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Essentials of Dental Anatomy & Oral Histology

THIRD EDITION



Kabita Chatterjee

JAYPEE

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CHAPTER 2

The Deciduous (Primary) Teeth

The deciduous (primary) dentition comprises of 20 teeth, 5 in each quadrant of both jaws. These are central incisor, lateral incisor, canine, first molar, and second molar. Premolars are absent in primary set of dentition. The deciduous teeth start erupting at the age of 6 months. Eruption and root completion of all deciduous teeth are completed at about 3 years of age. Permanent teeth start replacing them at the age of 6 years and the replacement is completed by the age of 12 years. The general order of eruption of the primary dentition is central incisor, lateral incisor, first molar, canine, and second molar, with mandibular pairs preceding the maxillary teeth. The second molar in both the arches and the maxillary incisors appears to be the most unstable of the primary teeth.

IMPORTANCE OF DECIDUOUS TEETH

Though the deciduous teeth are present in the oral cavity for a shorter period of time, they serve a number of purposes. So the maintenance of normal anatomy of deciduous teeth and their supporting structures is as important as their permanent counterpart **(Table 2.1)**.

TABLE 2.1: Major contrasts between primary and permanent teeth.

	Permanent	*Deciduous*
1. Number	32	20
2. Types	Two incisors, one canine, two premolars, and three molars in each quadrant	Two incisors, one canine, and two molars in each quadrant. Premolars are absent
3. Size	Larger than deciduous teeth	Smaller than permanent teeth. Crowns are relatively short as compared to roots. The mesiodistal width of molar is greater than that of succeeding premolar. The combined width of deciduous canine and first and second deciduous molars is greater than the combined width of permanent canine and first and second premolars. This difference of 1.7 mm in the lower arch and 0.9 mm in the upper arch is known as Leeway space of Nance. This extra space is used in the adjustment of occlusion
4. Shape	The cusps are blunt. The crowns are not bulbous. The contact areas are broader.	The cusps are more pointed and the crowns are bulbous. The crowns of anterior teeth are wider mesiodistally. The contact areas are smaller
5. Color	They are bluish-white in color as enamel is more translucent	They are whiter and less pigmented as enamel is less translucent
6. Cervical margin	The enamel ends gradually. First molars do not have any bulge near cervical margins. Necks are longer and less constricted	The enamel ends abruptly at the neck. First molars show a bulge near the cervical margin at mesiobuccal region, known as cervical ridge. Necks are short and more constricted. The cervical ridges of enamel of the anterior teeth are more prominent
7. Occlusal surface	Buccal and lingual surfaces of molars are not convergent occlusally. Therefore, buccolingual diameter is wider	Buccal and lingual surfaces of molars are convergent occlusally. Therefore, buccolingual diameter is narrower

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	Permanent	*Deciduous*
8. Roots	Roots are longer and strong. In multirooted teeth, there is a trunk and roots do not diverge close to crown	Roots are shorter and slender, though compared to crown size they are relatively longer. The roots diverge close to crown. The roots flare widely beyond outlines of crown and allow more room between roots for development of permanent tooth crown
9. Pulp cavity	Dentin is thicker. Pulp chamber is smaller and pulp horns are at lower level	Dentin is less thick. Pulp chamber is larger and pulp horns rise high in the cuspal region
10. Enamel	Enamel is less permeable, more calcified, and shows relatively less attrition. Rods near cervical margin are directed apically	Enamel is relatively thin, more permeable, less calcified, and shows relatively more attrition. Rods near cervical margin are perpendicular to dentinoenamel junction
11. Eruption and shedding	Eruption starts at 6 years and continues till 25 years or more and stays in oral cavity for a long time	Eruption starts at 6 months and continues till 3 years and are exfoliated by 13 years
12. Placement in jaws	They are placed obliquely in jaws	They are set perpendicularly in jaws
13. First upper molar	It has four cusps	It has three cusps
Second upper molar	It has four cusps	It has four cusps
First lower molar	It has five cusps	It has four cusps
Second lower molar	It has four cusps	It has five cusps

- They help in mastication.
- They are important for development of speech.
- They contribute for growth of jaw bones.
- They maintain the space needed for the development and eruption of the permanent teeth.

THE DECIDUOUS INCISORS (TABLES 2.2 AND 2.3)

The Deciduous Maxillary Central Incisor (Figs. 2.1A to E) (Table 2.4)

Labial Aspect (Fig. 2.1A)

- In the crown of the deciduous central incisor, the mesiodistal diameter is greater than the cervicoincisal length (the opposite is true of permanent central incisors).
- The labial surface is smooth without any grooves or lobes. It is slightly convex in both directions.
- The incisal edge is nearly straight.
- Developmental lines are usually not seen.
- It has a prominent cervical ridge.
- The root is cone-shaped with even and tapered sides. The root length is greater in comparison with the crown length than that of the permanent central incisor.

Lingual Aspect (Fig. 2.1B)

- The lingual aspect of the crown shows well-developed marginal ridges and a highly developed cingulum. The cingulum extends up toward the incisal ridge to

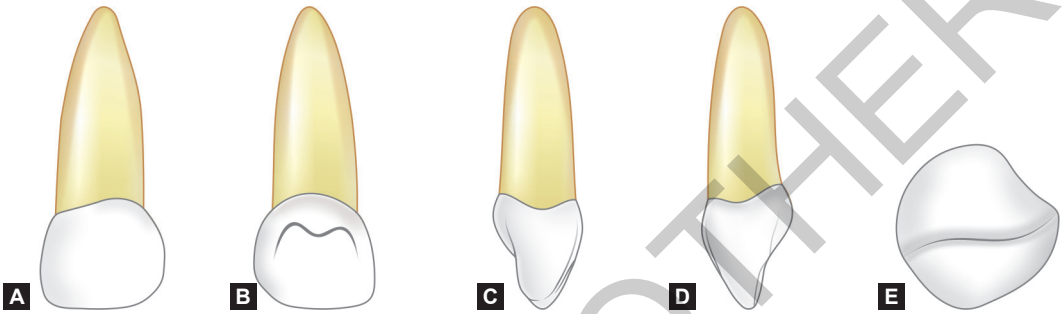
TABLE 2.2: Chronology of tooth formation and eruption of deciduous incisors.

	Maxillary central	*Incisor lateral*	*Mandibular central*	*Incisor lateral*
1. Initiation of calcification (month in utero)	3	4	4	4
2. Crown completion (month)	4	5	4	4
3. Eruption (month)	7	8	6	7
4. Root completion (year)	1½–2	1½–2	1½–2	1½–2

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TABLE 2.3: Measurement table of the deciduous incisors.

	Maxillary central	*Incisor lateral*	*Mandibular central*	*Incisor lateral*
1. Total length (mm)	16.0	15.8	14.0	15.0
2. Height of the crown (mm)	6.0	5.6	5.0	5.2
3. Length of the root (mm)	10.0	10.2	11.0	9.8
4. Mesiodistal crown diameter (mm)	6.5	5.1	4.2	4.1
5. Labiolingual crown diameter (mm)	5.0	4.0	4.0	4.0



Figs. 2.1A to E: Deciduous maxillary left central incisor: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

TABLE 2.4: Differences between deciduous maxillary and mandibular incisors.

Maxillary	*Mandibular*
1. Mesiodistal diameter of the crown is greater than cervicoincisal height	1. Cervicoincisal height of the crown is greater than the mesiodistal
2. Larger than the lower incisors	2. Smaller than the upper incisors

make a partial division of the concavity on the lingual surface below the incisal edge, dividing it into a mesial and distal fossa.

- The cervical line appears constricted from all sides.
- The root narrows lingually and presents a ridge for its full length in comparison with a flatter surface labially. A cross section through the root at cervix appears triangular in shape, with the labial surface making one side of the triangle and mesial and distal surfaces making up the other two sides.

Mesial and Distal Aspects (Figs. 2.1C and D)

- The mesial and distal aspects of the deciduous maxillary central incisors are similar. They are smooth and convex.
- The incisal edge is straight. The mesial angle is well-defined and distal angle is rounded.
- The curvature of cervical line, which represents the cementoenamel junction, is distinct, curving toward the incisal ridge. The cervical curvature distally is less than the amount of curvature mesially.
- The root has an even taper like the shape of a long cone. It is, however, blunt at the apex. Usually, the mesial side of the root will have a developmental groove or concavity, whereas distally the surface is generally convex.

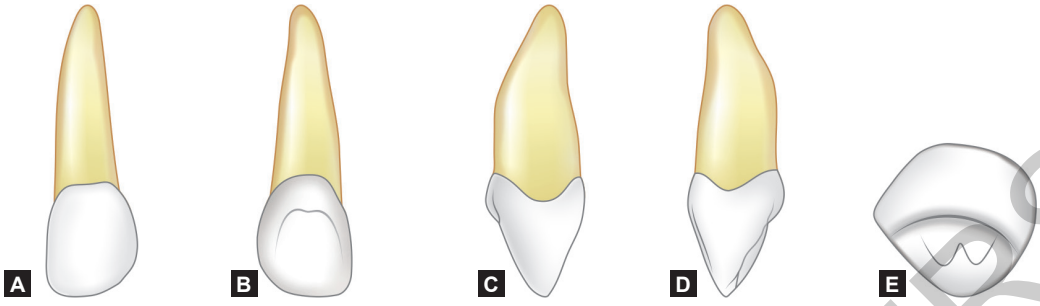
Incisal Aspect (Fig. 2.1E)

- The incisal edge is centered over the main bulk of the crown and is relatively straight.
- From this aspect, the labial surface is much broader and also smoother than the lingual surface. The lingual surface tapers toward the cingulum.

The Deciduous Maxillary Lateral Incisor (Figs. 2.2A to E) (Table 2.5)

In general, the maxillary lateral incisor is similar to the central incisor from all

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Figs. 2.2A to E: Deciduous maxillary left lateral incisor: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

TABLE 2.5: Differences between deciduous maxillary central and lateral incisors.

Maxillary central incisor	*Maxillary lateral incisor*
1. Larger than lateral incisor	1. Smaller
2. Cingulum is prominent	2. Cingulum is not prominent
3. Crown height is smaller than M-D width	3. Crown height is greater than M-D width
4. Distoincisal angle is less rounded	4. Distoincisal angle is more rounded
5. Lingual fossa is shallower	5. Lingual fossa is deeper

aspects, but it is smaller in all directions. The cervicoincisal length of the lateral crown is greater than its mesiodistal width. The distoincisal angles of the crown are more rounded than those of the central incisor. The cingulum is not prominent. The root has a similar shape, but it is much longer in proportion to its crown.

The Deciduous Mandibular Central Incisor (Figs. 2.3A to E)

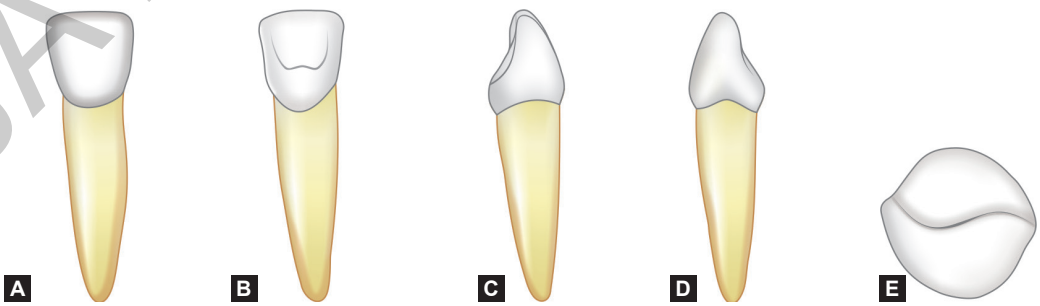
This is the smallest tooth in human dentition.

Labial Aspect (Fig. 2.3A)

- The labial aspect of this crown is smooth and convex with no developmental groves.
- The mesial and distal sides of the crown are tapered evenly from the contact areas.
- This crown is wide in proportion to its length in comparison with that of its permanent successor.
- The mesial and distal incisal angles are sharp.
- The root of the deciduous central incisor is long and is evenly tapered down to the apex, which is pointed. The root is almost twice the length of the crown.

Lingual Aspect (Fig. 2.3B)

- The marginal ridges are not well-defined and the cingulum is prominent on the lingual aspect.
- At the middle third and the incisal third of the lingual aspect, there is a shallow concavity, called the lingual fossa.
- The lingual portion of the crown and root converges so that it is narrower towards the lingual than towards the labial surface.



Figs. 2.3A to E: Deciduous mandibular left central incisor: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

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Mesial Aspect (Fig. 2.3C)

- The mesial aspect is triangular, smooth, and convex.
- The incisal ridge is centered over the center of the root and between the crest of curvature of the crown, labially and lingually. The convexity of the cervical contours labially and lingually is present at the cervical third.
- The mesial surface of the root is nearly flat and is evenly tapered.

Distal Aspect (Fig. 2.3D)

- The cervical line of the crown is less curved toward the incisal ridge than that found on the mesial surface.
- Often there is a developmental depression on the distal side of the root.

Incisal Aspect (Fig. 2.3E)

- The incisal ridge is straight and bisects the crown labiolingually.
- The mesioincisal angle is sharp and distoincisal angle is rounded. There is a definite taper toward the cingulum on the lingual side.
- The labial surface from this view presents a flat surface slightly convex, whereas the lingual surface presents a flattened surface slightly concave.
- No mamelons are present.

The Deciduous Mandibular Lateral Incisor (Figs. 2.4A to E) (Table 2.6)

- The fundamental outlines of the deciduous mandibular lateral incisor are similar to those of the deciduous central incisor, but larger in dimension.
- The cingulum of the lateral incisor may be a little more generous than that of the central incisor and the lingual surface of the crown between the marginal ridges may be more concave.
- The incisal ridge slopes downward distally. So the distal contact area is apically positioned to contact with the mesial surface of the deciduous mandibular canine.

TABLE 2.6: Differences between deciduous mandibular central and lateral incisor.

Mandibular central incisor	*Mandibular lateral incisor*
1. Smallest tooth	1. Larger than the central incisor but M-D width is narrower
2. Bilaterally symmetrical. Both mesio- and distoincisal angles are sharp	2. Not symmetrical bilaterally. Incisal margin slopes downward distally. Distoincisal angle is rounded

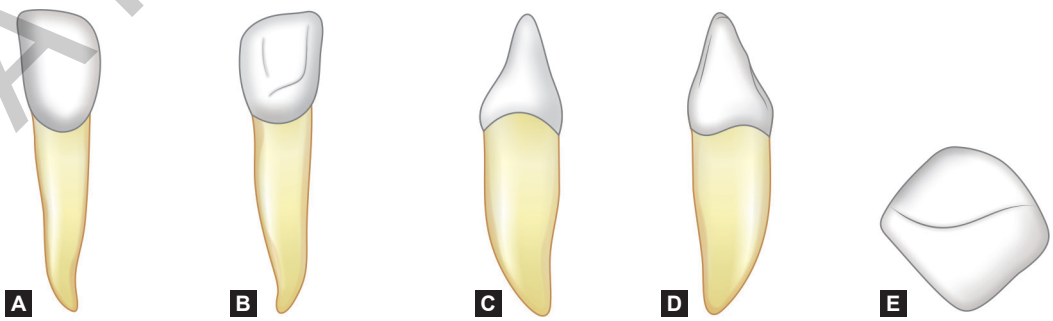
THE DECIDUOUS CANINE (TABLES 2.7 AND 2.8)

The deciduous canines resemble permanent canines. The cervical ridge is well-developed and roots are comparatively larger.

The Deciduous Maxillary Canine (Figs. 2.5A to E)

Labial Aspect (Fig. 2.5A)

- Height of the crown is shorter than the mesiodistal diameter.



Figs. 2.4A to E: Deciduous mandibular left lateral incisor: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

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TABLE 2.7: Chronology of tooth formation and eruption of deciduous canines.

	Maxillary canine	*Mandibular canine*
1. Initiation of calcification (month in utero)	5	5
2. Crown completion (month)	9	9
3. Eruption (month)	16–20	16–20
4. Root completion (year)	2½–3	2½–3

TABLE 2.8: Measurement table of the deciduous canine.

	Maxillary canine	*Mandibular canine*
1. Total length (mm)	19.0	17.0
2. Height of crown (mm)	6.5	6.0
3. Length of root (mm)	12.5	11.0
4. Mesiodistal crown diameter (mm)	7.0	5.0
5. Labiolingual crown diameter (mm)	7.0	4.8

- The crown margins bulge proximally giving the crown a diamond shape. The crown is more constricted at the cervix in relation to its mesiodistal width. Labially, the cervical ridge is prominent.
- Instead of an incisal edge, it has a long, well-developed, and sharp cusp. Compared to the permanent maxillary canine, the cusp on the deciduous canine is much longer and sharper. A line drawn through the contact areas of the deciduous canine would bisect a line drawn from the cervix to the tip of the cusp (in the permanent canine, the contact areas are not at the same level). When the cusp is intact, the mesial slope of the cusp will be longer than the distal slope.
- The root of the deciduous canine is long, slender, and tapering and is more than twice the crown length.

Lingual Aspect (Fig. 2.5B)

- The lingual aspect shows pronounced enamel ridges that merge with each other. They are the cingulum, mesial, and distal marginal ridges, and incisal ridges, besides a tubercle at the cusp tip, which is a continuation of the lingual ridge connecting the cingulum and the cusp tip. This lingual ridge divides the lingual surface into shallow mesiolingual and distolingual fossae.
- The root of this tooth tapers lingually. It is usually inclined distally.

Mesial Aspect (Fig. 2.5C)

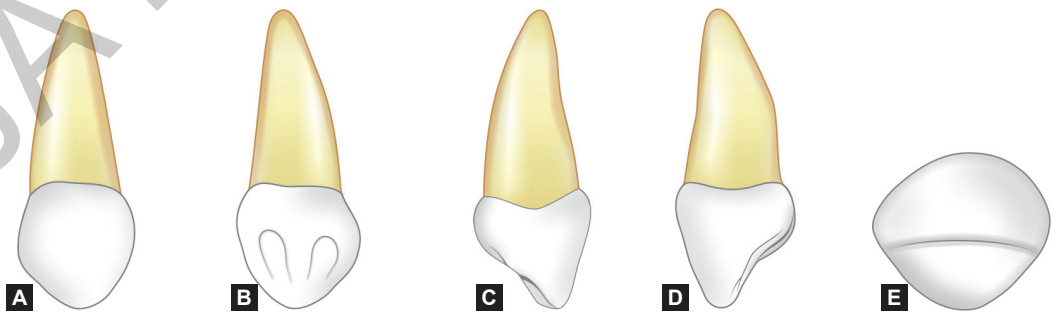
- The measurement labiolingually at the cervical third is much greater.
- The curvature of the cervical line is more than on distal surface.

Distal Aspect (Fig. 2.5D)

- The distal outline of this tooth is the reverse of the mesial aspect.
- The curvature of the cervical line toward the cusp ridge is less than on the mesial surface.

Incisal Aspect (Fig. 2.5E)

- From the incisal aspect, the crown appears diamond-shaped.



Figs. 2.5A to E: Deciduous maxillary left canine: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

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- The tip of the cusp is distal to the center of the crown, and the mesial cusp slope is longer than the distal cusp slope. This allows for intercuspation with the mandibular canine, which has its longest slope distally.

The Deciduous Mandibular Canine (Figs. 2.6A to E) (Table 2.9)

- The crown is 0.5 mm shorter and the root is at least 2 mm shorter; the mesiodistal measurement of the mandibular canine at the root trunk is greater when compared with its mesiodistal measurement at the contact areas than is the maxillary canine.

TABLE 2.9: Differences between maxillary and mandibular deciduous canines.

Maxillary	*Mandibular*
1. Total length is more	1. Total length is less
2. Crown is wider mesiodistally	2. Crown is narrower mesiodistally
3. Height of crown is shorter than M-D diameter	3. Height of crown is greater than M-D diameter
4. Wider labiolingually	4. Narrower labiolingually
5. Crown is blunt	5. Crown is more pointed
6. Cingulum is prominent	6. Cingulum is less prominent

The deciduous maxillary canine is much larger labiolingually.

- The cervical ridges labially and lingually are not as pronounced as the maxillary canine.
- The distal cusp slope is longer than the mesial slope (the opposite arrangement is true of the maxillary canine).

THE DECIDUOUS MOLARS (TABLES 2.10 AND 2.11)

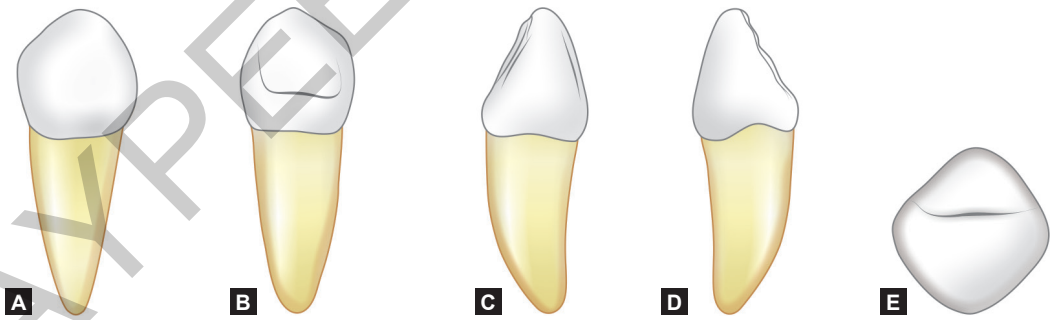
The deciduous molars are total eight in number, four in each jaw and two in each quadrant. The occlusal surfaces are narrow buccolingually. There is a prominent cervical bulge in the crown and roots are divergent.

The Deciduous Maxillary First Molar (Figs. 2.7A to E) (Table 2.12)

It is the smallest molar in the oral cavity. It appears as an intermediate between a premolar and a molar.

Buccal Aspect (Fig. 2.7A)

- The buccal aspect is smooth and convex in both directions. The mesiodistal diameter is greater than the crown height.



Figs. 2.6A to E: Deciduous mandibular left canine: (A) Labial aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Incisal aspect.

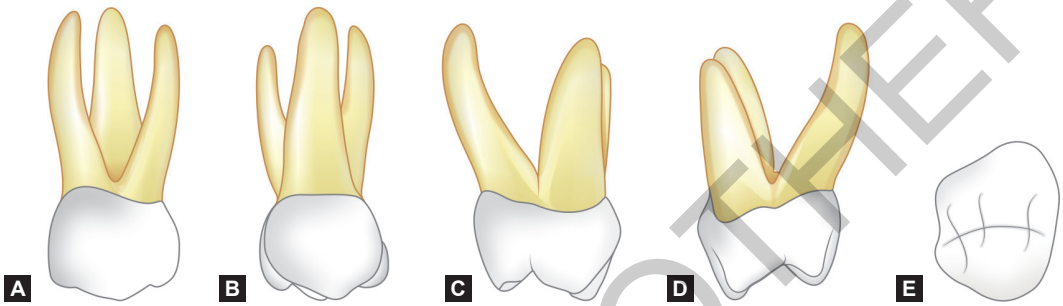
TABLE 2.10: Chronology of tooth formation and eruption of deciduous molars.

	Maxillary		*Mandibular*	
	First	*Second*	*First*	*Second*
1. Initiation of calcification (month in utero)	5	6	5	6
2. Crown completion (month)	6	12	6	12
3. Eruption (month)	12–16	20–30	12–16	20–30
4. Root completed (year)	2–2½	3	2–2½	3

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TABLE 2.11: Measurement table of the deciduous molars.

	Maxillary		*Mandibular*	
	First	*Second*	*First*	*Second*
1. Total length (mm)	15.2	17.5	15.8	18.8
2. Height of crown (mm)	5.1	5.7	6.0	5.5
3. Length of root (mm)	10.1	11.8	9.8	13.3
4. Mesiodistal crown diameter (mm)	7.3	8.2	7.7	9.9
5. Labiolingual crown diameter (mm)	8.5	10.0	7.0	8.7



Figs. 2.7A to E: Deciduous maxillary left first molar: (A) Buccal aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Occlusal aspect.

- The widest measurement of the crown is at the contact areas mesially and distally. From these points, the crown converges toward the cervix.
- The occlusal line is slightly scalloped, but there is no definite cusp form.
- The cervical ridge is well-developed and is more prominent mesially and may form a tubercle known as tubercle of Zuckerkandl.
- The cervical line is higher mesially than distally.
- The roots of the maxillary first molar are slender and long and they are divergent. The distal root is considerably shorter than the mesial one. The bifurcation of the roots begins almost immediately at the site of the cervical line (cementoenamel junction).

Lingual Aspect (Fig. 2.7B)

- The mesiodistal dimension of lingual aspect is less than buccal aspect as the crown converges in a lingual direction.
- The mesiolingual cusp is the longest and sharpest cusp on this tooth and it forms most of the occlusal border. The distolingual cusp is small and rounded.

TABLE 2.12: Differences between upper and lower deciduous molars.

Deciduous molars	
Upper	*Lower*
1. Three roots	1. Two roots
2. Two to four cusps are seen on crown	2. Four to five cusps are seen

- Some of the deciduous maxillary first molar present one large lingual cusp with no developmental groove lingually. This type is apparently a three-cusped molar.
- All three roots may be seen from this aspect. The lingual root is larger than the others.

Mesial Aspect (Fig. 2.7C)

- The dimension at the cervical third is greater than the dimension at the occlusal third.
- The buccal outline shows pronounced convexity near cervical third. The lingual outline is evenly convex from cervical to occlusal region.
- The mesiolingual cusp is longer and sharper than the mesiobuccal cusp. There

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is a pronounced convexity on the buccal outline in the cervical third.
- The cervical line mesially shows some curvature in the direction of the occlusal surface.
- The mesiobuccal and lingual roots are visible from the mesial side of this tooth. The distobuccal root is hidden behind the mesiobuccal root. The lingual root from this aspect looks long and slender and extends lingually to a marked degree. It curves sharply in a buccal direction above the middle third.

Distal Aspect (Fig. 2.7D)

- From the distal aspect, the crown is narrower distally than mesially and it tapers markedly toward the distal.
- The distobuccal cusp is long and sharp and the distolingual cusp is poorly developed.
- The prominent bulge seen from the mesial aspect at the cervical third does not continue distally. The cervical line may curve occlusally, or it may extend straight across from the buccal surface to the lingual surface.
- All three roots may be seen from this angle, but the distobuccal root is superimposed on the mesiobuccal root so that only the buccal surface and the apex of the later may be seen. The point of bifurcation of the distobuccal root and the lingual root is near the cementoenamel junction.

Occlusal Aspect (Fig. 2.7E)

- The surface is trapezoidal in shape with shortest sides represented by marginal ridges. The mesial and distal surfaces are straight and converge lingually. The calibration from the mesiobuccal line angle to the mesiolingual line angle is greater than that found at the distal line angles. Therefore, the crown converges distally also.
- The occlusal surface has a central fossa. There is a mesial triangular fossa, just inside the mesial marginal ridge, with a mesial pit in this fossa and a sulcus with its central groove connecting the two fossae. There is also a well-defined buccal developmental groove dividing the mesiobuccal cusp and the distobuccal cusp occlusally. There are supplemental grooves radiating from the pit in the mesial triangular fossa. These grooves radiate as follows: one buccally, one lingually, and one toward the marginal ridge, the last sometimes extending over the marginal ridge mesially.
- Sometimes the deciduous maxillary first molar has a well-defined triangular ridge connecting the mesiolingual cusp with the distobuccal cusp. When well-developed, it is called the oblique ridge. In some of these teeth, the ridge will be very indefinite and the central development groove will extend from the mesial pit to the distal developmental groove. This distoocclusal groove is always seen and may or may not extend through to the lingual surface, outlining a distolingual cusp. The distal marginal ridge is thin and poorly developed in comparison with the mesial marginal ridge.

The Deciduous Maxillary Second Molar (Figs. 2.8A to E) (Table 2.13)

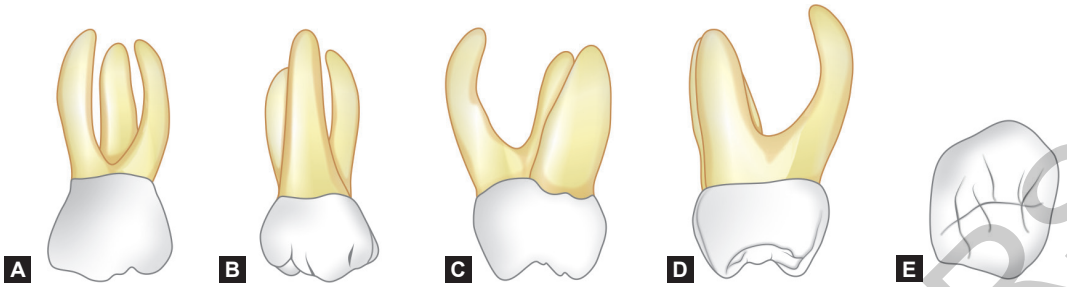
Buccal Aspect (Fig. 2.8A)

- The deciduous maxillary second molar resembles the permanent maxillary first molar, but it is smaller.
- There are two well-defined buccal cusps with a buccal developmental groove between them. The crown is narrow at the cervix in comparison with its mesiodistal measurement at the contact areas. There is a well-developed cervical ridge.
- The roots are much longer and heavier compared to that of the maxillary first molar. The point of bifurcation between the buccal roots is close to the cervical line of the crown.

Lingual Aspect (Fig. 2.8B)

Lingually, the crown shows three cusps: (1) the mesiolingual cusp, which is large and

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Figs. 2.8A to E: Deciduous maxillary left second molar: (A) Buccal aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Occlusal aspect.

TABLE 2.13: Differences between maxillary deciduous first and second molars.

Maxillary deciduous molar	
First	***Second***
1. Smaller	1. Larger
2. It has two to three cusps	2. It has four cusps
3. It looks like an intermediate between premolar and permanent molar. Basically, it resembles a premolar	3. It resembles permanent first molar

well-developed, (2) the distolingual cusp, which is also well-developed, and (3) a third supplemental cusp, which is apical to the mesiolingual cusp and is called the tubercle of Carabelli, or the fifth cusp.

This cusp is poorly developed and merely acts as a supplement to the bulk of the mesiolingual cusp.

- A well-defined developmental groove separates the mesiolingual cusp from the distolingual cusp and connects with the developmental groove, which outlines the fifth cusp.
- All three roots are visible from this aspect; the lingual root is large and thick in comparison with the other two roots.

Mesial Aspect (Fig. 2.8C)

- The mesiolingual cusp of the crown with its supplementary fifth cusp appears large in comparison with the mesiobuccal cusp. The mesiobuccal cusp from this angle is relatively short and sharp. There is very little curvature to the cervical line. Usually, it is almost straight across from the buccal surface to lingual surface.
- The mesiobuccal root from this aspect is broad and flat. The lingual root has somewhat the same curvature as the lingual root of the maxillary first deciduous molar. The mesiobuccal root extends lingually far out beyond the crown outline. The point of bifurcation between the mesiobuccal root and the lingual root is 2 or 3 mm apical to the cervical line of the crown.

Distal Aspect (Fig. 2.8D)

- From the distal aspect, the lingual outline is smooth and rounded but the buccal outline is almost straight from the crest of curvature to the tip of the buccal cusp. The distobuccal cusp and the distolingual cusp are about the same in length.
- The cervical line is approximately straight, as was found mesially.
- All three roots are seen from this aspect, although only a part of the outline of the mesiobuccal root may be seen, since the distobuccal root is superimposed over it. The distobuccal root is shorter and narrower than the other roots. The point of bifurcation between the distobuccal root and the lingual root is more apical in location than any of the other points of bifurcation.

Occlusal Aspect (Fig. 2.8E)

- From the occlusal aspect, this tooth resembles the permanent first molar. It is somewhat rhomboidal and has four well-developed cusps and one supplemental cusp—mesiobuccal, distobuccal,

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mesiolingual, distolingual, and fifth cusps. The buccal surface is rather flat, with the developmental groove between the cusps less marked than that found on the first permanent molar. Developmental grooves, pits, oblique ridge, and so forth, are almost identical.

- The occlusal surface has a central fossa with a central pit, a well-defined mesial triangular fossa, just distal to the mesial marginal ridge, with a mesial pit at its center. There is a well-defined developmental groove called the central groove at the bottom of a sulcus connecting the mesial triangular fossa with the central fossa. The buccal developmental groove extends buccally from the central pit, separating the triangular ridges, which are occlusal continuations of the mesio- and distobuccal cusps. Supplemental grooves often radiate from these developmental grooves.
- The oblique ridge is prominent and connects the mesiolingual cusp with the distobuccal cusp. Distal to the oblique ridge, there is the distal fossa, which harbors the distal developmental groove. The distal groove has branches of supplemental grooves within the distal triangular fossa.
- The distal groove acts as a line of demarcation between the mesiolingual and distolingual cusps and continues on to the lingual surface as the lingual developmental groove. The distal marginal ridge is as well-developed as the mesial marginal ridge.

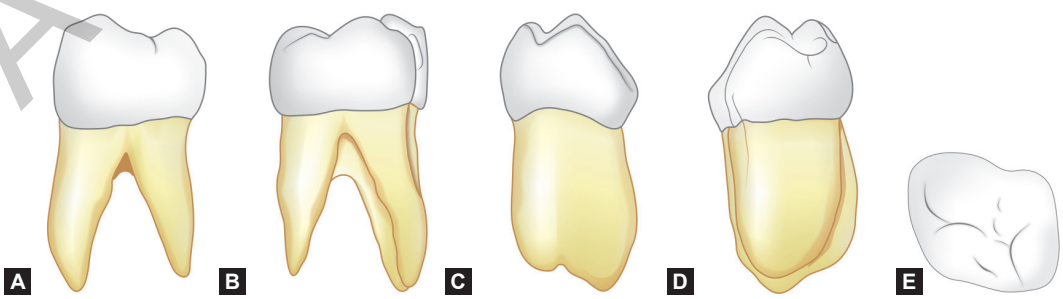
The Deciduous Mandibular First Molar (Figs. 2.9A to E)

Buccal Aspect (Fig. 2.9A)

- From the buccal aspect, the mesial outline of the crown of the deciduous mandibular first molar is almost straight from the contact area to the cervix. The distal outline converges more toward the cervix, making the contact area extend distally to a marked degree.
- The distal portion of the crown is shorter than the mesial portion, the cervical line dipping apically where it joins the mesial root.
- The two buccal cusps are rather distinct and there is no developmental groove between them. The mesial cusp is larger than the distal cusp. There is a developmental depression dividing them (not a groove), which extends over to the buccal surface.
- The roots are long and slender and they spread greatly at the apical third beyond the outline of the crown. From the buccal aspect, if a line is drawn from the bifurcation of the roots to the occlusal surface, the tooth will be evenly divided mesiodistally.

Lingual Aspect (Fig. 2.9B)

- The crown and root converge lingually to a marked degree on the mesial surface. The distolingual cusp is rounded and suggests a developmental groove between this cusp and the mesiolingual cusp.



Figs. 2.9A to E: Deciduous mandibular left first molar: (A) Buccal aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Occlusal aspect.

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- The mesiolingual cusp is long and sharp at the tip. The sharp and prominent mesiolingual cusp (almost centered lingually but in line with the mesial root) is an outstanding characteristic found occlusally on the deciduous first mandibular molar.
- The mesial marginal ridge is well-developed.

Mesial Aspect (Fig. 2.9C)

- The buccal cusps are placed over the root base, and the lingual outline of the crown extends out lingually beyond the confines of the root base.
- Both the mesiobuccal cusp and the mesiolingual cusp are visible from this aspect. The mesial marginal ridge is well-developed. All of the deciduous molars have flattened buccal surfaces above this cervical ridge.
- The buccal and lingual outlines of the root drop straight down from the crown and are approximately parallel for over half their length, tapering only slightly at the apical third. A developmental depression usually extends almost the full length of the root on the mesial side.

Distal Aspect (Fig. 2.9D)

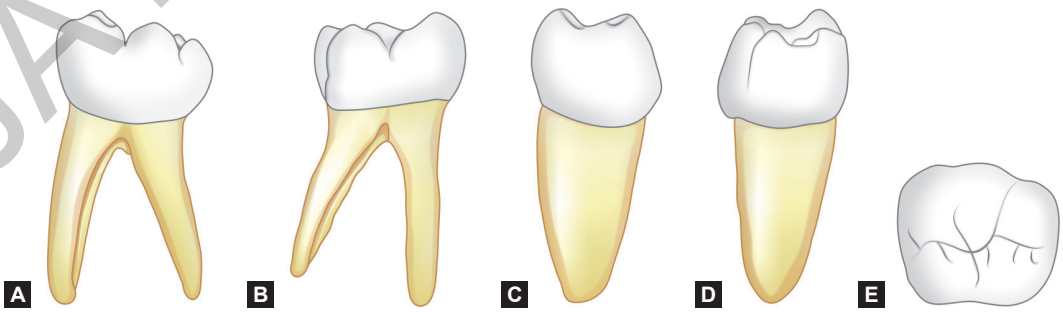
- The length of the crown buccally and lingually is more uniform and the cervical line extends almost straight across buccolingually.
- The distobuccal cusp and the distolingual cusp are not as long or as sharp as the two mesial cusps.
- The distal marginal ridge is not as straight and well-defined as the mesial marginal ridge.
- The distal root is rounder and shorter and tapers more apically.

Occlusal Aspect (Fig. 2.9E)

- The general outline of this tooth from the occlusal aspect is rhomboidal.
- The mesiolingual cusp is the largest and the best developed of all the cusps and it has a broad flattened surface lingually.
- The *buccal developmental groove* of the occlusal surface divides the two buccal cusps evenly and extends to the center of the crown at a central pit. The central developmental groove joins it at this point and extends mesially, separating the mesiobuccal cusp and the mesiolingual cusp. The central groove ends in a mesial pit in the mesial triangular fossa, which is immediately distal to the mesial marginal ridge.
- The mesiobuccal cusp exhibits a well-defined triangular ridge on the occlusal surface, which terminates in the center of the occlusal surface buccolingually at the central developmental groove. The lingual developmental groove extends lingually from this point, separating the mesiolingual cusp and the distolingual cusp.

The Deciduous Mandibular Second Molar (Figs. 2.10A to E) (Table 2.14)

The deciduous mandibular second molar resembles the permanent mandibular first molar.



Figs. 2.10A to E: Deciduous mandibular left second molar: (A) Buccal aspect; (B) Lingual aspect; (C) Mesial aspect; (D) Distal aspect; (E) Occlusal aspect.

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TABLE 2.14: Differences between mandibular deciduous first and second molars.

Mandibular deciduous molar	
First	***Second***
1. Smaller	1. Larger
2. Has four cusps	2. Has five cusps
3. Does not resemble any permanent tooth	3. Resembles permanent first molar

Buccal Aspect (Fig. 2.10A)

- From the buccal aspect, the mesiobuccal and distobuccal developmental grooves divide the buccal surface of the crown occlusally into a mesiobuccal, a buccal, and a distobuccal cusp.
- The roots of the deciduous second molar from this angle are slender and long. They have a characteristic flare mesiodistally at the middle and apical thirds. The roots of this tooth may be twice as long as the crown.
- The point of bifurcation of the roots starts immediately below the cementoenamel junction of crown and root.

Lingual Aspect (Fig. 2.10B)

- From the lingual aspect, two cusps are of almost equal dimensions. Between them, there is a short lingual groove. The two lingual cusps are not quite as wide as the three buccal cusps and thus narrow the crown lingually.
- The cervical line is relatively straight.
- The mesial portion of the crown appears little higher than the distal portion of the crown when viewed from the lingual aspect.
- The roots from this aspect give somewhat the same appearance as from the buccal aspect.

Mesial Aspect (Fig. 2.10C)

- The crest of contour buccally is more prominent on the deciduous molar, and the tooth seems to be more constricted occlusally because of the flattened buccal surface above this cervical ridge.
- The marginal ridge is high, a characteristic that makes the mesiobuccal cusp and the mesiolingual cusp appear rather short. The lingual cusp is longer or extends higher at any rate than the buccal cusp.
- The cervical line is regular, although it extends upward buccolingually.
- The mesial root is unusually broad and flat with a blunt apex.

Distal Aspect (Fig. 2.10D)

- The crown is not as wide distally as it is mesially.
- The distolingual cusp appears well developed and the triangular ridge from the tip of this cusp extending down into the occlusal surface is seen over the distal marginal ridge.
- The distal marginal ridge dips down more sharply and is shorter buccolingually than the mesial marginal ridge. The cervical line of the crown is regular, although it has the same upward incline buccolingually on the distal as on the mesial.
- The distal root is almost as broad as the mesial root and it is flattened on the distal surface. The distal root tapers more at the apical end than does the mesial root.

Occlusal Aspect (Fig. 2.10E)

- The occlusal aspect of the deciduous mandibular second molar is somewhat rectangular. The three buccal cusps are similar in size. The two lingual cusps are also equally matched.
- There are well-defined triangular ridges extending occlusally from the cusp tips. The triangular ridges end in the center of the crown buccolingually in a central developmental groove that extends from the mesial triangular fossa, just inside the mesial marginal ridge, to the distal triangular fossa, just mesial to the distal marginal ridge. The two buccal grooves are confluent with the buccal developmental grooves of the buccal surface, one mesial and one distal, and the single lingual developmental groove is confluent with

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the lingual groove on the lingual surface of the crown.

- The mesial marginal ridge is better developed and more pronounced than the distal marginal ridge. The outline of the crown converges distally.

QUESTIONNAIRE

1. What is deciduous dentition? What are the functions of deciduous dentition?
2. How do you differentiate between deciduous and permanent dentition?
3. Discuss the morphology of deciduous maxillary central incisor with diagram. How do you differentiate between deciduous maxillary and mandibular central incisor?
4. Discuss the morphology of deciduous maxillary canine with diagram. How do you differentiate between the features of deciduous maxillary and mandibular canine?
5. Discuss the morphology of deciduous maxillary first molar with diagram. How do you differentiate between the morphological features of deciduous maxillary first and second molar?
6. Discuss the morphology of deciduous mandibular first molar with diagram. How do you differentiate between the features of deciduous mandibular first and second molar?
7. Write short notes on:
   a. Leeway space of Nance.
   b. Tubercle of Zuckerkandl.
   c. Tubercle of Carabelli.

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Essentials of Dental Anatomy & Oral Histology

Essentials of Dental Anatomy and Oral Histology is a lucid, well-illustrated and simple text for the undergraduate dental students. The text includes detailed morphology of deciduous and permanent sets of dentition, occlusion, basic method of tooth carving, vasculature and innervations of orofacial region, maxillary sinus, basic general embryology, development of tooth, mechanism of shedding and eruption of tooth, detailed histology of enamel, dentin, pulp, cementum, alveolar bone, periodontal ligament, oral mucosa and salivary gland. The text contains considerable number of colored photographs, original photomicrographs, illustrations, tables and diagrams. This edition includes few relevant additions and questionnaires in each chapter.

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