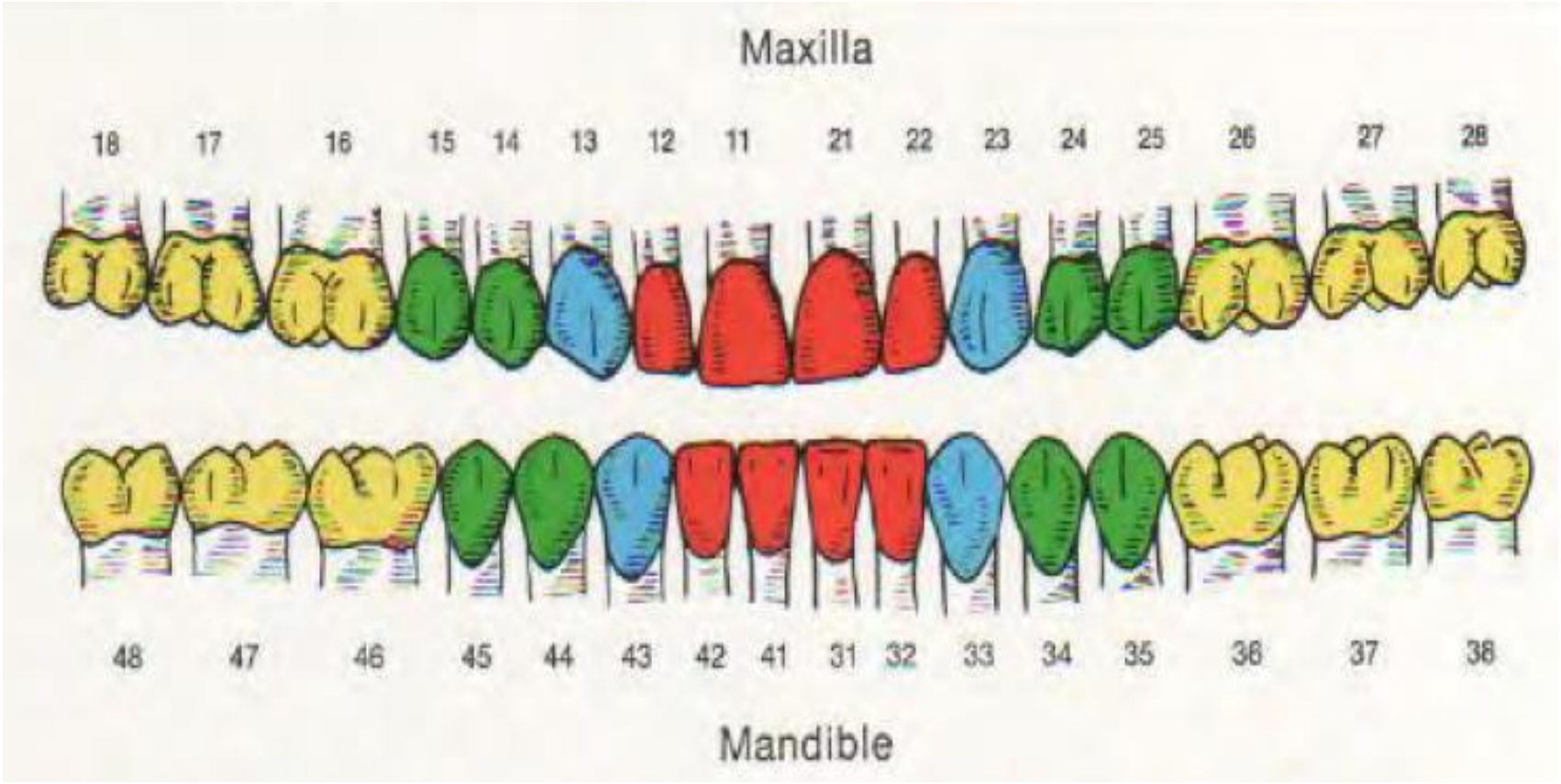
MANDIBULAR MOLARS

Molars


Maxilla
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
Mandible

FUNCTIONS OF MOLARS

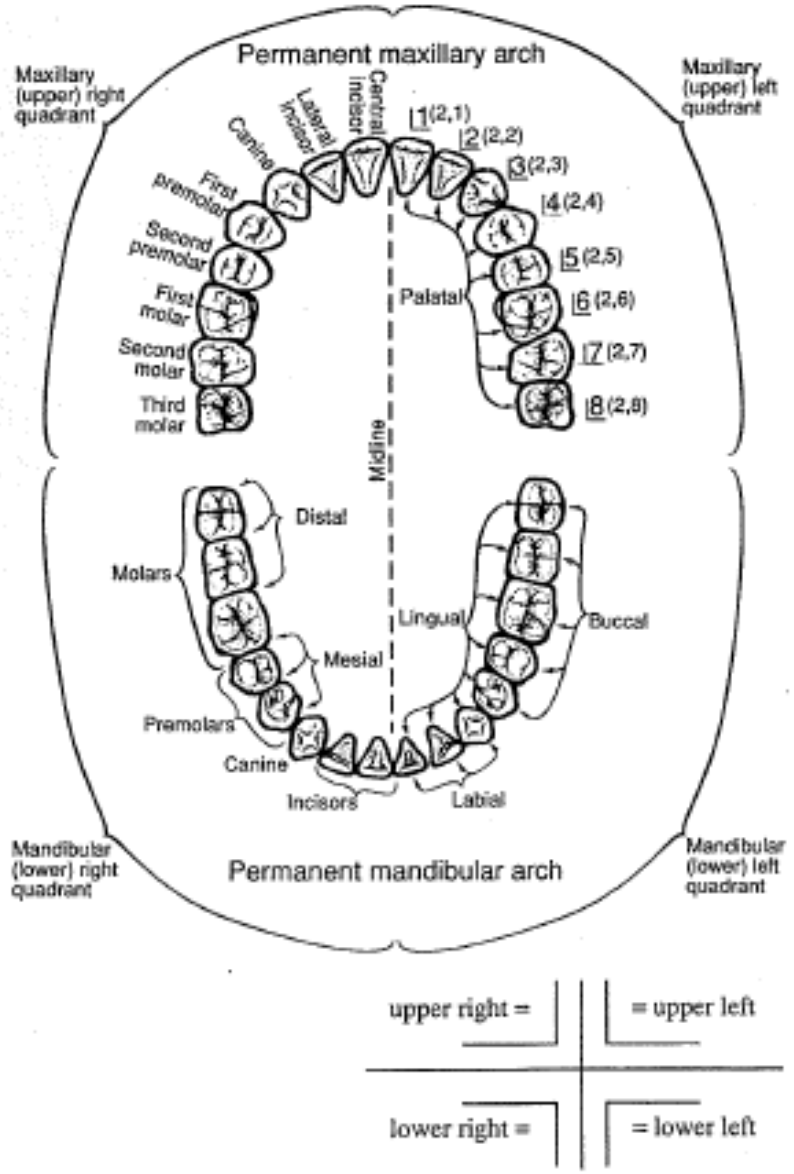
a) Play a major role in the mastication of food (chewing and grinding)
b) Most important in maintaining the vertical dimension of the face (resulting in a protruding chin and a prematurely aged appearance)

C) Important in maintaining continuity within the dental arches, thus keeping other teeth in proper alignment.

D) A minor role in aesthetics or keeping the cheeks normally full or supported.

You may have seen someone who has lost all 12 molars (six upper and six lower) and has sunken cheeks.

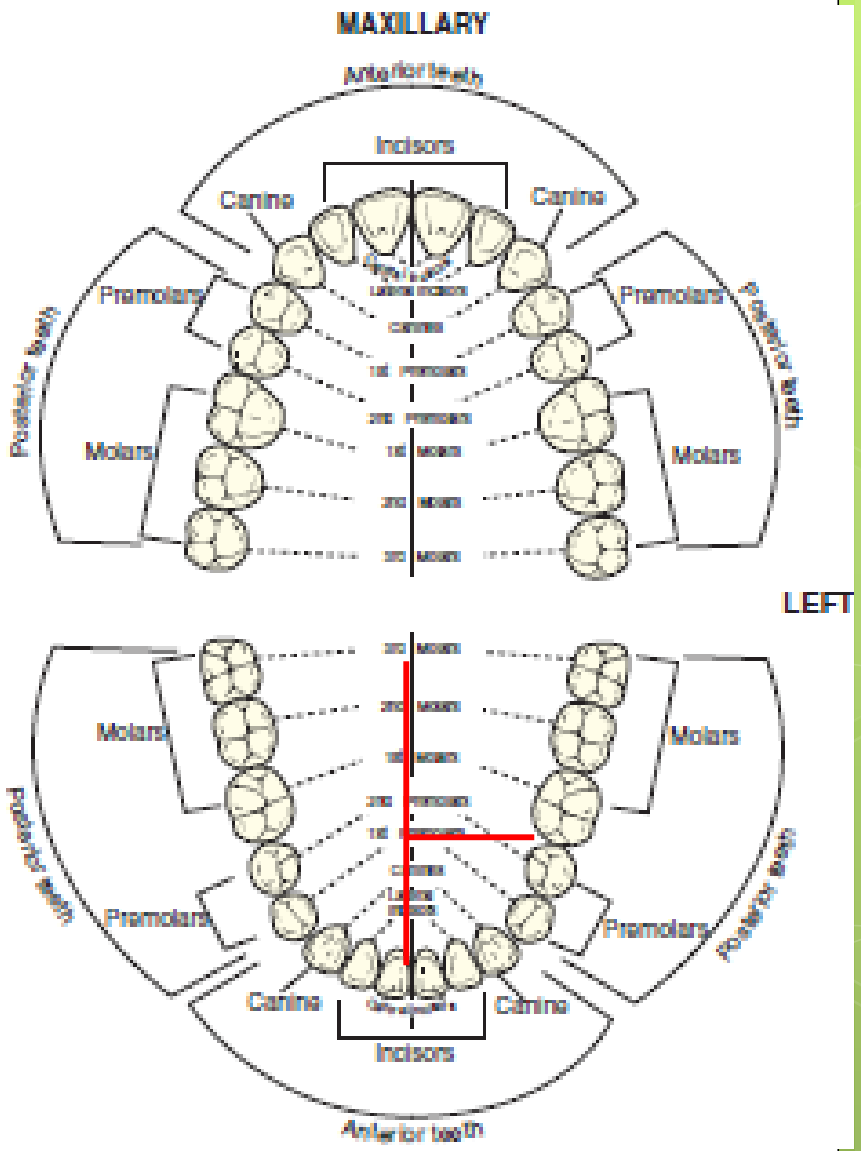
NUMBERING OF MOLARS



- Some statements that are applicable to all first molars, mandibular as well as maxillary.
- The permanent first molars usually appear in the oral cavity when the child is 6 years old. The mandibular molars precede the maxillary molars.

- The first molar is not a succedaneous tooth, since it has no predecessor. The deciduous teeth are all still in position and functioning when the first molar takes its place.

- The normal location of the first permanent molar is at the center of the fully developed adult jaw antero-posteriorly.
- The first molars are considered the "cornerstones" of the dental arches.



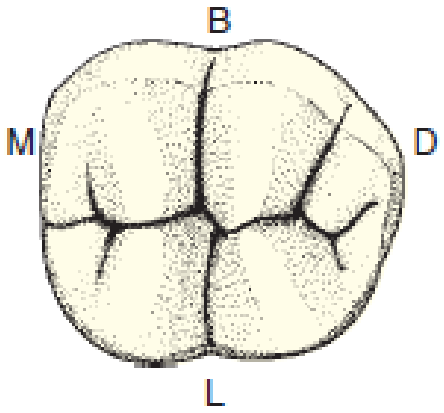
Chronology and Odontometric Data

First evidence of calcification	At birth
Enamel completed	2½–3 yr
Eruption	6–7 yr
Root completed	9–10 yr

Measurement Table

	Cervico-occlusal Length of Crown	Length of Root	Mesiodistal Diameter of Crown	Mesiodistal Diameter of Crown at Cervix	Labio- or Buccolingual Diameter of Crown	Labio- or Buccolingual Diameter of Crown at Cervix	Curvature of Cervical Line—Mesial	Curvature of Cervical Line—Distal
Dimensions* suggested for carving technique	7.5	14.0	11.0	9.0	10.5	9.0	1.0	0.0

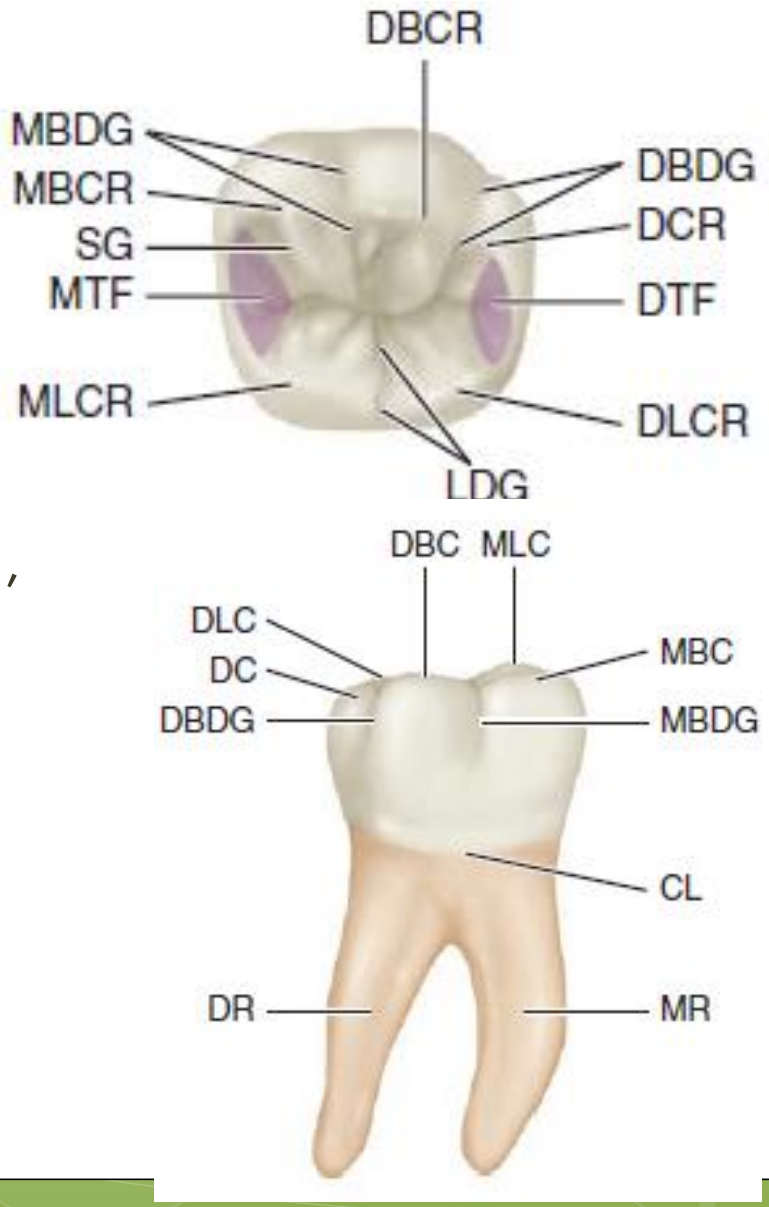
- The crown outlines exhibit similarities of outline from all aspects
- Two roots, one mesial and one distal.
- Roughly quadrilateral, being somewhat longer mesiodistally than buccolingually.
- Maxillary molar crowns have their widest measurement buccolingually.



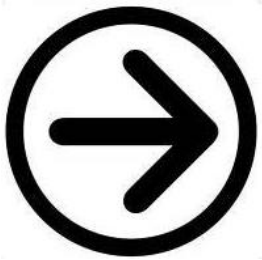
Mandibular First Molar

Mandibular First Molar

- Largest tooth in the mandibular arch.
- 5 well-developed cusps: two buccal, two lingual, and one distal.
- 2 well-developed roots, one mesial and one distal, (broad buccolingually).
- Mesiodistally > buccolingually (1mm).



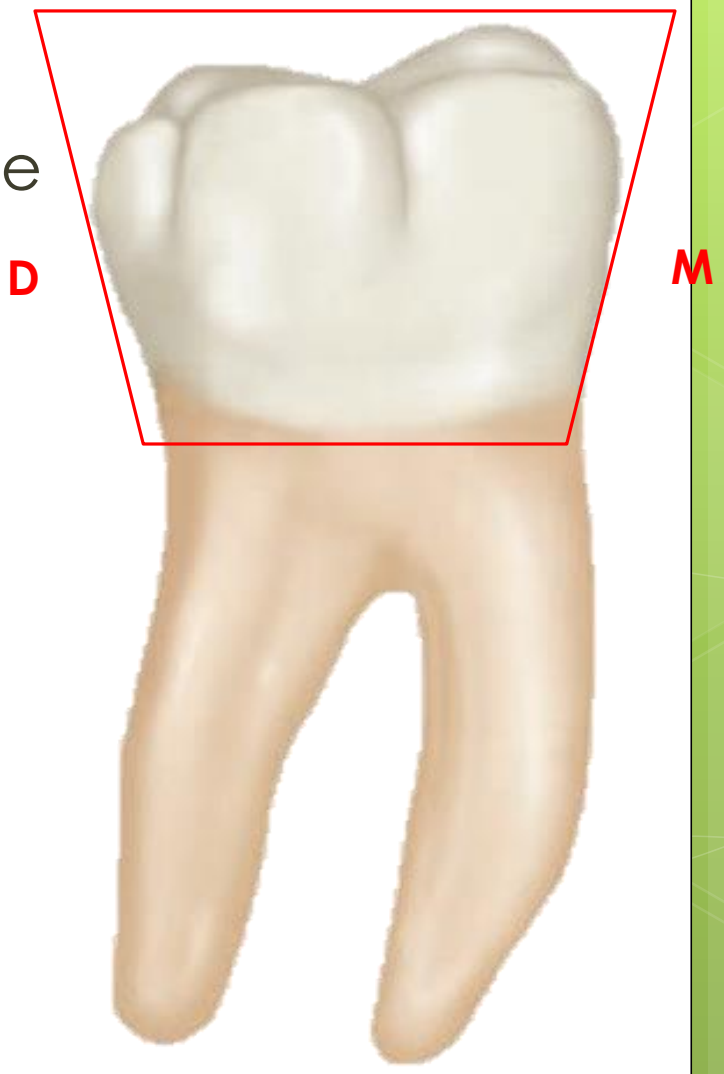
Detailed Description



Mandibular First Molar

Mandibular First Molar

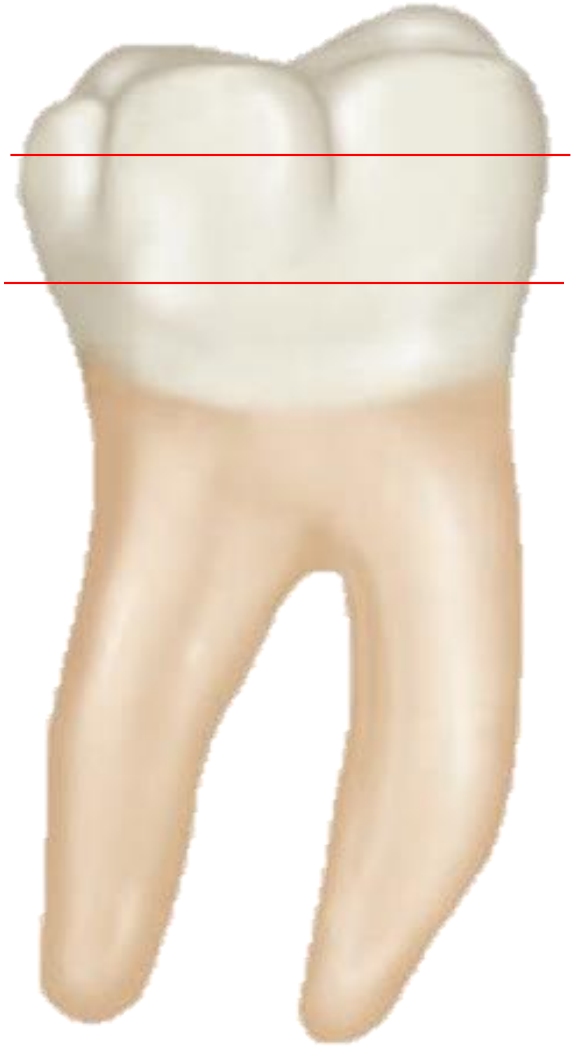
- ***Geometric shape:*** The buccal aspect is *trapezoidal* with its shorter uneven side towards the cervical portion.
- ***Crown Outlines:*** The buccal aspect has four outlines:
  1. Mesial
  2. Distal
  3. Occlusal
  4. Cervical.



Mandibular First Molar

1. Mesial Outline:

- The mesial outline is convex except near the cervical line where it is concave.
- Its maximum convexity (*mesial contact area*) is at the junction of occlusal and middle thirds.



Mandibular First Molar

2. *Distal Outline:*

- The distal outline begins as a straight line near cervix and soon becomes convex forming the *distal contact area* at the middle third of crown.

Mandibular First Molar

3. Occlusal Outline:

- The occlusal outline is formed by the cusp ridges of the two buccal cusps and a small distal cusp.
- The outline is interrupted by two developmental grooves separating the three cusps.
- The tips of two lingual cusps are also seen in the background.

Mandibular First Molar

3. Cervical Outline:

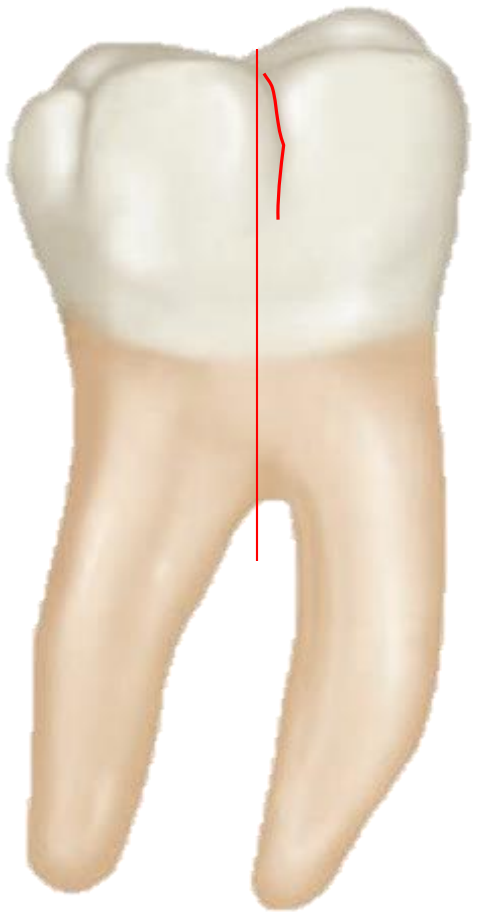
- The cervical line on buccal surface is curved apically and often shows a sharp dip pointing towards the bifurcation area.

Buccal Surface within the Outlines

- All the five cusps are visible from buccal aspect.
- Most of the buccal surface is formed by the two buccal cusps.
- The mesiobuccal cusp is wider than the distobuccal cusp (relatively sharper).
- The mesial and distal cusp ridges of the two buccal cusps are relatively flat and meet at more obtuse angles.

Buccal Surface within the Outlines

- ***Mesiobuccal developmental groove*** *(*runs for half the distance of buccal surface to end in the buccal pit)
- It is placed slightly mesial to the root bifurcation.



Buccal Surface within the Outlines

- ***Distobuccal developmental groove*** approaches the distobuccal line angle of the crown.

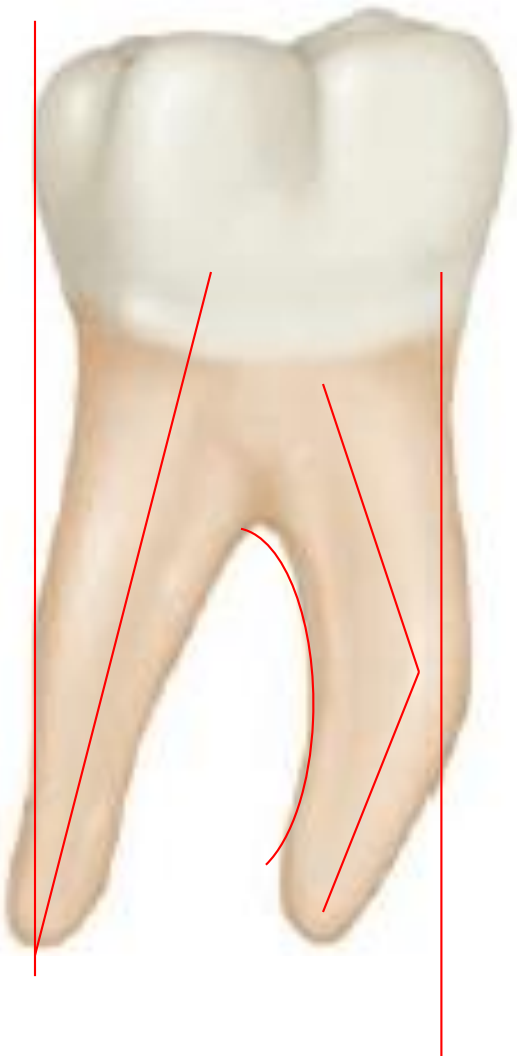
- The buccal surface is convex in the occlusal third except for the interruption of buccal grooves and it is more convex in the cervical third forming the buccal cervical ridge.

Mandibular First Molar

- The mesiobuccal groove is the shorter of the two, having its terminus centrally located cervico-occlusally.
- The distobuccal groove has its terminus near the distobuccal line angle at the cervical third of the crown.

Mandibular First Molar

Roots:



Mandibular First Molar

Root trunk and root surface

Mandibular First Molar

Mandibular First Molar

- 3 cusps may be seen: two lingual and the lingual portion of the distal cusp.
- Lingual cusps are pointed, and the cusp ridges are high enough to hide the two buccal cusps from view.
- The mesiolingual cusp is the widest mesiodistally, with its cusp tip somewhat higher than the distolingual cusp.

Mandibular First Molar

- The mesiolingual and distolingual cusp ridges are inclined at angles that are similar on both lingual cusps. These cusp ridges form obtuse angles at the cusp tips of approximately 100 degrees.

Mandibular First Molar

- The **lingual developmental groove.**
- The distal cusp is at a lower level than the mesiolingual cusp.
- The mesial outline
- The crest of contour mesially, which represents the contact area, is somewhat higher than the crest of contour distally.
- The distal outline.

Mandibular First Molar

- The cervical line lingually is irregular and tends to point sharply toward the root bifurcation.

Mandibular First Molar

- The surface of the crown lingually is smooth and spheroidal on each of the lingual lobes.
- The roots of the mandibular first molar longer lingually than buccally, about 1 mm.
- the root bifurcation lingually starts approx 4 mm below the cervical line.
- Deep developmental depression progresses cervically, becoming more shallow until it fades out entirely immediately below the cervical line.

Mandibular First Molar

Mandibular First Molar

- two cusps and one root only are to be seen: the mesiobuccal and mesiolingual cusps and the mesial root.
- The buccolingual measurement of the crown is greater at the mesial portion than it is at the distal portion.
- Mesial portions of the tooth are broader and the mesial cusps are higher, the distal portions of the tooth cannot be seen from this angle.

Mandibular First Molar

- The crown from the mesial or distal aspect is roughly rhomboidal, and the entire crown has a lingual tilt in relation to the root axis.

Mandibular First Molar

- The buccal outline is convex immediately above the cervical line.(**buccal cervical ridge**).
- Above the buccal cervical ridge, slightly concave or *less convex* or even rather flat as it continues occlusally outlining the contour of the mesiobuccal cusp.
- The mesiobuccal cusp is located directly above the buccal third of the mesial root.

Mandibular First Molar

- The lingual outline of the crown is straight in a lingual direction.
- The crest of the lingual contour is located at the center of the middle third of the crown.
- The tip of the mesiolingual cusp is in a position directly above the lingual third of the mesial root.

Mandibular First Molar

- The cervical line mesially is rather irregular and tends to curve occlusally about 1 mm toward the center of the mesial surface of the tooth.
- In all instances, the cervical line is at a higher level lingually than buccally, usually about 1 mm higher. The difference in level may be greater.

Mandibular First Molar

- The buccal outline of the mesial root drops straight down from the cervical line buccally to a point near the junction of cervical and middle thirds of the root.
- A gentle curve starts lingually from this point to the apex.

Mandibular First Molar

- The lingual outline is slanted in a buccal direction.
- From this point, the curvature is sharply buccal to the bluntly tapered apex.

Mandibular First Molar

- The mesial surface of the mesial root is convex at the buccal and lingual borders, with a broad concavity between these convexities the full length of the root from cervical line to apex.

Mandibular First Molar

Mandibular First Molar

- The gross outline of the distal aspect of the crown and root of the mandibular first molar is similar to that from the mesial aspect.

Mandibular First Molar

- More of the tooth is seen from the distal aspect, because the crown is shorter distally than mesially.
- The buccal and lingual surfaces of the crown converge distally.
- The buccal surface shows more convergence than the lingual surface.
- The distal root is more narrow buccolingually than the mesial root.

Mandibular First Molar

- The distal marginal ridge is short and is made up of the distal cusp ridge of the distal cusp and the distolingual cusp ridge of the distolingual cusp.
- These cusp ridges dip sharply in a cervical direction, meeting at an obtuse angle.

Mandibular First Molar

- The distal contact area is centered over the distal root, which arrangement places it buccal to the center point of the distal marginal ridge.

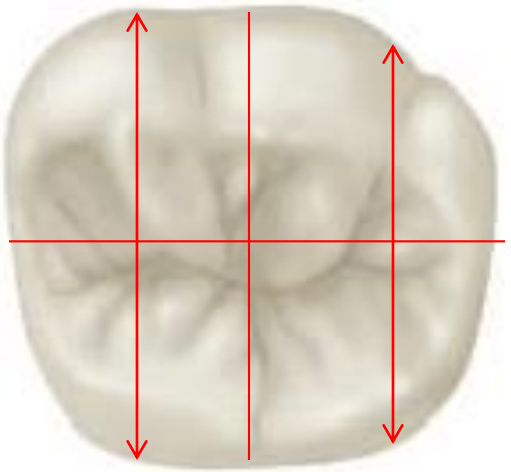
Mandibular First Molar

- The cervical line distally usually extends straight across buccolingually. It may be irregular, dipping rootwise just below the distal contact area

Mandibular First Molar

Mandibular First Molar

- The crown measurement is 1 mm or more greater mesiodistally than buccolingually.
- Opposite is true for the maxillary first molar.
- The buccolingual measurement of the crown is greater on the mesial than on the distal side.



Mandibular First Molar

- The elevations and depressions on this surface are:

1. Cusps
   - Mesiobuccal cusp is the largest followed by the two lingual cusps, then the distobuccal, and the smallest being the distal cusp.
2. Ridges
   - Mesial marginal ridge and distal marginal ridge
3. Fossae
   - Major fossae: central fossa
   - Minor fossae: mesial triangular and distal triangular fossae

4 Grooves
   - Central developmental groove
   - Mesiobuccal developmental groove
   - Distobuccal developmental groove
   - Lingual developmental groove
   - Supplemental grooves

5 Pit
   - Central developmental pit

Mandibular First Molar

- Major fossa- circular
- Mesial and distal triangular fossa

Mandibular First Molar

Grooves

- Central developmental groove
- Mesiobuccal developmental groove
- Distobuccal developmental groove
- Lingual developmental groove
- Supplemental grooves

Mandibular First Molar

- All of the developmental grooves converge in the center of the central fossa at the central pit.
- **mesial pit**