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Pedodontics Department

Deciduous teeth

morphology, eruption, stages of growth and development

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PRIMARY TEETH

The human dentition is termed heterodont = it is comprised of different types, or classes, of teeth to perform different functions in the mastication process.

Man has two separate sets of teeth or ***dentitions*** →→→
diphyodonta

Dentition periods:

- *primary dentition period;*
- *mixed dentition period;*
- *permanent dentition period.*

Roles of the temporary dentition:

- biological (nutrition → food diversification);*
- psycho social (allow learning articulate speech);*
- somatic and mental development of the child;*
- space maintenance for the normal eruption of the permanent teeth;*
- stimulus for modeling and development structures.*

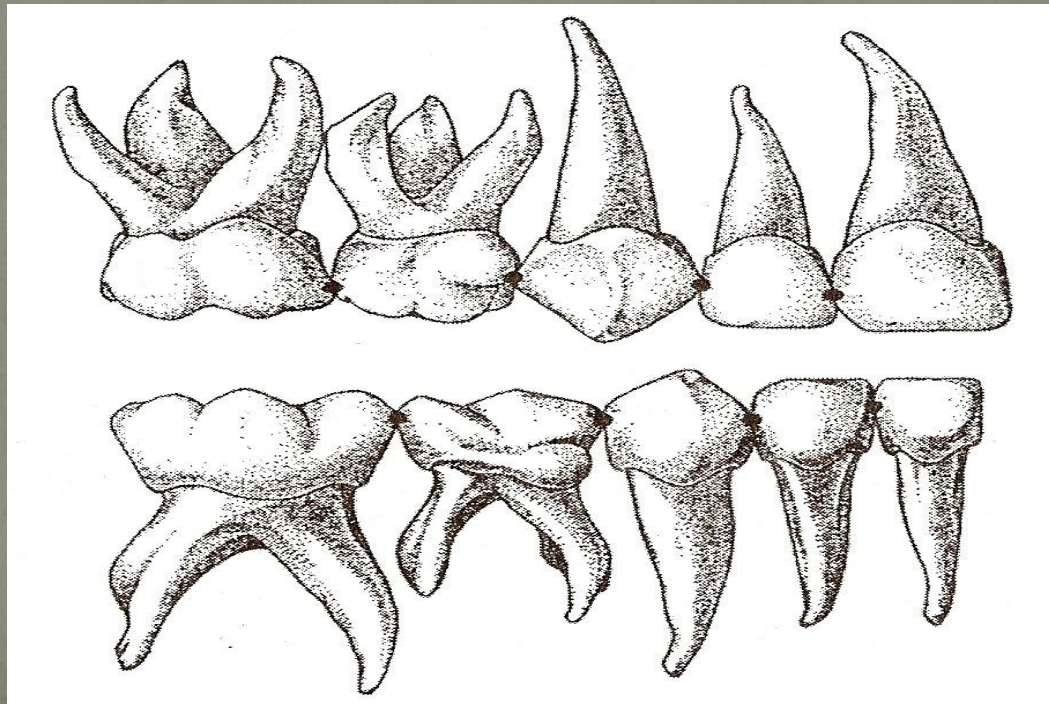
General morphological particularities of the temporary teeth

Dental crown of the primary teeth:

- less than permanent teeth;
- occlusal face narrower than the one of the permanent teeth;

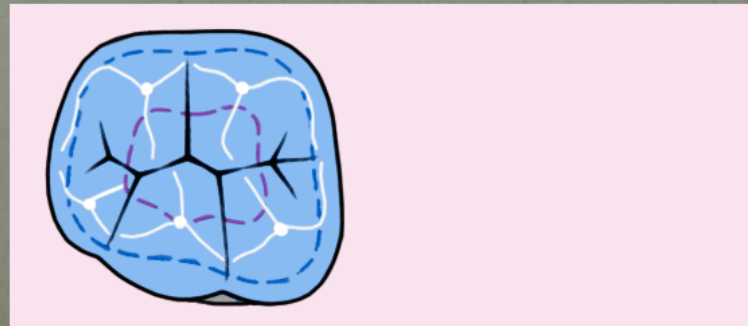
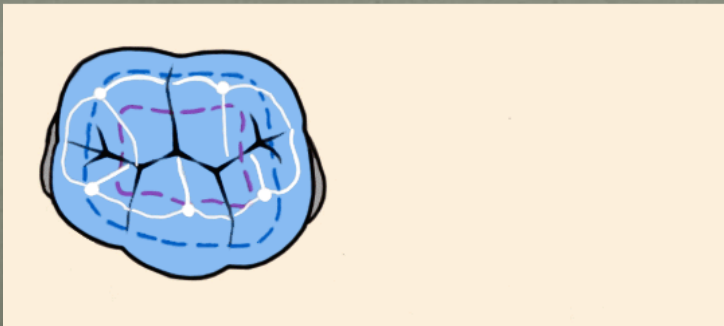
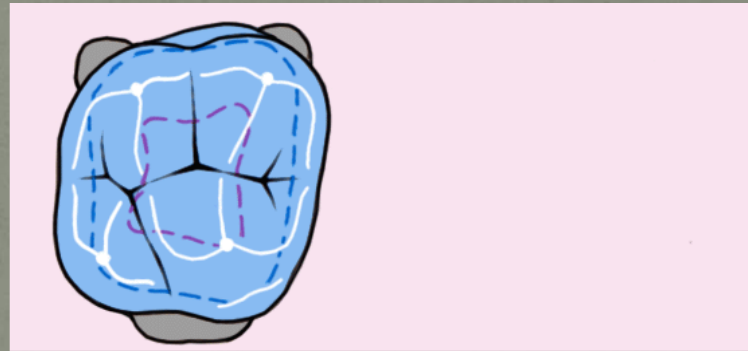
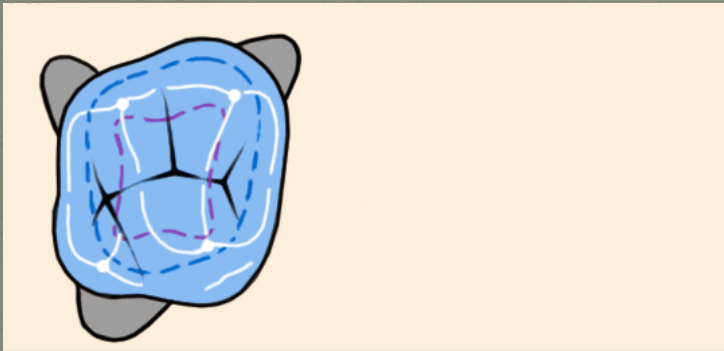
Dental crown of the primary teeth:

- may converged to cervical;
- enamel and dentine are thinner;
- the color is lighter (white-blue).



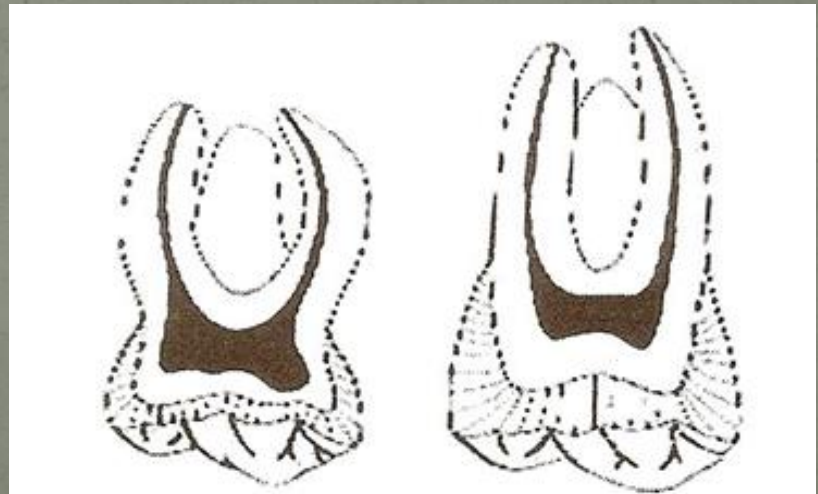
Dental crown of the primary teeth:

- contact areas of temporary molars are flat and stretched.



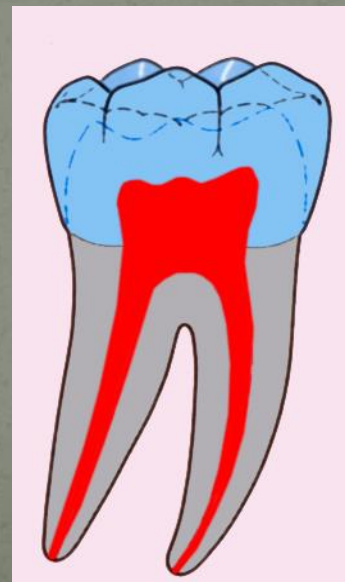
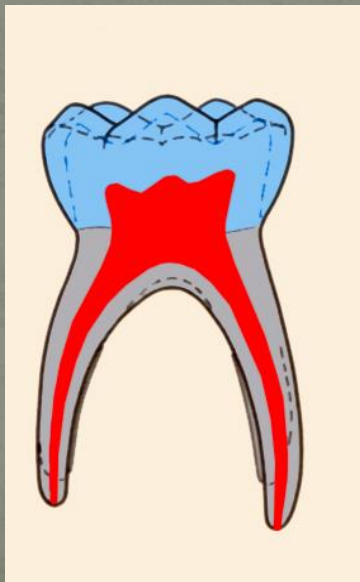
The pulp of the primary teeth:

- is larger than the permanent tooth in relation to the volume of the crown;
- horns pulp are closer to the tooth surface;
- the pulp chamber of the lower molar is greater than the upper molars;
- form the pulp chamber of temporary teeth outlines crown surface;
- from histologically, point of view there is little difference between the pulp of the temporary teeth and the permanent teeth;



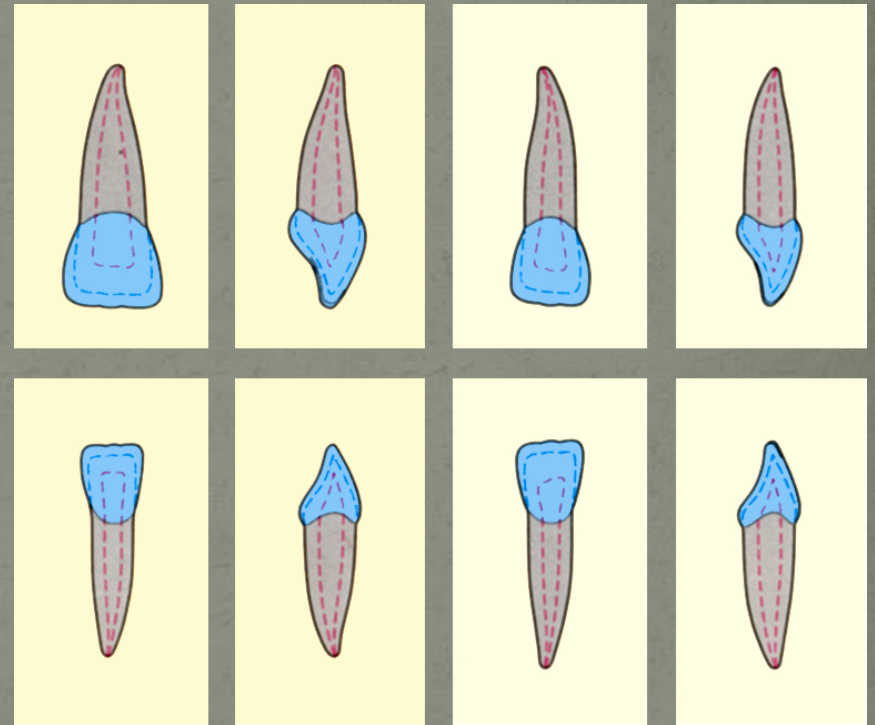
The roots of the primary teeth:

- the root of the frontal teeth is flattened mesio-distally to the frontals of the permanent;
- molars root is longer and thinner;
- molars roots narrows as they approached the apex → sufficient space for developing the permanent buds.



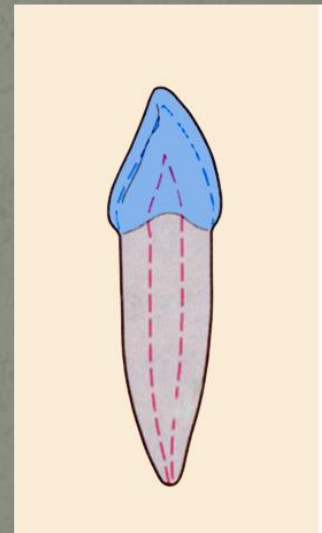
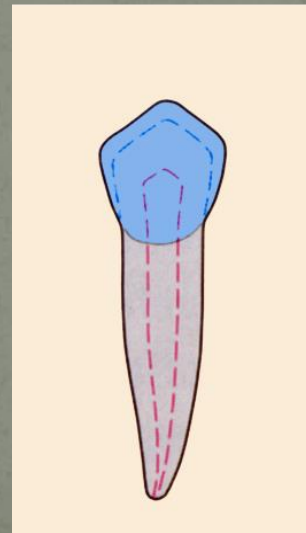
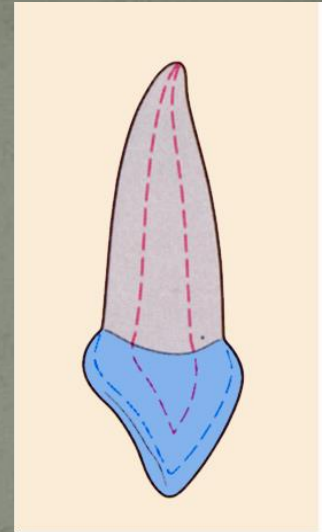
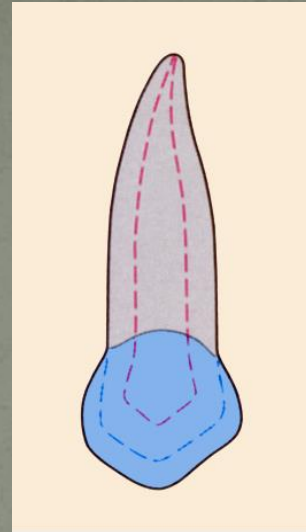
- temporary incisors have a similar shape to that of permanent, but are much smaller dimensions;
- lower central incisor is flattened symmetrically from the vestibular part;
- crown has a length of $\frac{1}{3}$ of root length, and presents the cingulum on the lingual surface;
- root is long and cylindrical;
- lower lateral incisor differs from the central incisor in that distal angle that is more rounded;
- lateral incisor is longer but narrower than the central incisor.

Primary incisors



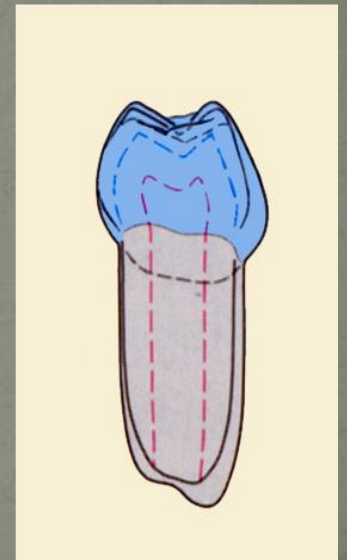
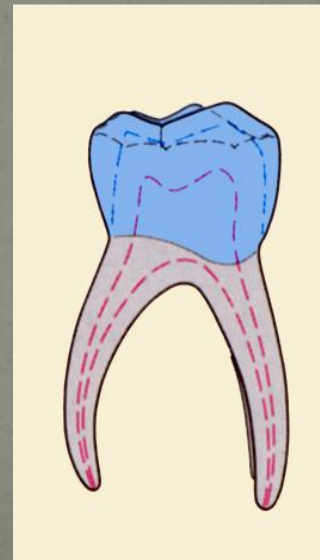
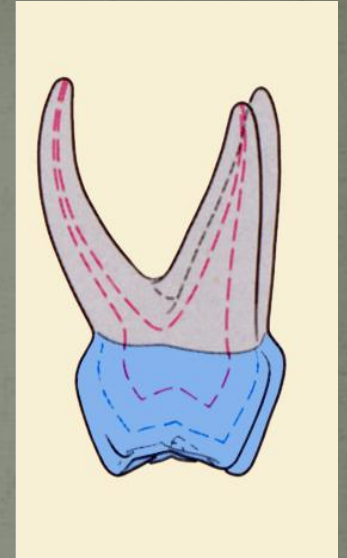
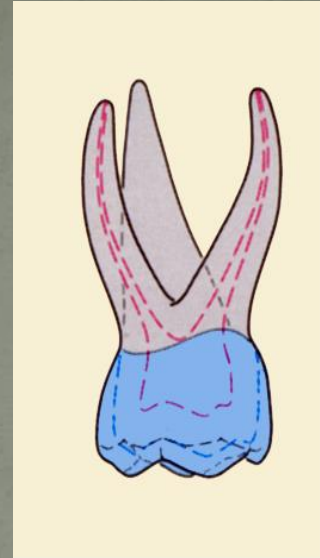
Primary canines

- are long and sharp;
- often present a prominent cingulum;
- root is long and thin, having twice the length of the crown;
- lower canine is a long and narrow tooth, with overall dimensions much smaller than its antagonist;
- contact point is close to the cervical third of the tooth.

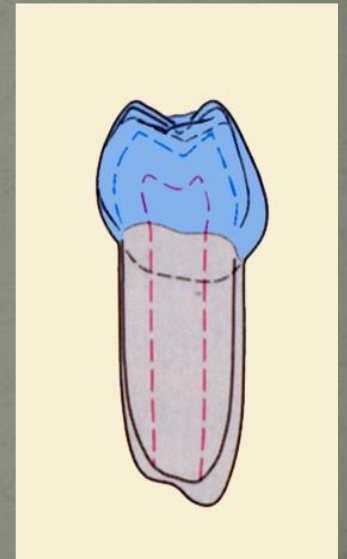
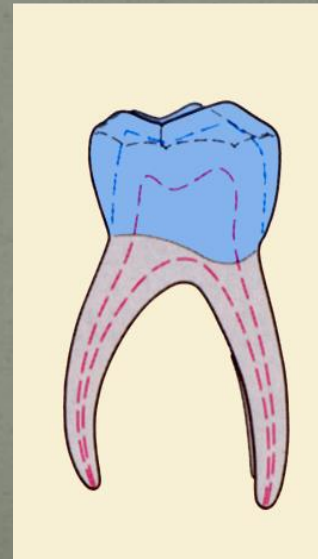
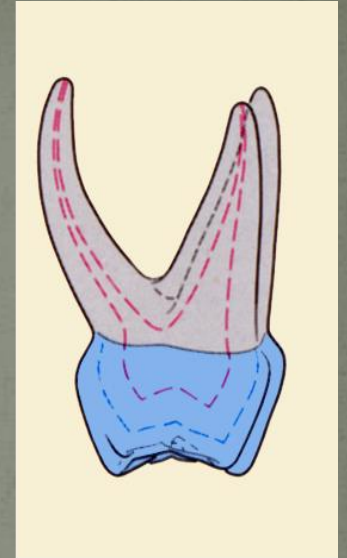
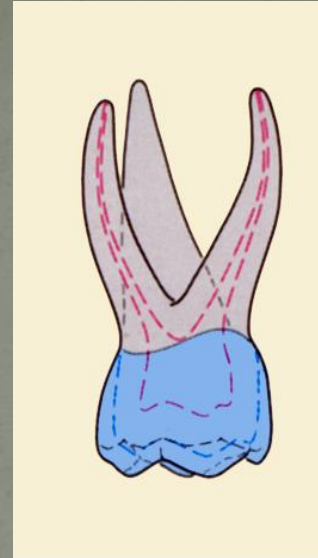


Primary molars

- there is a similar pattern for permanent molars and premolars similar one, which for the last upper molars more frequently;



- first upper primary molar resembles more a premolar than a molar, having thus a unique feature in human dentition;
- upper second molar is a small-scale copy of the first permanent molar, presenting in 75-80% cases the Carabelli's tubercle;
- the upper molars - three roots;
- lower molars - two roots;
- lower second molars is a copy scale of the first lower permanent molar.



Morphoclinical considerations about the morphology of the temporary teeth

Restoration of incipient lesions of the temporary teeth will be made taking into account the following factors:

- enamel is thinner → the caries process has a faster progress in deciduous teeth;
- dentin thickness is proportional with the enamel, allowing microorganisms to progress to the pulp chamber;
- the mesial horns are closer to the occlusal face versus permanent teeth;

Morphoclinical considerations about the morphology of the temporary teeth

Restoration of incipient lesions of the temporary teeth will be made taking into account the following factors:

- reduced thickness of the hard tissues of deciduous teeth allow rapid evolution of the caries and increase susceptibility to aggressive factors pulp;
- immediately after the eruption of the temporary teeth, the pulp chamber is very bulky, following the general contour of the tooth;
- abrasion occurs → → temporary teeth pulp chamber reduces its size.

Deciduous teeth have a limited life time, their evolution followed by resorption phenomena and ultimately replaced with permanent teeth.

Each deciduous tooth go through the following stages:

- **forming** - during intra-uterine life;
- **eruption** - which ranges from 6 months to 3 years;
- **occlusion and stability** - which in temporary dentition is short, followed by resorption.
- **resorption** - which begins:
 - 4-5 years - incisors;
 - after 6 years - the canines and lowers molars;
 - after 8 years - the canines and upper molars.

Growth phases covered by a temporary tooth are:

- ***phase of growth and development*** (until the crown and root fully edified) - ***stage I*** = 1 year

- ***maturation and stability phase*** (between complete building of the root and the beginning of the resorption) - ***stage II*** = +/- 3 years 6 months

- ***phase resorption*** (resorption covers the period up to tooth loss) - ***stage III*** = 4 years.



the "functioning" of a temporary tooth = 8 years

Temporary tooth root resorption (shedding) = biological phenomenon which is a gradual reduction of the root until the complete or substantially complete exfoliation of the temporary tooth followed by the eruption of the permanent teeth.



Temporary tooth root resorption (physiological shedding)

- start at about 1-2 years after completion of root growth;
- is a rhythmic process = periods of activity followed by breaks → tooth goes through successive periods of mobility and reattachment.

Eruption is the developmental process responsible for moving a tooth from its crypt position through the alveolar process into the oral cavity to its final position of occlusion with its antagonist. It is a dynamic process that encompasses completion of root development, establishment of the periodontium, and maintenance of a functional occlusion.

Emergence, on the other hand, should be reserved for describing the moment of appearance of any part of the cusp or crown through the gingiva. Emergence is synonymous with *moment of eruption*, which is often used as a clinical marker for eruption.

The physiological process of tooth eruption:

- It is closely linked to the overall development of the body;
- It is influenced by genetic, neuro-endocrine, metabolic and loco-regional factors.



- variations in the age of eruption;
- influence the order of eruption;
- variations in eruptive route.

- The speed with which dental groups appear
 - closely linked to the somatic development:
 - accelerated somatic development → acceleration of the eruption (early eruption);
 - delayed somatic development → delay of the eruption (late eruption).

The mechanism of dental eruption

Factors influencing the tooth eruption are:

- general;
- local.

The mechanism of dental eruption

Among the general factors, the most important are:

- heredity;
- racial and regional type;
- living conditions;
- endocrine glands;
- CNS;
- diet;
- environmental factors;
- sex;
- biological factors related to the mother;
- birth weight;
- chromosomal abnormalities;
- eruptive fevers and congenital heart anomalies.

Local factors

Local factors:

- temporary teeth pulpopathies;
- temporary teeth trauma;
- premature temporary teeth loss.

Eruption of primary teeth

- dental eruption phenomenon is one of the criteria for assessing the growth and development of the child;
- teething process is fully integrated into the overall development of the child;
- endo and exogenous factors that influence growth and development processes find expression in changes of onset, rate and duration of eruption of primary teeth.

Sequence and chronology of tooth eruption

Chronology of the Human Primary Dentition

Jaw	Tooth	Calcification begins (mo <i>in utero</i>)	Crown completed post-natally (month)	Time of emergence (month)	Root completed (yrs) (year)	Emergence sequence
Max. (upper)	i ¹	3-4 months	2	7-10	2.5	2
	i ²	4 months	2-3	8-11	2.5	3
	c ¹	4-5 months	9	16-19	3.5	7
	m ¹	4 months	6	12-15	3	5
	m ²	5 months	11	25-28	4	10
Mand. (lower)	i ₁	3-4 months	2-3	6-8	2.5	1
	i ₂	4 months	3	9-13	2.5	4
	c ₁	4-5 months	9	17-20	3.5	8
	m ₁	4 months	6	12-16	3	6
	m ₂	5 months	10	20-26	3.5	9



The six/four rule for primary tooth emergence

Four teeth emerge for each 6 months of age

1. 6 months: 4 teeth (lower centrals & upper centrals)
2. 12 months: 8 teeth (1. + upper laterals & lower laterals)
3. 18 months: 12 teeth (2. + upper 1st molars & lower 1st molars)
4. 24 months: 16 teeth (3. + upper canines & lower canines)
5. 30 months: 20 teeth (4. + lower 2nd molars & upper 2nd molars)

1. By 5 months in utero, all crowns started calcification
2. By 1 year old, all crowns completed formation
3. By 2.5 years, all primary teeth erupted
4. By 4 years old, all primary teeth completed root formation

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EVOLUTION

