

MORPHOLOGY OF PREMOLARS:

FUNCTION OF ALL PREMOLARS:

- Mastication
- Maintaining VERTICAL Dimension of the face
- Assist canines to shear/cut food
- Assist Molars as well because they are in b/w canines and molars
- Support cheeks & corners of the mouth!

SIMILARITIES BETWEEN ALL PREMOLARS!

- ALL premolars have **2 CUSPS** (1 Buccal & 1 Lingual)
 - *EXCEPT, **MAN 2nd premolar** (3 CUSPS – 1 Buccal & 2 Lingual)
- ALL premolars develop from/has **4 LOBES TOTAL!** (3 Facial Lobes & 1 Lingual Lobe)
 - *EXCEPT **MAN 2nd premolar** (5 LOBES TOTAL - 3 Facial lobes & 2 Lingual Lobes)

BUCCAL VIEW:

- ALL premolars have a **PENTAGON shaped crown** outline
- ALL premolars have **CONVEX CONTACT AREAS**
- ALL premolars have a **DISTAL CONTACT** that is **MORE CERVICAL** than the Mesial Contact.
 - *Except **MAN 1st PREMOLAR** (mesial contact = cervical 1/3 ;;;; distal contact = middle 1/3)
- ALL premolars have a **SHORTER MESIAL CUSP RIDGE** than Distal Cusp Ridge
 - *Except **MAX 1st Premolar** (has bigger MCR than DCR)

LINGUAL VIEW:

- ALL premolars **CROWNS TAPER TOWARD LINGUAL** (crown tilted more toward the lingual – Lingual cusp is shorter - you can see buccal cusp from lingual view)
 - *EXCEPT **MAN 2nd PREMOLAR** (crown is not tilted, it is centered because Lingual cusp is same height as buccal cusp & you can barely see B cusp from lingual view)

-PROXIMAL VIEW:

- ALL premolars have a **MMR that is more OCCLUSAL** than DMR (CANT see Occlusal surface from MMR – MESIAL cusp of crown is taller/longer than the distal cusp on crown)
 - *EXCEPT **MAN 1st premolar** (MMR is MORE CERVICAL - because the Lingual cusp is smaller/shorter and is nonfunctional)
- ALL 1st premolars** (MAX & MAN) have **MESIAL&DISTAL ROOT DEPRESSIONS**, deeper depression on DISTAL
- ALL 2nd premolar** (MAX & MAN) have **DISTAL ROOT DEPRESSION ONLY** (same on MAX)

SIMILARITIES BETWEEN ALL PREMOLARS AND ANTERIOR TEETH!

- ALL premolar **CROWNS taper toward the LINGUAL** (tilted toward Lingual side)
 - *EXCEPT **MAN 2nd Premolar** (crown is centered, no tilt toward lingual)
- ALL premolars have a **similar CEJ** (except with less curve)
- ALL premolars have **CONVEX ROOTS on F & L** sides & **taper narrower at apex of root**

Similarities in how premolars all DIFFER from anterior teeth!

- ALL premolars have 2-3 **OCCLUSAL CUSPS** rather than incisal edges
- ALL premolars have **more HORIZONTAL MARGINAL RIDGES** than anterior teeth
 - *EXCEPT **1st MAN 1st PREMOLAR (ROUNDED MARGINAL RIDGES)**
- ALL premolars have **SHORTER CROWNS** than anterior teeth
- ALL have **similar ROOT** and anterior teeth don't.
- ALL have **FACIAL HEIGHT OF CONTOUR** in **CERVICAL 1/3 (FC)**
- ALL have **LINGUAL HEIGHT OF CONTOUR** in **MIDDLE 1/3 (LM = Lingual. Middle = Lizzie Marie)**
- ALL have **CONTACT AREA more CERVICAL** than anterior teeth (because crowns are shorter)

ARCH TRAITS THAT DISTINGUISH MAX FROM MAN PREMOLARS

(DIFFERENCES B/W MAX AND MAN PREMOLARS)

- MAX premolars have **SLIGHTLY LONGER BUCCAL CUSP** than LINGUAL CUSP
- MAN premolars have **MUCH LONGER BUCCAL CUSP** than LINGUAL CUSP
- MAX premolars are more **SIMILAR in SHAPE**
- MAN premolars **DIFFER in SHAPE** (due to MAN 2nd premolar having 2-3 cusps)

-BUCCAL VIEW:

- MAX premolars have **a LARGER BUCCAL RIDGE PROMINENCE** (it is wider) (makes sense because MAX premolars are larger, so buccal ridge would be wider)
- MAN premolars have **a SMALLER BUCCAL RIDGE PROMINENCE** (more narrow) (MAN premolars are smaller, so they would have smaller buccal ridge)

-OCCLUSAL VIEW:

- MAX premolars have **FL crown surface MUCH GREATER** than **MD** surface.
- MAN premolars have a **FL crown surface that is SLIGHTLY GREATER** than the **MD** (making it closer to a SQUARE SHAPE from the occlusal view)

MAXILLARY PREMOLARS

(MAX 1st from MAX 2nd)

SIMILARITIES:

-BUCCAL VIEW

-Both have **DISTAL CONTACT** in **CERVICAL 1/3** & **MESIAL CONTACT** in **MIDDLE 1/3**

-LINGUAL VIEW

-both have a **SHORTER LINGUAL CUSP** than buccal cusp (but **more so on max 1st**)

-BOTH have a **LINGUAL CUSP TIP** positioned **MESIALLY to the Midroot axis** (Lingual cusp tip is more toward the mesial side of the apex of the root)

-BOTH have a **DMR more cervical** than MMR (distal cusp gets shorter the more posterior the tooth is)

-PROXIMAL VIEW:

-BOTH have a **TRAPEZOID** outline from the **proximal** view (4 sides)

-Both have a **shorter lingual cusp** than **buccal cusp** (**BUT more so on the max 1st premolar**)

-Both have **FACIAL** Height of contour in **CERVICAL 1/3** (FC)

-BOTH have **LINGUAL** height of contour **MIDDLE 1/3** (LM)

-BOTH have **same distance between cusps**

-BOTH have **BUCCAL AND LINGUAL CUSPS** located directly over Root(CUSPS **EXTEND WITHIN THE ROOT**)

-BOTH have **MORE CEJ** curve on **MESIAL** than distal (about 1 mm >) (ALL TEETH)

-BOTH have **CEJ more occlusal** on **LINGUAL** than buccal (Lingual cusp is shorter = more occlusal; CEJ IS CLOSER TO THE OCCLUSAL of LINGUAL CUSP)

OCCLUSAL VIEW:

-BOTH have a **GREATER FL DIMENSION** than MD dimension (by over 2 mm)

-BOTH have **MESIAL CONTACT** in junction of **BUCCAL & MIDDLE** thirds of crown

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DIFFERENCES:

-BUCCAL VIEW

- MAX 1st premolar is LARGER
- MAX 2nd premolar is SMALLER
- MAX 1st premolar has **2 ROOTS** (buccal and lingual root)
- MAX 2nd premolar has **1 ROOT**
- MAX 1st premolar **ROOTS** are more CENTRAL/very slight Distal bend
- MAX 2nd premolar **ROOT** is more bent toward the DISTAL
- MAX 1st premolar has MESIAL CUSP RIDGE **LONGER** than the DISTAL CUSP RIDGE (only premolar like this!)
- MAX 2nd premolar has MESIAL CUSP RIDGE **SHORTER** than DISTAL CUSP RIDGE
- MAX 1st premolar has **SHARP BUCCAL cusp tip**
- MAX 2nd premolar has **BLUNT BUCCAL cusp tip**
- MAX 1st premolar has **MORE PROMINENT BUCCAL RIDGE** (wider)
- MAX 2nd premolar has **LESS PROMINENT BUCCAL RIDGE** (narrower;** but still bigger than man buccal ridge prominence**)

-LINGUAL VIEW-

- MAX 1st premolar has **MUCH SHORTER LINGUAL CUSP** than **BUCCAL CUSP**
- MAX 2nd premolar has **SLIGHT SHORTER LINGUAL CUSP** than **BUCCAL CUSP** (not as much as 1st)

- MAX 1st premolar has a **BLUNT LINGUAL cusp tip**
- MAX 2nd premolar has a **SHARP LINGUAL cusp tip**

***OPPOSITE OF BUCCAL CUSP TIPS!!!!!!**

-PROXIMAL VIEWS:

- MAX 1st premolar has a **CROWN DEPRESSION** on the **MESIAL** (only premolar like this)
- MAX 2nd premolar **DOES NOT** have crown depression on the mesial
- MAX 1st premolar has **ROOT DEPRESSIONS** on **M&D**
- MAX 2nd premolar only has **ROOT DEPRESSION** ON **D.**

- MAX 1st premolar has a more pronounced **Root depression** on **MESIAL** (only premolar like this)
- MAX 2nd premolar has a more pronounced **Root Depression** on **DISTAL**
- MAX 1st premolar has a **crown depression & root depression that JOIN on MESIAL** (only premolar like this)
- MAX 2nd premolar **DOES NOT!**
- MAX 1st premolar has a **SHORTER** LINGUAL CUSP than BUCCAL CUSP (more so on 1st)
- MAX 2nd premolar has a **SHORT LINGUAL CUSP** than BUCCAL CUSP
- MAX 1st premolar has **MR GROOVE on the MMR**
- Max 2nd premolar does **NOT** usually have MR GROOVE

-OCCLUSAL:

- MAX 1st premolar is LARGER
- MAX 2nd premolar is SMALLER
- MAX 1st premolar has **MORE ANATOMY**
- MAX 2nd premolar has **LESS ANATOMY**
- MAX 1st premolar has **CENTRAL GROOVE** that is **LONGER** (bigger tooth = longer central groove)
- MAX 2nd premolar has **CENTRAL GROOVE** THAT IS **SHORTER** (smaller tooth= smaller central groove)
- MAX 1st premolar has **FEW SUPPLEMENTAL/minor GROOVES**
- MAX 2nd premolar has **MORE SUPPLEMENTAL/minor GROOVES** - “extra grooves”
- MAX 1st premolar has **MORE PROMINENT BUCCAL RIDGE** (wider) (bigger tooth=bigger buccal ridge)
- MAX 2nd premolar has **LESS prominent buccal ridge** (narrower) (smaller tooth = smaller buccal ridge)
- MAX 1st premolar outline is more **ASYMMETRICAL** (not equal on both sides)
- MAX 2nd premolar is more **SYMMETRICAL** (R&L sides are mirror imaged)
- MAX 1st premolar has **DISTAL CONTACT** is more **FACIAL 1/3** than the Mesial Contact (only tooth with longer DCR ; SO IT WILL HAVE A MORE FACIAL CONTACT on distal)
- MAX 2nd premolar has **DISTAL CONTACT** is more **LINGUAL 1/3** than the Mesial Contact

MANDIBULAR PREMOLARS

(DISTINGUISHING MAN 1st from MAN 2nd)

SIMILARITIES:

-BUCCAL VIEW:

- BOTH have **roots that taper to apex** (get smaller toward apex) (ALL premolars)
- BOTH likely to have **DISTAL bend / DILASERATION at the apex of root** more Common (BUT 2nd has more prominent distal bend)
- BOTH have **SHORTER LINGUAL CUSP** than Buccal cusp (BUT 1st premolar is MUCH SHORTER) (ALL premolars)
- BOTH **MAN 1st and MAN 2nd 2 CUSP TYPE** have **CROWNS** that **TILT TOWARD LINGUAL** (not for 3 cusp type)

-PROXIMAL VIEW:

- BOTH have **BUCCAL CUSP TIP** tilted more toward **LINGUAL** (not to be confused w/ Lingual cusp tip)
- BOTH have a **RHOMBOID CROWN SHAPE** from the **PROXIMAL** view (due to LARGE CERVICAL HOC on FACIAL)
- BOTH have **BUCCAL HOC** in **CERVICAL THIRD** from proximal view (**FC**)
- BOTH have **LINGUAL HOC** in **MIDDLE THIRD** from proximal view (**LM**)
- BOTH have **BUCCAL HOC WITHIN** root outline
- BOTH have **LINGUAL HOC BEYOND** root outline
- BOTH have **MORE CEJ CURVATURE** on **MESIAL** than Distal (**ALL PREMOLARS- 1mm >**)
- BOTH have **LINGUAL CEJ** more towards the **OCCLUSAL** than Buccal (BUCCAL CEJ curves downward more towards ROOT) (ALL PREMOLARS)

DIFFERENCES:

- MAN 1st premolar has **2 cusps** (1 buccal & 1 lingual)
- MAN 2nd premolar has **2 or 3 CUSPS** (1 buccal & 1 lingual OR 1 buccal and 2 lingual)
- MAN 1st premolars are usually **EXTRACTED** in orthodontics (due to nonfunctional cusp)
- MAN 2nd premolars are usually **KEPT** in orthodontics

-BUCCAL VIEW:

-MAN 1st premolar is **LONGER**
-MAN 2nd premolar is **SHORTER**

-MAN 1st premolar has **SHARPER BUCCAL cusp tip**
-MAN 2nd premolar has **BLUNT BUCCAL cusp tip**

-MAN 1st premolar has **MORE CURVED CEJ on MD**
-MAN 2nd premolar is **LESS CURVED CEJ on MD** (general rule – CEJ less curved the more posterior you go)

-MAN 1st premolar has MESIAL CONTACT more **CERVICAL** (only tooth like this! – due to nonfunctional cusp)

-MAN 2nd premolar has MESIAL CONTACT more **OCCLUSAL**

-MAN 1st premolar has **BUCCAL RIDGE DEPRESSION** prominent on **MESIAL**
-MAN 2nd premolar has **BUCCAL RIDGE DEPRESSION** prominent on **DISTAL**

-LINGUAL VIEW:

-MAN 1st premolar has **1 LINGUAL CUSP**
-MAN 2nd premolar has **1 or 2 LINGUAL CUSPS**

-MAN 1st premolar has **CROWN** that **TAPERS TOWARD LINGUAL**
-MAN 2nd premolar has **CROWN** that **DOES NOT taper toward LINGUAL** (only one!)

-MAN 1st premolar has **LINGUAL CUSP is MUCH SHORTER** than buccal cusp & IN **NONFUNCTIONAL**
-MAN 2nd premolar has **LINGUAL CUSP that is SLIGHTLY SHORTER** than buccal cusp & IS **FUNCTIONAL**

-MAN 1st premolar **LINGUAL CUSP is CENTERED to MIDROOT AXIS**
-MAN 2nd premolar **LINGUAL CUSP is more MESIAL to MIDROOT AXIS** (more of the lingual cusp is on the mesial)

-MAN 1st premolar to have **MMR** more **CERVICAL** (closer to CEJ) than DMR. (because LINGUAL CUSP IS SHORTER! ONLY tooth like this)
-MAN 2nd premolar has **MMR** more **OCCLUSAL** than DMR

PROXIMAL VIEW:

-MAN 1st premolar **CROWN TILTS MORE TOWARD LINGUAL**
-MAN 2nd premolar **2 CUSP TYPE CROWN TILTS SLIGHTLY TOWARD LINGUAL**
-MAN 2nd premolar **3 CUSP TYPE does NOT TILT TOWARD LINGUAL**

-MAN 1st premolar has **MMR** that **slopes at 45 deg angle** (almost parallel to triangular ridge)
-MAN 2nd premolar **DOES NOT**

-MAN 1st premolar has **VERY SHORT LINGUAL TRIANGULAR RIDGE** (lingual cusp is very small & short)
-MAN 2nd premolar **LONGER LINGUAL TRIANGULAR RIDGE** (it has 2-3 lingual cusps)

-MAN 1st premolar has **ML GROOVE** (because only 1 lingual cusp that is short and has 45 deg angle)
-MAN 2nd Premolar **DOES NOT** have ML groove (2 or 3 lingual cusps that are larger)

- MAN 1st premolar has **MESIAL&DISTAL ROOT DEPRESSIONS**, deeper depression on DISTAL
- MAN 2nd premolar has **DISTAL ROOT DEPRESSION ONLY**

*EXCEPTIONS -

***WHEN MAN 2nd premolar has 3 cusp type (2 lingual CUSPS), the ML cusp is WIDER & LONGER than DL**

OCCLUSAL VIEWS:

- MAN 1st premolar has **DIAMOND SHAPED OUTLINE**
- MAN 2nd premolar w/ **2 CUSPS** has **ROUND/OVAL OUTLINE**
- MAN 2nd premolar w/ **3 CUSPS** has **SQUARE OUTLINE**
- MAN 1st premolar has **FLAT/PUSHED IN MESIOLINGUAL CORNER**
- MAN 2nd premolar is **ROUNDED** on **MESIOLINGUAL CORNER**
- MAN 1st premolar has more **BULK of CROWN in DISTAL HALF**
- MAN 2nd premolar has **SYMMETRICAL MESIAL & DISTAL HALVES**
- MAN 1st premolar has **TRANSVERSE RIDGE** that **separates** M & D fossa
- MAN 2nd premolar 2 CUSP TYPE has **NO TRANSVERSE RIDGE**
- MAN 2nd premolar 3 CUSP TYPE has **NO TRANSVERSE RIDGE**
- MAN 1st premolar has **NO CENTRAL GROOVE**
- MAN 2nd premolar 2 CUSP TYPE **HAS A CENTRAL GROOVE** that **connects** M& D fossa
- MAN 2nd premolar 3 CUSP TYPE **HAS A CENTRAL GROOVE** that **connects** M&D fossa w/ **CENTRAL PIT**
- MAN 1st premolar has **NO LINGUAL GROOVE** (has transverse ridge)
- MAN 2nd premolar 2 CUSP TYPE has **NO LINGUAL GROOVE** (has a central groove)
- MAN 2nd premolar 3 CUSP TYPE **HAS A LINGUAL GROOVE** (forms a Y pattern) – **it separates the 2 lingual cusps**
- MAN 1st premolar has **GROOVE PATTERN** that is **SNAKE EYES (M&D pits)**
- MAN 2nd premolar 2 CUSP TYPE has **GROOVE PATTERN** that is either **U or H**
- MAN 2nd premolar 3 CUSP TYPE has **GROOVE PATTERN THAT IS A Y-shape**