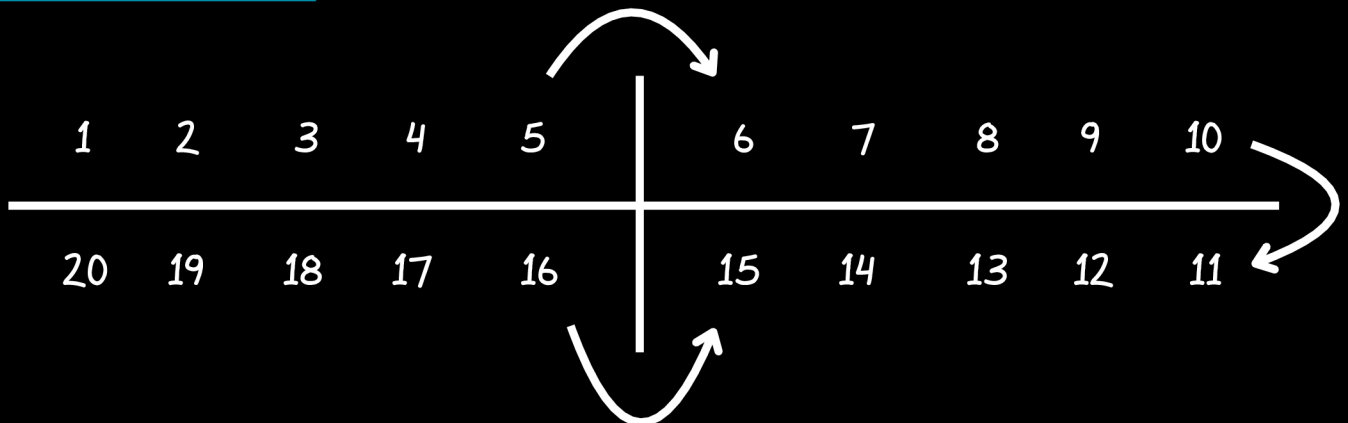
Permanent teeth {1-32}



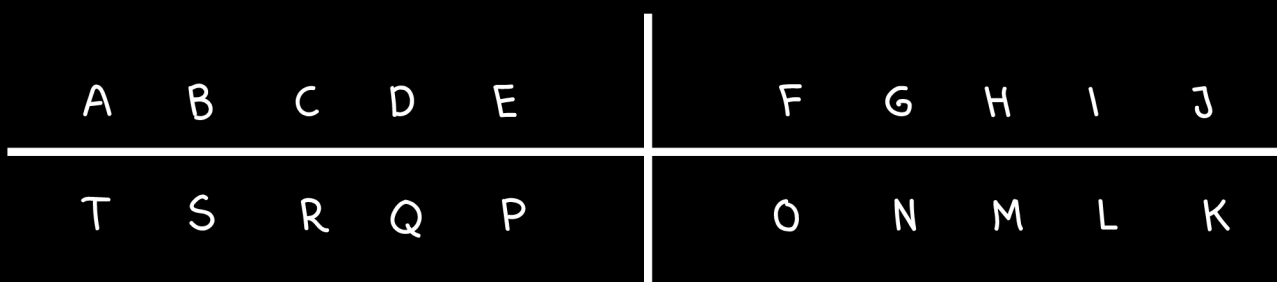
b) For deciduous teeth

- Numbers from 1 to 20 are used with adding a small {d}

Deciduous teeth {1-20}



Deciduous teeth {A-T}



Anatomical Landmarks of The Tooth Crown

Crown Elevations

A) Lobe:

- the primary centers of calcification, Each tooth begins to develop from four lobes, except lower 5 & lower 6.

The mature forms of lobes are:

1-Mamelons:

are 3 small rounded projections present in the incisal third of newly erupted incisors. Mamelons wear down due to normal use into flat incisal edge.

2-Cusp:

elevation nearly pyramidal in shape found on the occlusal surface of posterior teeth and the incisal part of canines.

3-Cingulum:

It is a rounded prominence on the cervical third of the lingual surface of the crown of anterior teeth.

B) Tubercle:

is commonly found on the palatal surface of upper 6 and upper E (cusp of Carabelli)

C) Ridge:

It is a linear elevation on the different surfaces of the crown.

I) Ridges on the facial surface

1-Labial ridge

2-Buccal ridge

3-Cervical ridge

II) Ridges on the lingual surface

1-Incisal ridge

2-Lingual ridge

3-cuspridge

4-marginal ridge

III) Ridges on the occlusal surface

1-marginal ridge

2-triangular ridge

3-transverse ridge

4-oblique ridge

Crown Depressions:

1- Developmental groove:

linear depression represents the site of union of primary lobes.

2- Supplemental grooves:

are short, irregular linear depressions found usually on the occlusal surface and do not represent union lobes.

3- Fissure:

It is a linear depression found in the bottom of developmental groove as a result of incomplete union of the primary lobes.

4- Fossa:

It is small depression found in both anterior teeth and posterior teeth.

a- Lingual fossa

b- Central fossa

c- Mesial and distal triangular fossa

5- Sulcus:

It is a broad depression or valley found between the inclined planes of triangular ridges

6- Pit:

a small pinpoint depression present at the junction or at the end of the developmental grooves.

- **A fault pit** usually develops as a result of incomplete formation of enamel.

Self-cleansing surfaces:

These are the surfaces of teeth which are cleaned by normal functional action of the tongue and cheeks and mouth fluids, facial, lingual and incisal surfaces.

Crypt:

it is bony space in the alveolar bone containing the developing unerupted tooth.

Socket:

it is bony space in the alveolar bone containing the roots of erupted tooth.

LIFE HISTORY OF THE TOOTH

1-Soft growth stage:

- The deciduous teeth start their development inside the jaw before birth.

2-Calcification:

- The mineralized salts, mostly calcium, from blood will be deposited in the soft tissue in form of small spherical bodies, then they will enlarge to form primary lobes which fuse together to form the calcified dental tissues.

3-Eruption:

- The eruption of the mandibular teeth precedes the maxillary teeth.
- The teeth in both sides of the jaw erupt at the same time.
- Teeth erupting in girls earlier than boys.
- The first tooth in the oral cavity when its crown is completely formed as well as a third of the root.

4-Attrition:

- It is the physiological loss of the hard dental structure due to the continuous friction of the teeth.

5-Shedding of the deciduous teeth

Shedding: is the physiological loss of the deciduous teeth and replaced by their permanent successors.

- Loss of the permanent or deciduous teeth, before their time shedding that is considered pathological loss of teeth.