



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

IN THE NAME OF ALLAH THE MOST  
GRACIOUS THE MOST MERCIFUL

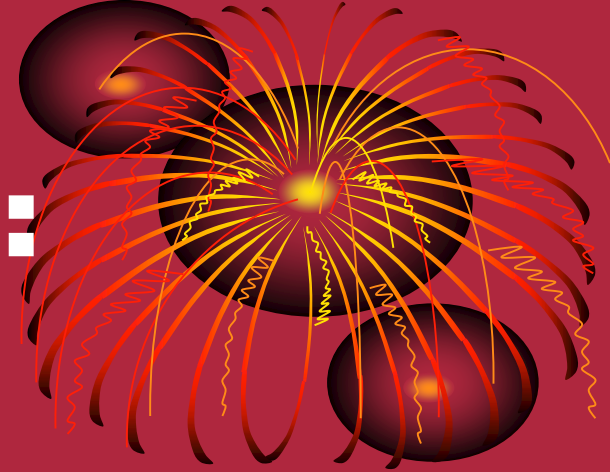


# **SURFACE ANATOMY OF PERMANENT MOLARS**



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# General Features :



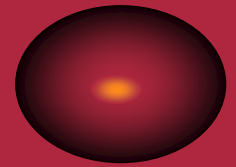
**1. Twelve in number.**

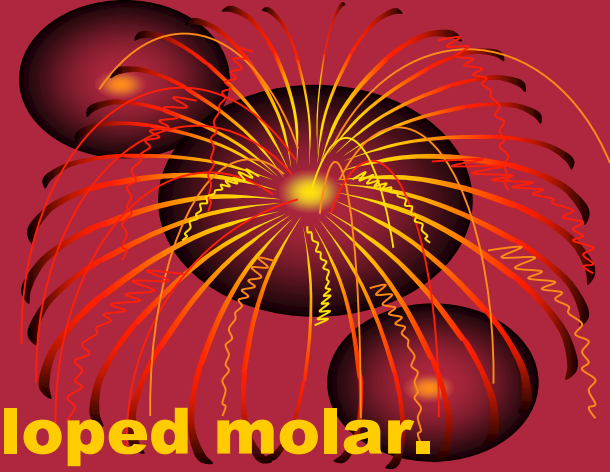
**2. Largest and strongest teeth.**

**3. Have no deciduous predecessors.**

**4. Lower 1<sup>st</sup> molars are formed from 5 lobes.**

**5. Second and some third molars may have only 4 lobes.**





**6. The 1<sup>st</sup> molar is the most developed molar.**

**7. The 3<sup>rd</sup> molar exhibits the most variable morphology.**



**8. Molars are multirooted teeth (2-3 roots).**

**9. Used in grinding food.**

**10. They support and maintain the vertical dimension of the face.**



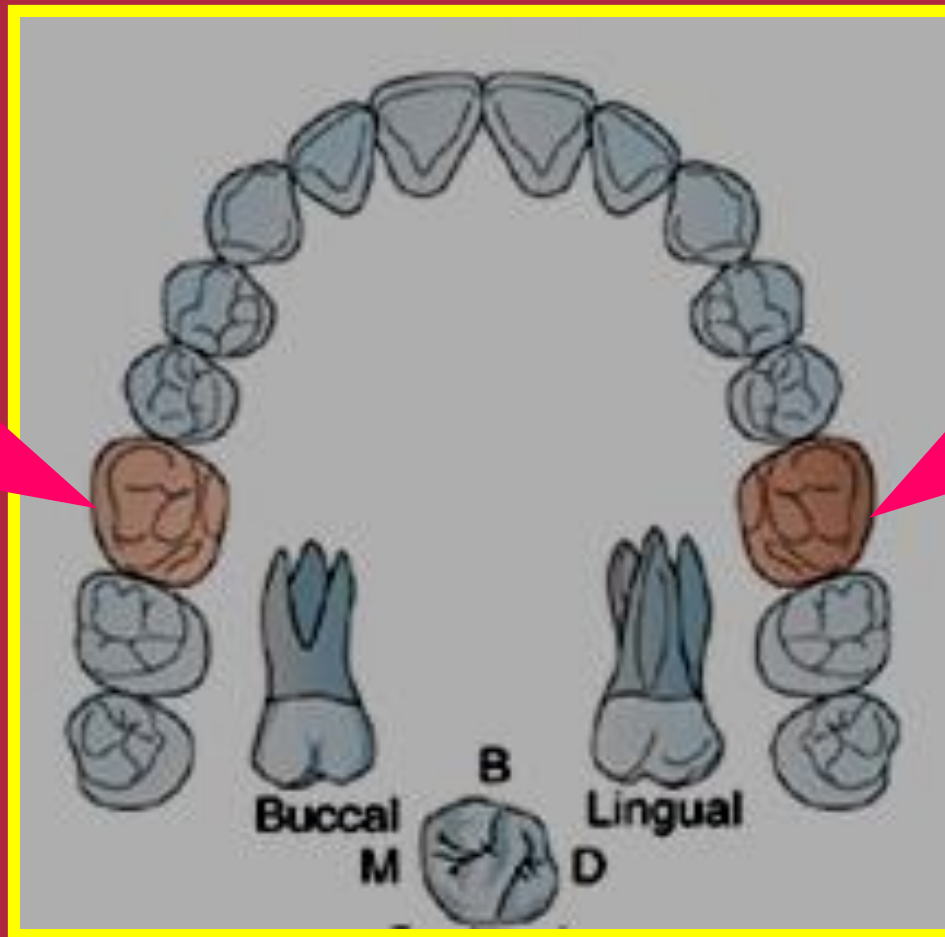
**11. They have wide occlusal surface.**

**12. They are the most posteriorly situated teeth in the mouth (distal to the 2<sup>nd</sup> premolar).**

**13. They are multicusped teeth.**

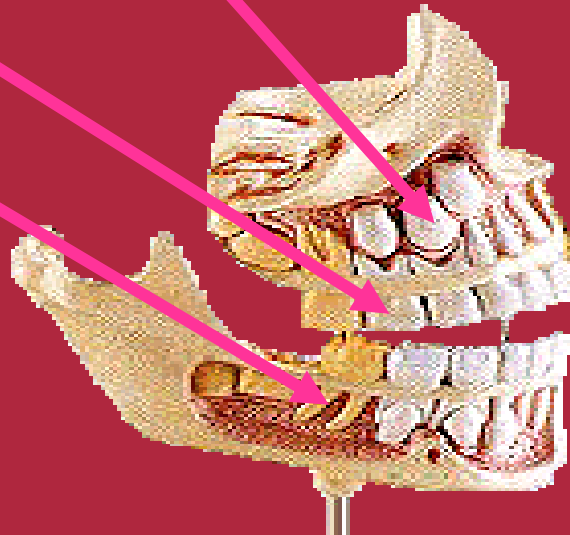
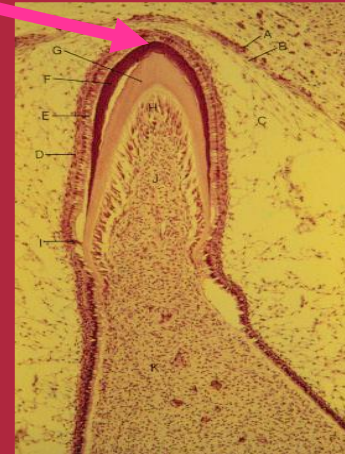
**14. Cervical margin is much less curved than in the anterior teeth.**

# *Maxillary Permanent 1ST Molar*



# *Chronology:*

- Enamel organ appearance.
- Beginning of calcification.
- Crown completed.
- Eruption.
- Root completed.



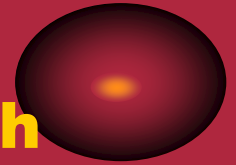
# Chronology

**Appearance of dental organ**



**First evidence of calcification**

**at birth**



**Enamel completed**

**3-4 years**

**Eruption**

**6-7 years**

**Root completed**

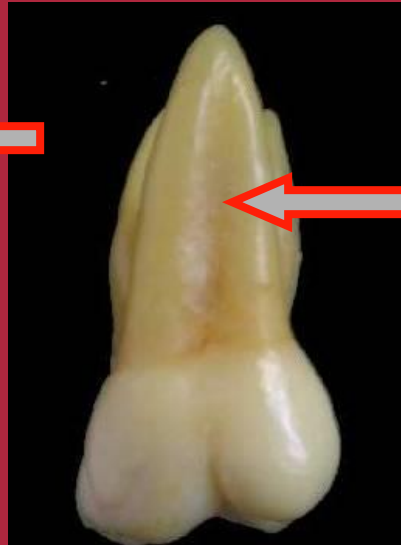
**9-10 years**

# No. of surfaces:

It has five surfaces



**BUCCAL**



**PALATAL**



**MESIAL**



**DISTAL**

# No. of roots:

It has 3 roots

**OCCLUSAL**

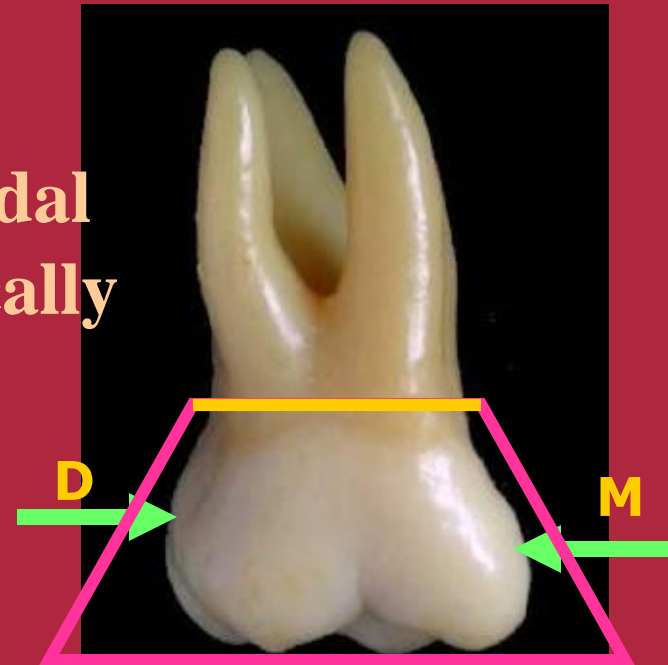


# BUCCAL ASPECT

**The geometric outline:** Trapezoidal with small uneven side present cervically

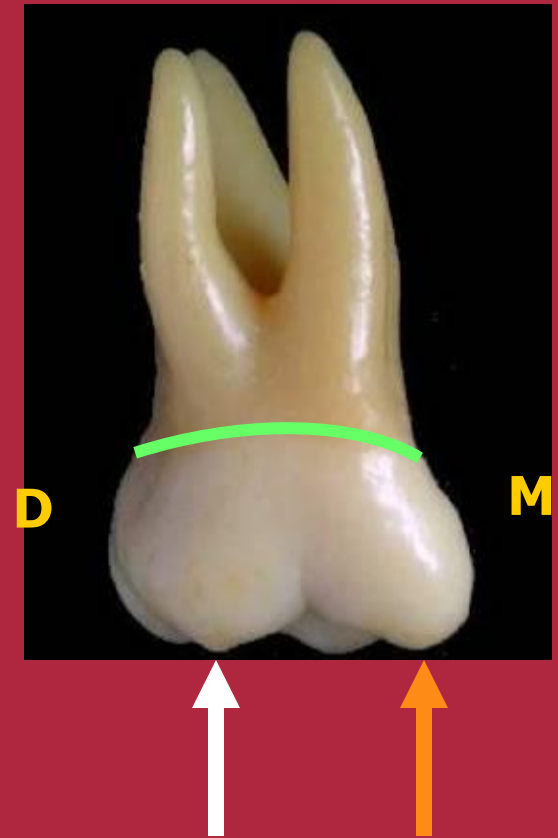
**Mesial outline:** Nearly straight till the contact area at the junction of the occlusal and middle 1/3

**Distal outline:** Convex till the contact area at the middle 1/3



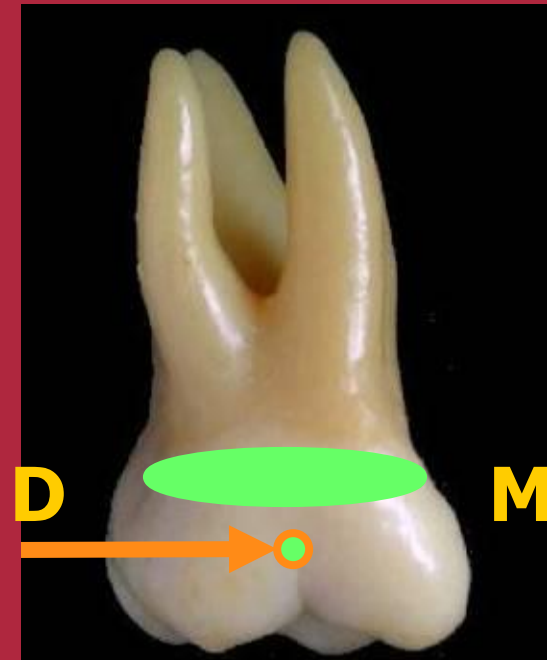
**Occlusal outline:** Mesio-buccal cusp is broader, shorter and less sharp than disto-buccal cusp

**Cervical outline:** Irregular and slightly convex toward the root



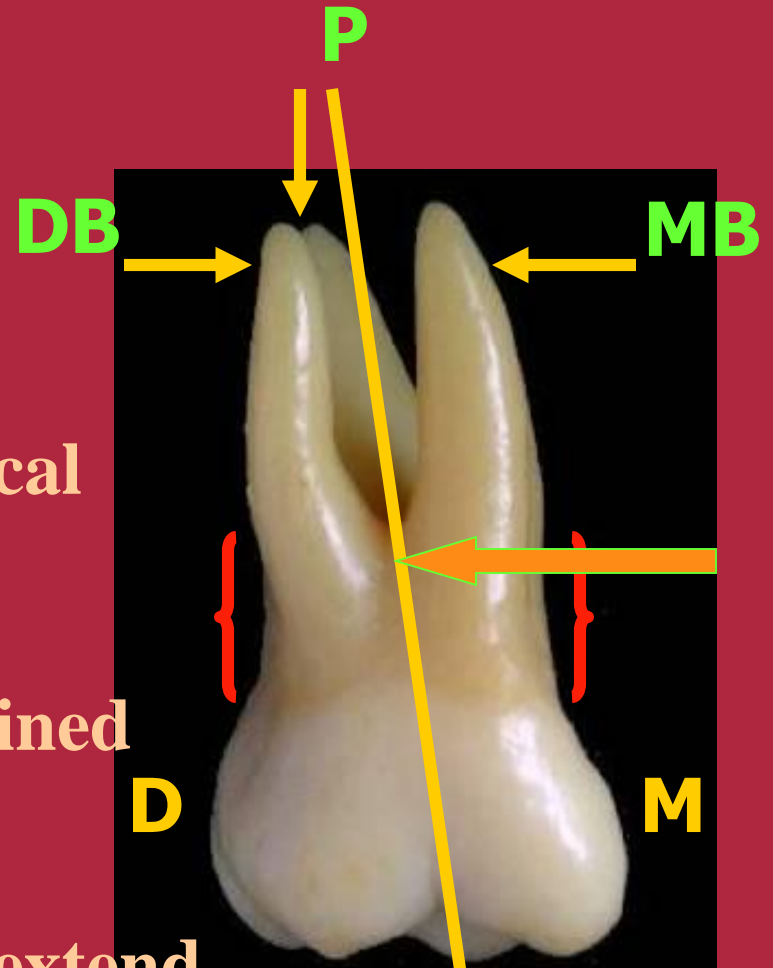
## Anatomical landmarks:

- \* Convex buccal surface.
- \* Buccal groove may terminate by buccal pit.
- \* Cervical ridge.




## *The Roots:*

- \* Root trunk: 4 millimeters
- \* 3 roots are seen from the buccal aspect.
- \* The axis of the roots are inclined distally
- \* Deep developmental groove extend on root trunk

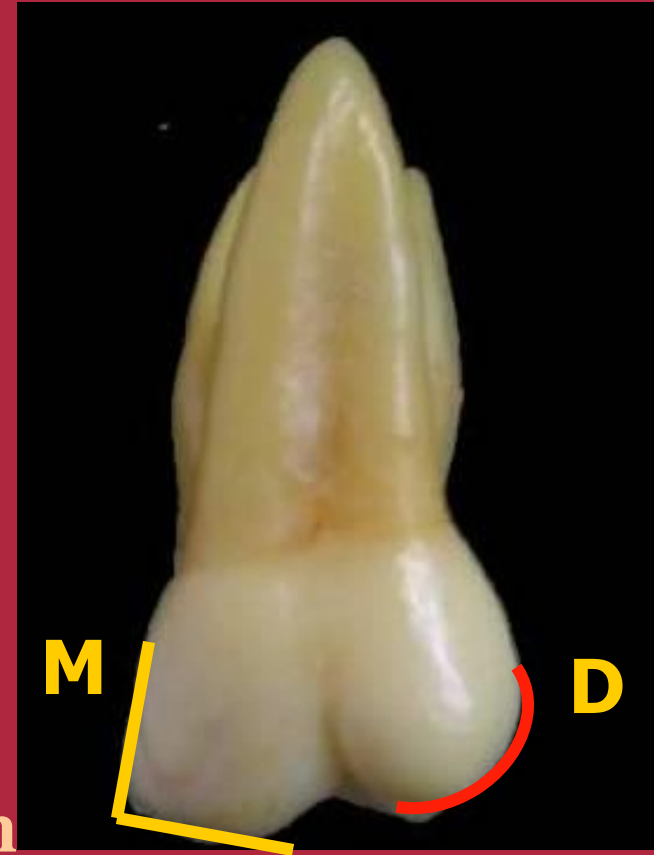


# LINGUAL ASPECT

\* No lingual convergence

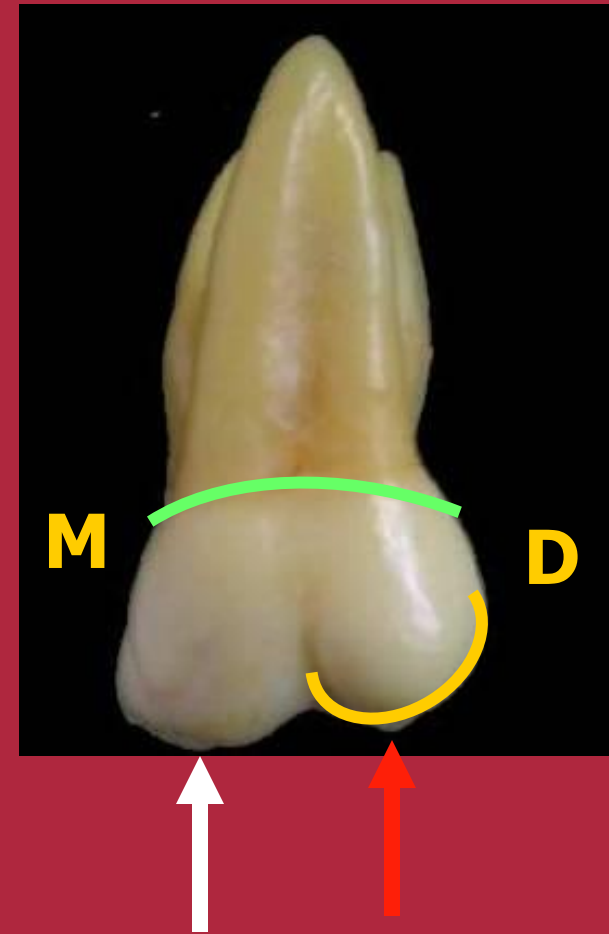
**Mesial outline:** Nearly straight and form  with the mesial slope of the ML cusp

**Distal outline:** Convex and form  with the distal slope of the DL cusp



**Occlusal outline:** ML cusp is the largest and longest cusp. DL cusp is spheroidal

**Cervical outline:** Irregular and slightly convex toward the root

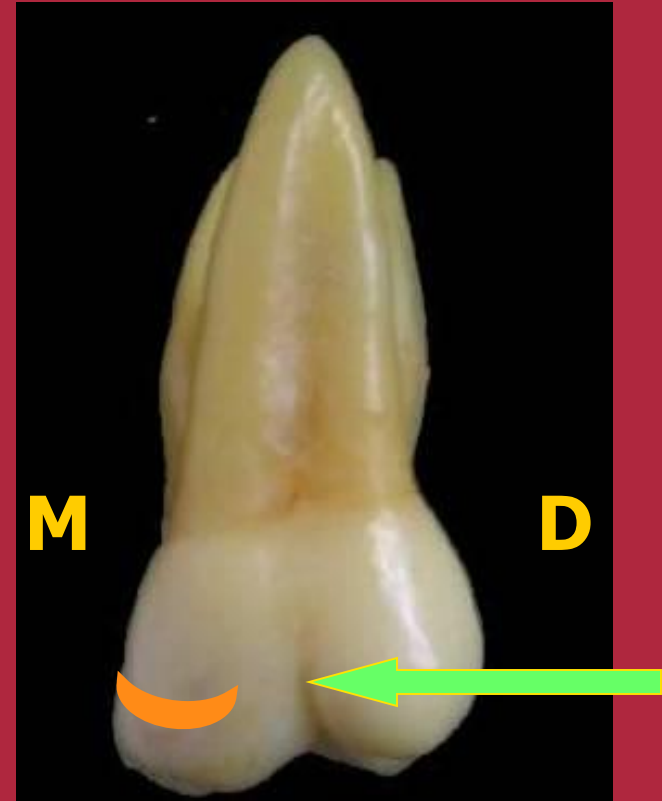


## Anatomical landmarks:

\*Convex lingual surface.

\*Cusp of carabelli in 60 % of the lingual surface of ML cusp

\*Lingual developmental groove.



# MESIAL ASPECT

## The geometric outline:

Trapezoidal with small uneven side occlusally

**Buccal outline:** \* Convex at cervical 1/3 denoting cervical ridge

\* Concave at the middle 1/3 denoting the termination of buccal developmental groove

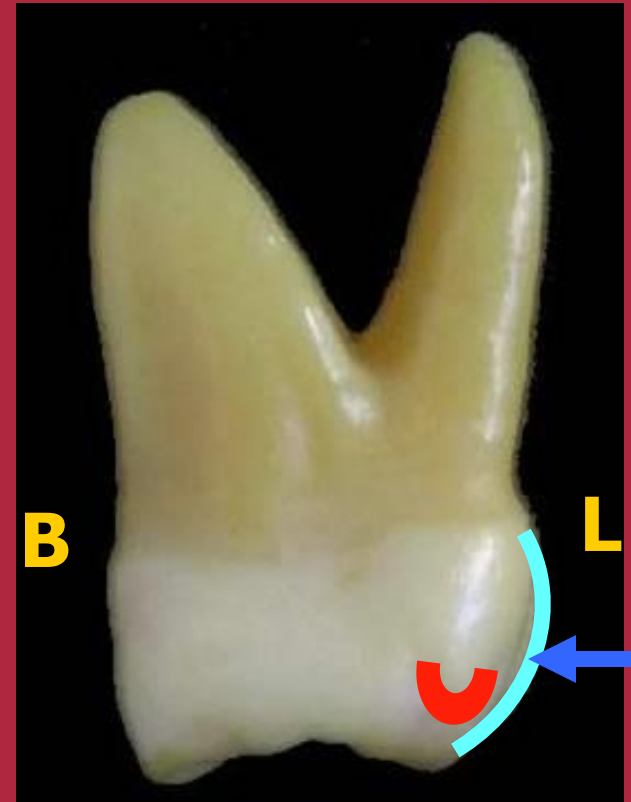
\* Convex at the occlusal 1/3 representing circumscribed MB cusp



## Lingual outline:

\* Convex with the crest of curvature at the middle 1/3.

\* The lingual outline dips inward to illustrate the **tubercle**.



## Occlusal outline:

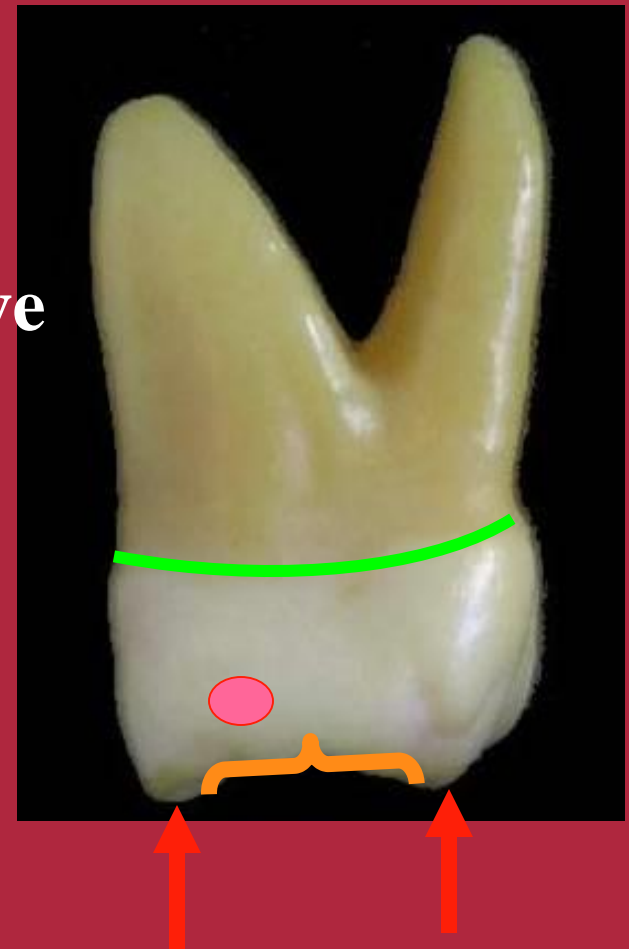
- \* Represented by **ML**, **MB** cusps
- \* Irregular **MMR** which curve cervically.

## Cervical outline:

Irregular and convex occlusally

## Anatomical landmarks

Mesial **contact area** at the junction between middle and occlusal 1/3, buccal to the center

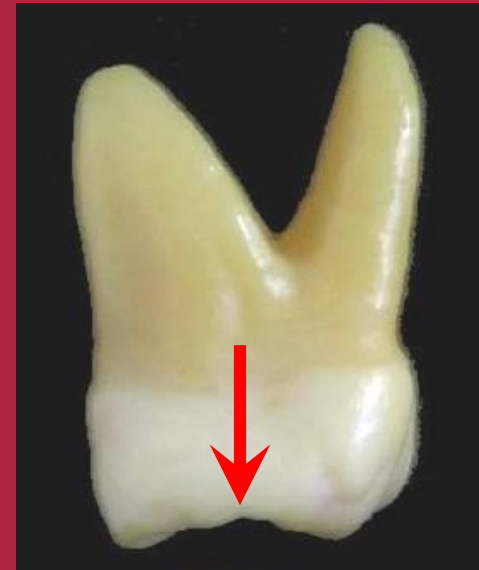


## DISTAL ASPECT



- \* Distal Convergence
- \* Convex distal surface
- \* Distal MR curved cervically

## MESIAL ASPECT

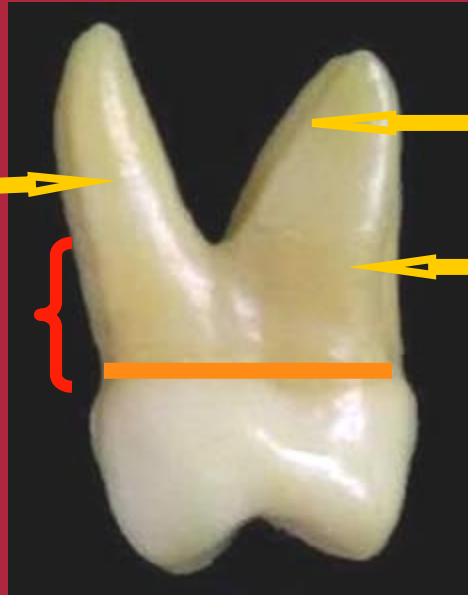


- \* Wider mesial surface
- \* Flat mesial surface
- \* Mesial marginal ridge less curved

**Continue**



## DISTAL ASPECT

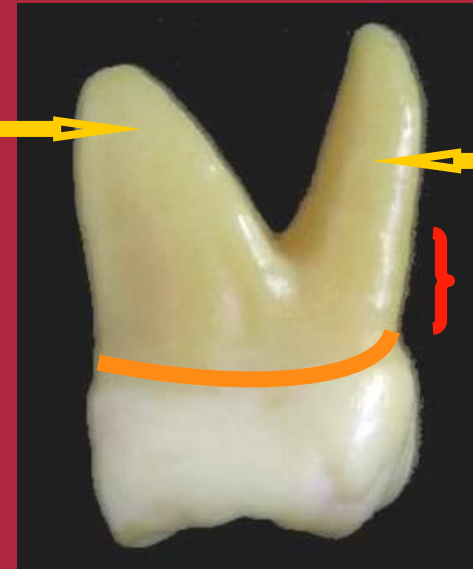


\*Straight cervical line

\*Root trunk = 5mm

\*3 roots are seen

## MESIAL ASPECT



\*Cervical line convex occlusally

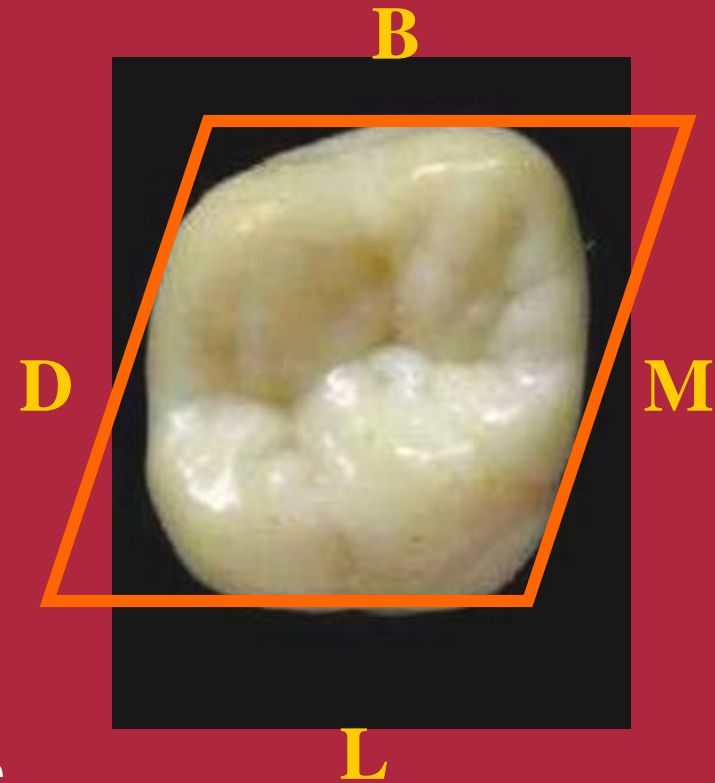
\*Root trunk = 3mm

\*2 roots are seen

# OCCLUSAL ASPECT

The geometric outline:  
Rhomboidal

- Note:** \* Disto-buccal convergence.  
\* ML, BD angles are obtuse.  
\* MB, DL angles are acute.



**Anatomical landmarks:**

**Elevations:**

**\*4 cusps with 4 triangular ridges and tubercle**

**\*Oblique ridge between ML,DB triangular ridge**

**\* MMR and DMR**



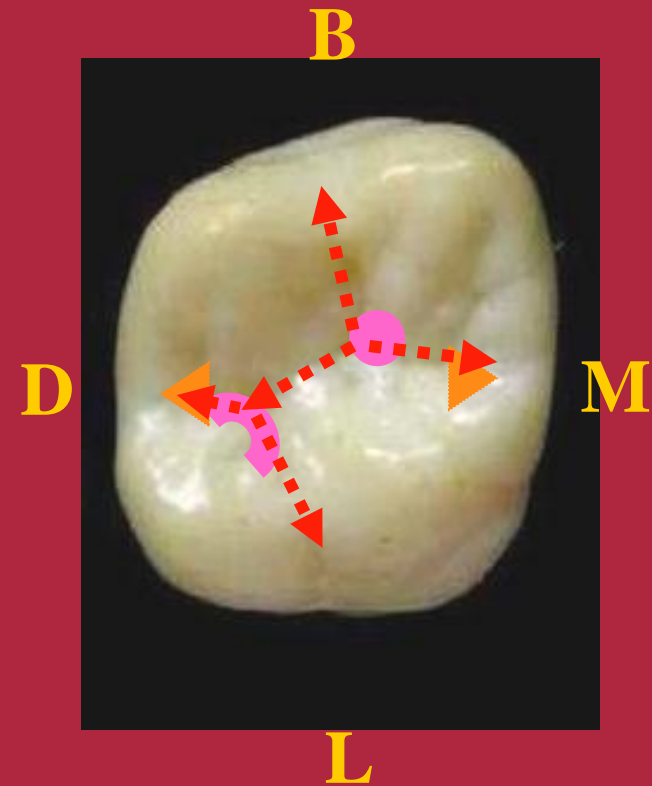
## Anatomical landmarks:

### Depression:

\*2 major fossae ( central and distal)

\*2 Minor fossae ( mesial and distal triangular fossae)

\*Developmental grooves (Buccal, Central, Transverse groove of oblique ridge, Distal oblique groove and Lingual groove)



**Note :**

**The maxillary 1<sup>st</sup> molar is the only molar that is wider lingually than buccally.**





**The mesiolingual cusp is the largest cusp, followed by the rounded mesiobuccal, the sharp distobuccal, the small distolingual, and the tubercle of Carabelli.**

Enumerate the names of the following elevations and depression?

1-DMR

2-Oblique ridge

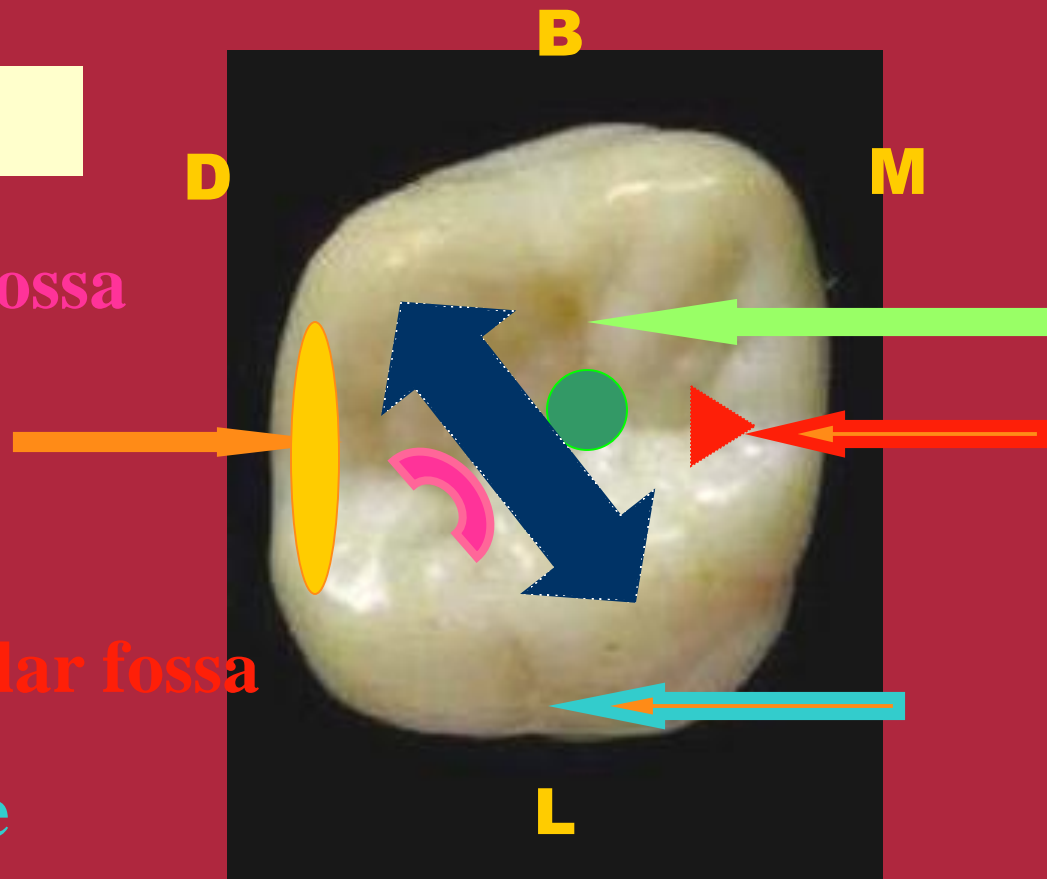
3-Distal linear fossa

4- Central fossa

5- Buccal groove

6- Mesial triangular fossa

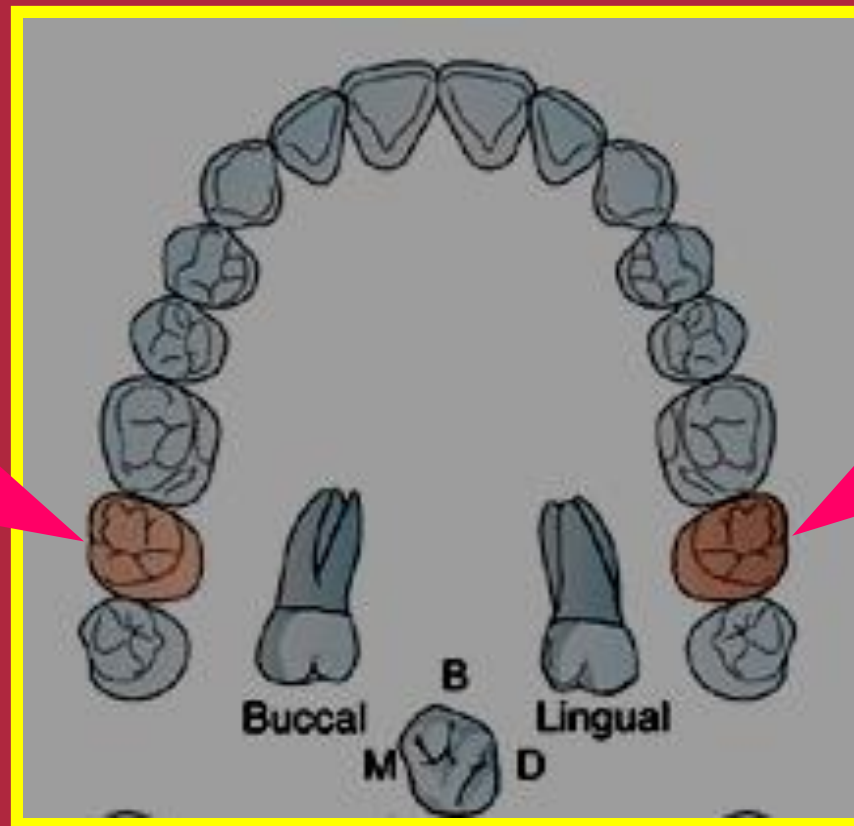
7- Lingual groove





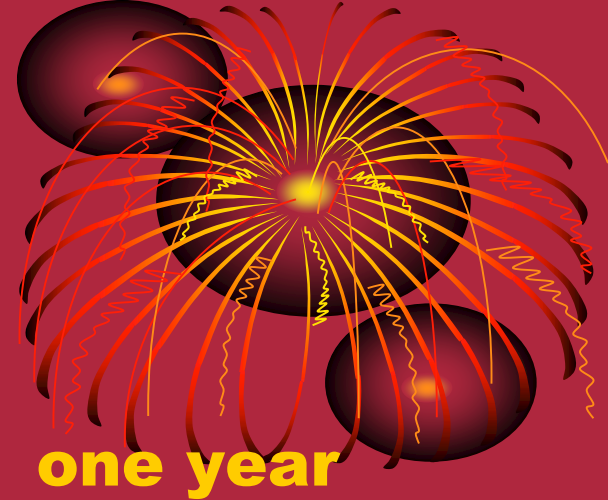
**Niagra Falls**

# Maxillary Permanent 2nd Molar



# Chronology

**Appearance of dental organ**



**First evidence of calcification**

**2.5-3 years**

**Enamel completed**

**7-8 years**

**Eruption**

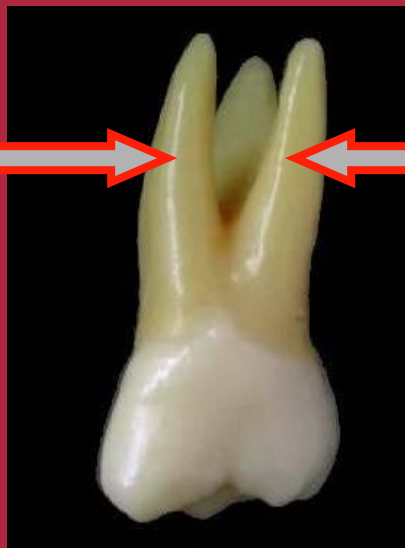
**12-13 years**

**Root completed**

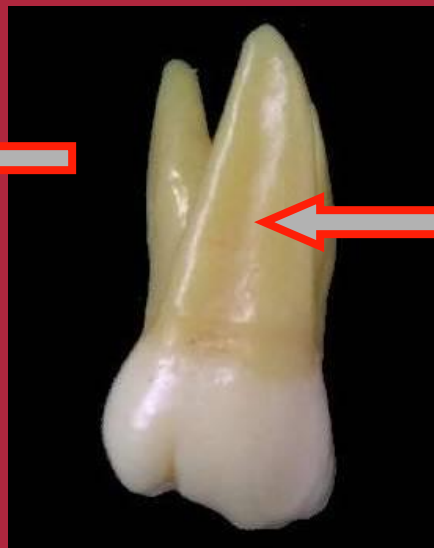
**14-16 years**

## No. of surfaces:

It has five surfaces



**BUCCAL**



**PALATAL**



**MESIAL**



**DISTAL**

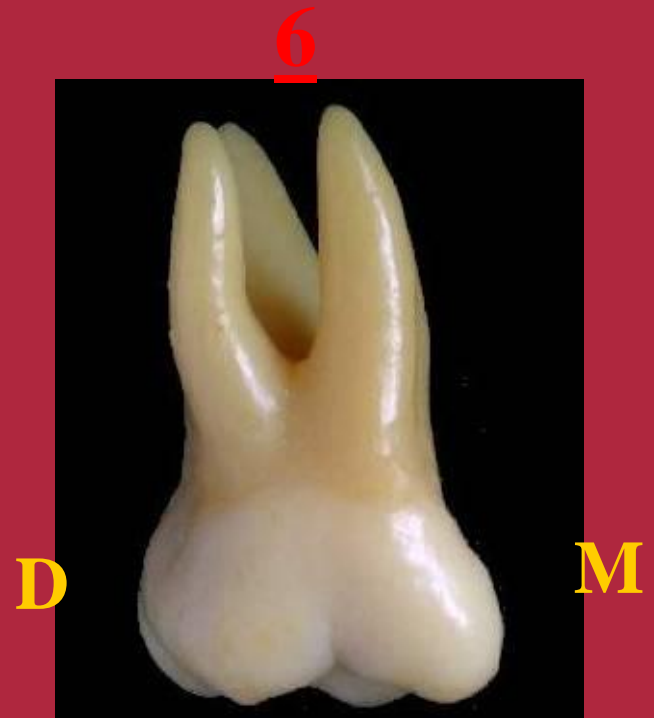
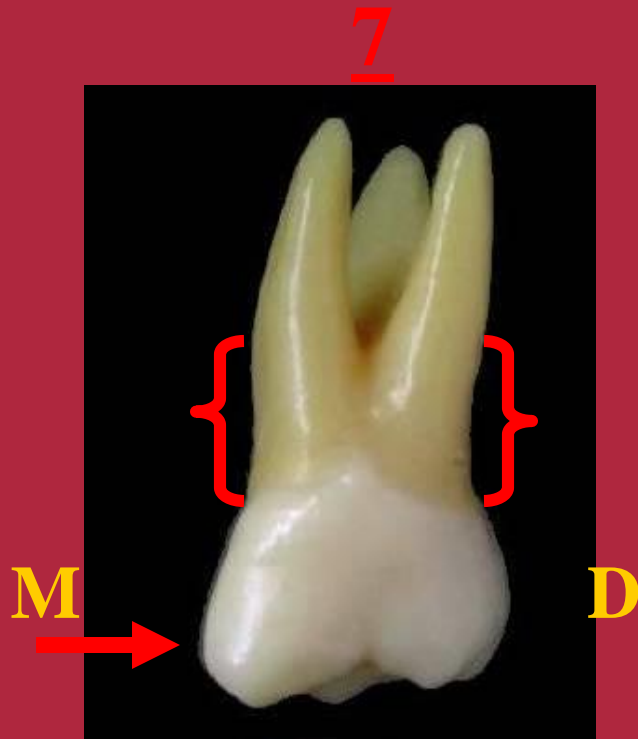
## No. of roots:

It has 3 roots

**OCCLUSAL**



# BUCCAL ASPECT



in 7 MB cusp is larger and longer than DB cusp

The root trunk is longer in 7

# LINGUAL ASPECT



\* DL cusp is smaller in 7. It may be missed (3 - cusp type)

\* No cusp of carabelli in 7

# MESIAL ASPECT



L



\* No cusp of carabelli in 7

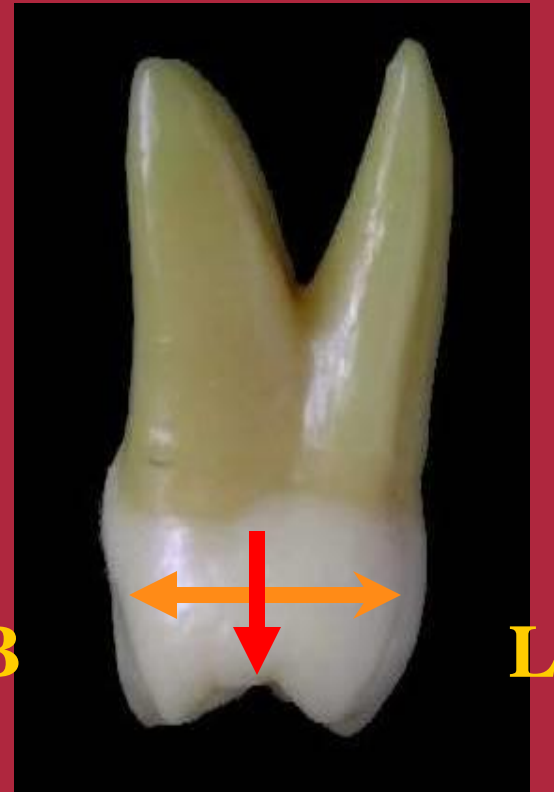
\* MB and P roots in 7 are confined within the BL outlines of the crown

# DISTAL ASPECT

\* Distal Convergence

\*\* Convex distal surface

\*\*\* Distal MR curved cervically



# OCCLUSAL ASPECT

B



M

L

4 cusp type

◻ outline typical to 6

Disto-lingual convergence

No tubercle of carabelli

B



D

M

L

3 cusp type

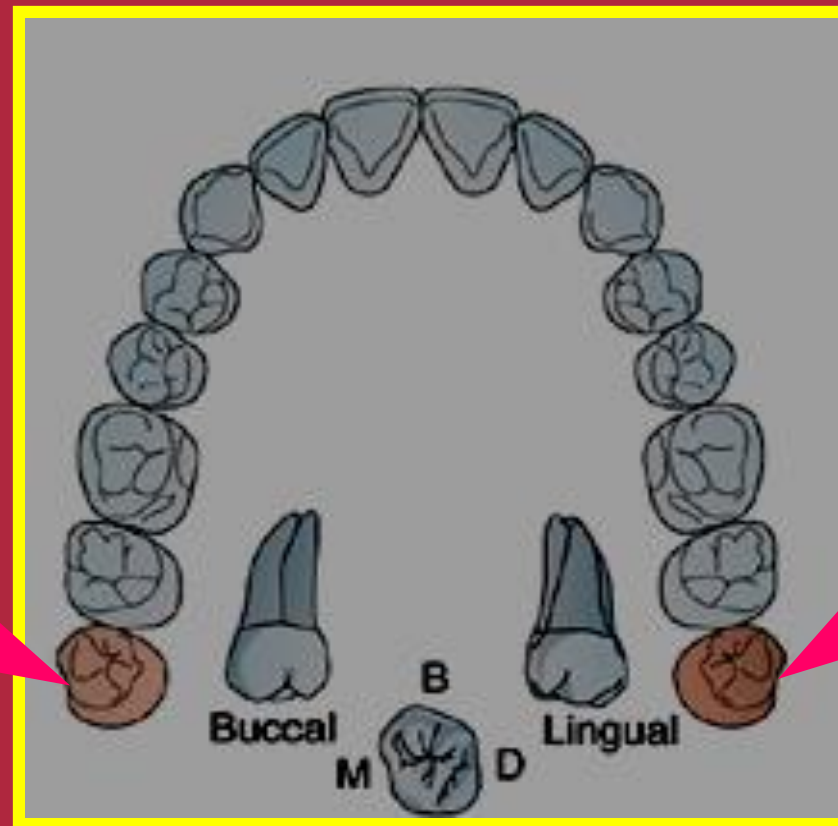
♥ shape typical to 8

No disto-lingual cusp, No lingual or distal oblique grooves



**Niagra Falls**

# Maxillary Permanent 3rd Molar



# Chronology

**Appearance of dental organ**



**First evidence of calcification**

**7-9 years**



**Enamel completed**

**12-16 years**

**Eruption**

**17-21 years**

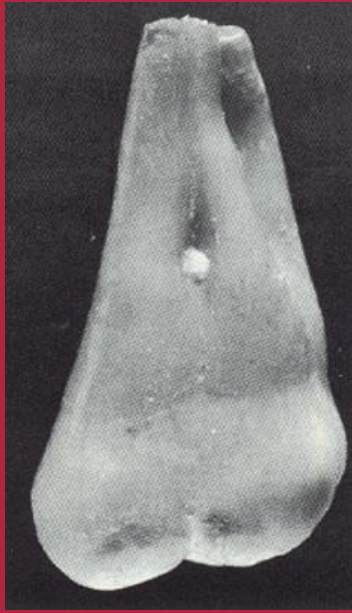
**Root completed**

**18-25 years**

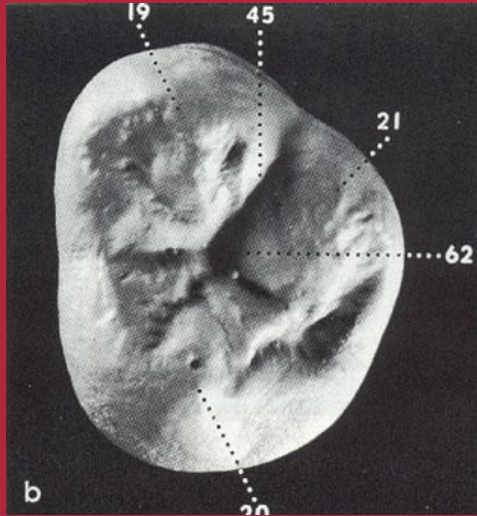
# No. of surfaces:

It has five surfaces

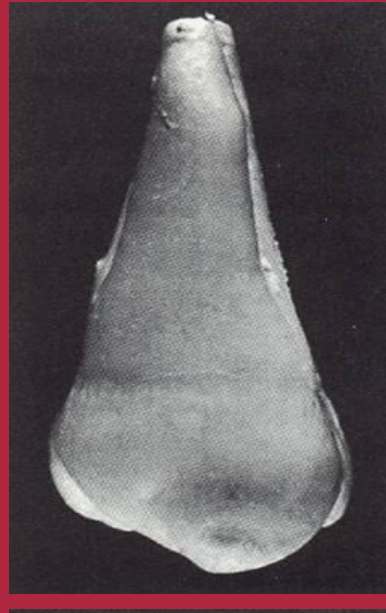
**BUCCAL**



**OCCLUSAL**



**PALATAL**



**MESIAL**



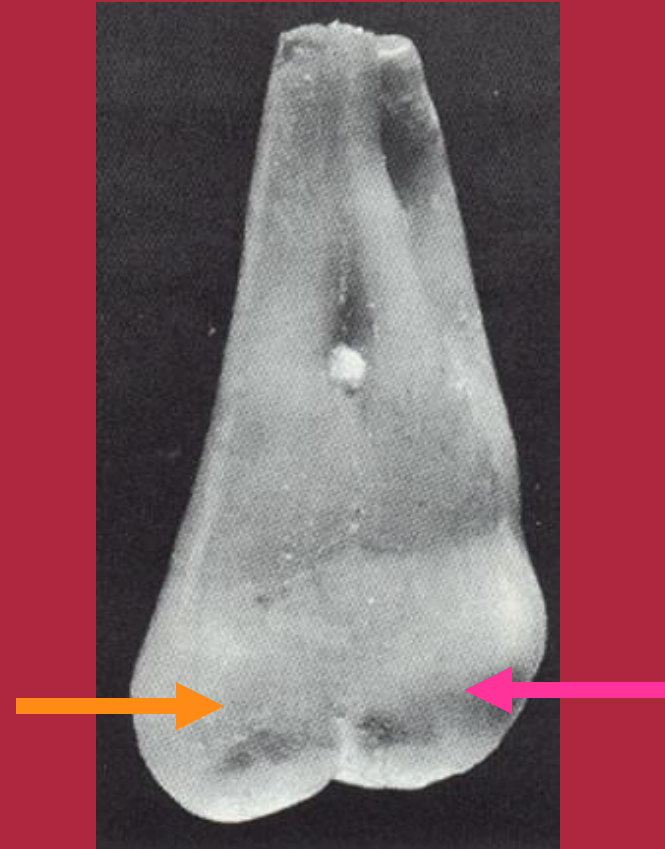
**DISTAL**



## BUCCAL ASPECT

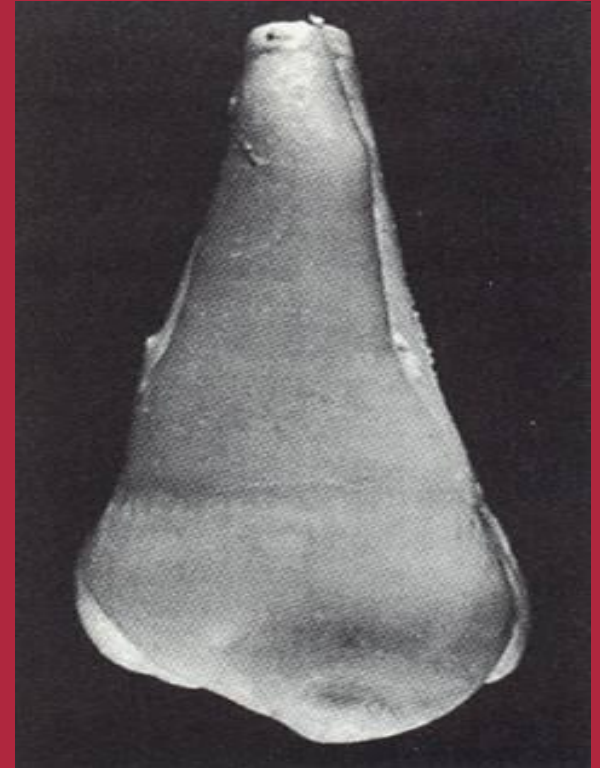
**MB** cusp is wider and longer than **DB** cusp

The roots are often fused making one large short root



## LINGUAL ASPECT

Usually one large lingual cusp  
without lingual groove



## **MESIAL ASPECT**

**Characterized by fusion of the roots and the bifurcation in the apical 1/3**

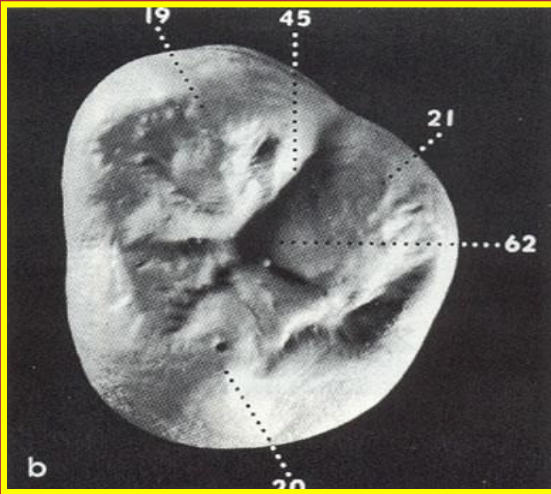


## DISTAL ASPECT

- \*Convex surface with **no** contact area
- \*The distal surface short and narrow. So most of the occlusal surface is seen.



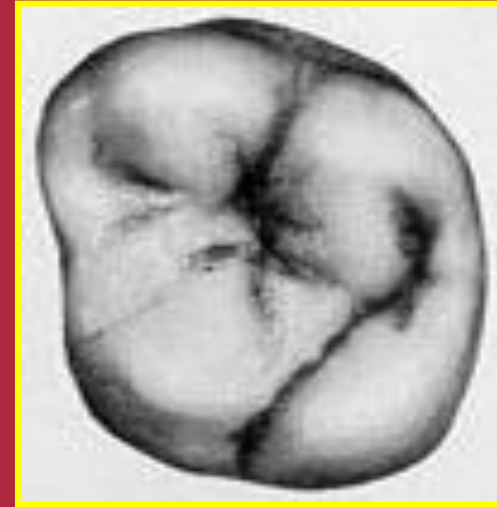
# OCCLUSAL ASPECT



3 cusp type

♥ shape is typical to 7

No disto-lingual cusp, No lingual or distal oblique grooves



4 cusp type

◻ outline typical to 6

There are disto-lingual cusp, Lingual groove and oblique ridge.

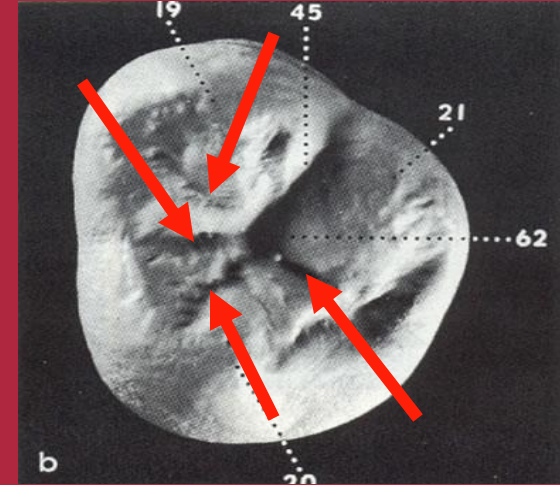
# OCCLUSAL ASPECT

## Notes:

1- The occlusal surface of 8 has numerous supplemental grooves

2- The pulp cavity showed great variation in the size and shape

3- The pulp chamber of 8 is larger than other molars because it is younger than other molars by 9-11 years



**GOOD LUCK**

