

# TOOTH DEVELOPMENT

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Dentalelle Tutoring

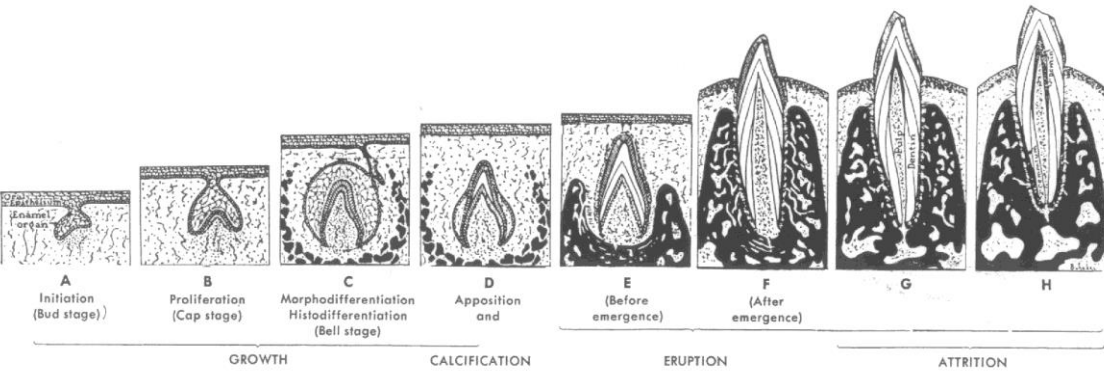
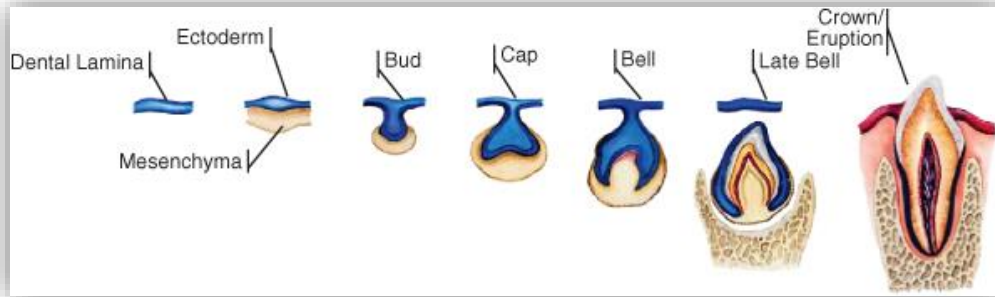
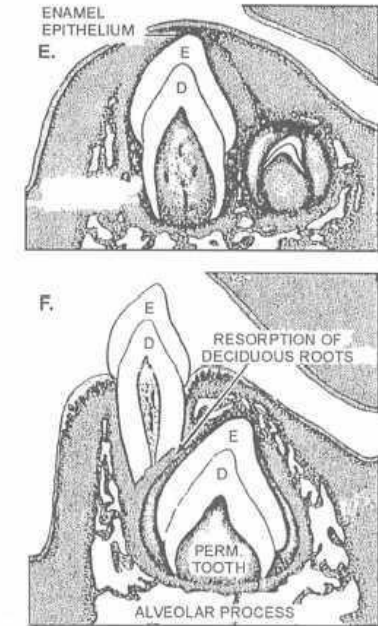
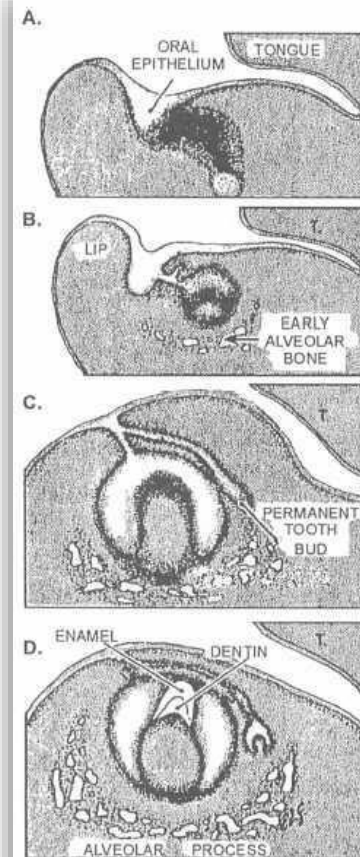


Fig. 2-1. Diagrammatic illustration of the life cycle of the tooth. (Modified from Schour, I., and Massler, M.: J. Amer. Dent. Ass. 27:1785, 1940.)



- A. BUD STAGE.
- B. CAP STAGE.
- C. BELL STAGE.
- D. CALCIFICATION OF ENAMEL MATRIX.
- E. FORMATION OF THE ROOT.
- F. RESORPTION OF ROOTS AT DECIDUOUS TOOTH.

DTBF0401

# WHAT ARE THE 6 MORPHOLOGICAL STAGES OF TOOTH DEVELOPMENT?

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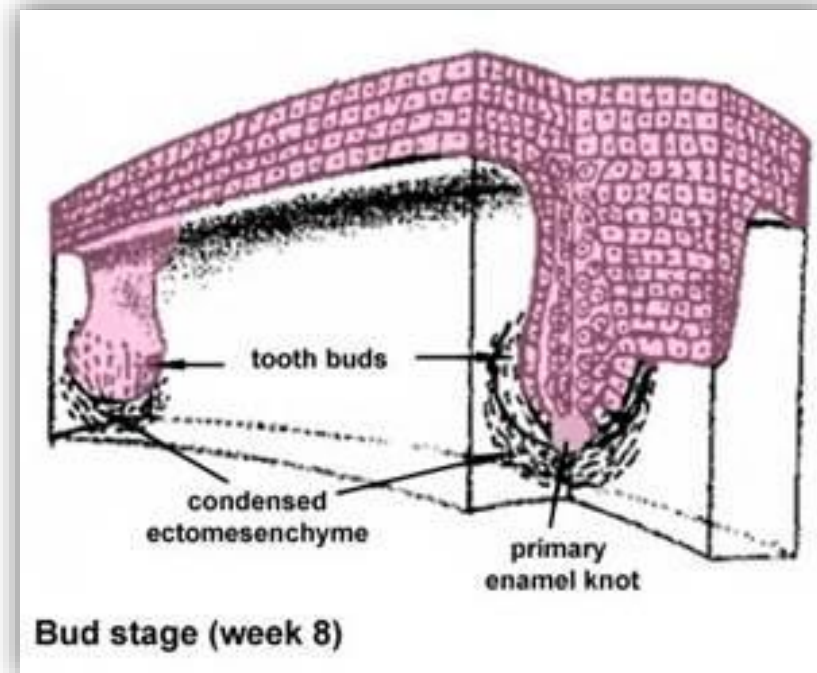
# Answer

- 1-Bud
- 2-Cap
- 3-Bell
- 4-Apposition
- 5-Root Formation
- 6-Eruption



# Answer

- Bud Stage



# WHAT SIGNIFIES THE APPEARANCE OF THE CAP STAGE?

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# Answer

- 3-layered enamel organ (epithelially derived)
- Layers: OEE
- IEE
- SR
- The enamel organ (enamel) "cap" over the ball of ectomesenchyme.

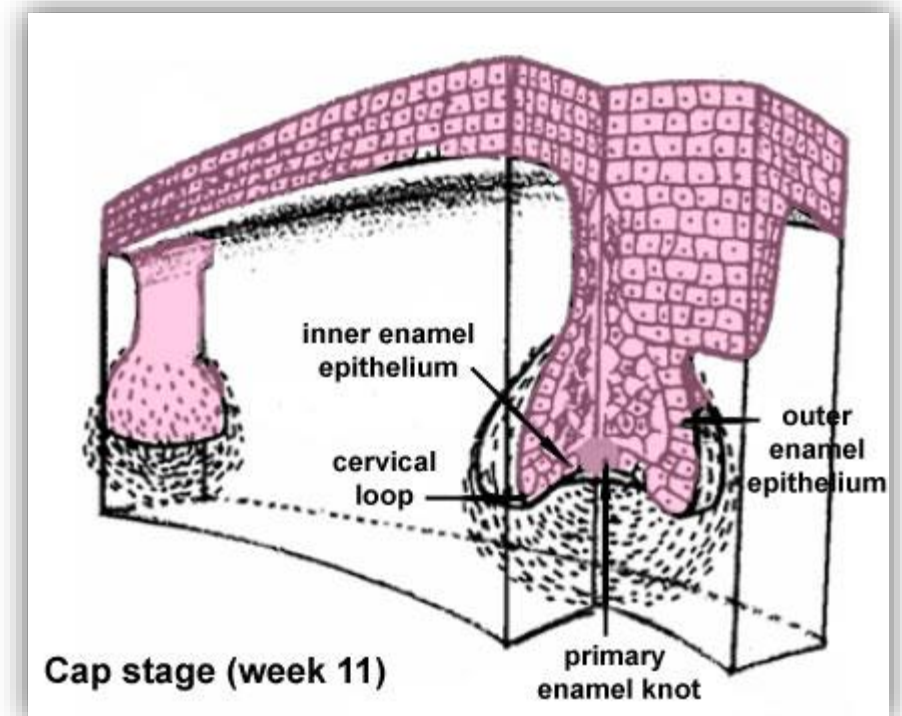


# WHAT ARE THE STEPS OF EARLY CAP STAGE? (3)

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# Answer

- 1-Epithelial bud proliferate into the ectomesenchyme and cellular density increases immediately adjacent to the outgrowth, this is known as CONDENSATION OF THE ECTOMESENCYME.
- 2-As tooth bud grows, drags part of the dental lamina, THE DEVELOPING TOOTH IS TETHERED TO THE DENTAL LAMINA BY THE EXTENSION CALLED THE LATERAL LAMINA (more common to call dental lamina).
- 3-Epithelial outgrowth (ENAMEL ORGAN) forms a "cap" over condensed ectomesenchyme.



**WHAT ARE THE 2 ABNORMALITIES  
OF DENTITION THAT CAN BE  
CAUSED BY DISRUPTIONS DURING  
THE BUD STAGE?**

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# Answer

- **Microdontia:** abnormally small teeth (affects max lateral incisors and third molars most commonly).
- **Macrodontia:** abnormally large teeth (macrodontia of single teeth is relatively uncommon and often associated w/ Hemifacial Hypertrophy).

# WHAT SIGNIFIES THE APPEARANCE OF THE CAP STAGE?

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# Answer

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# WHAT ARE THE 5 ENAMEL ORGAN COMPONENTS?

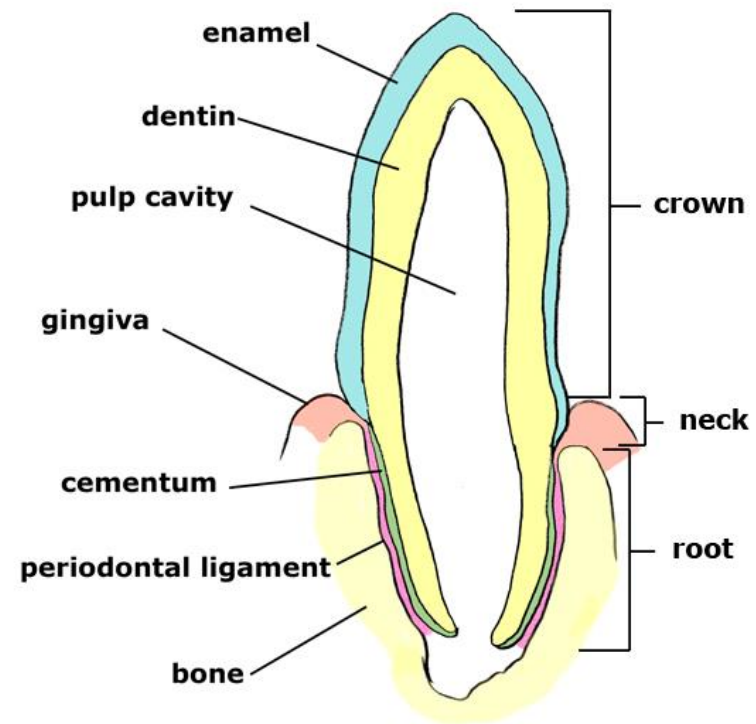
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# Answer

- (from exterior to interior)
- Outer Enamel Epithelium (OEE): convex layer, squamous to low cuboidal cells
- Stellate Reticulum (SR): Cells in the core produce proteoglycans to maintain morphology of enamel organ
- Stellate Intermedium (SI): Elaborate enamel, cells initiate the formation of dentin from dental papilla cells
- Inner Enamel Epithelium (IEE): concave layer, cuboidal to low columnar cells
- Cervical Loop (IEE + OEE): represents the presumptive cervix of the future tooth



# Good to visualize



# OEE DURING BELL STAGE:

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# Answer

- Low cuboidal, forms the outer periphery of enamel organ
- At end of bell stage, cells become fluted and the invaginated areas become occupied by blood vessels from the dental papilla.
- separated from the dental follicle by a basal membrane
- cell cytoplasm contains few organelles and large nucleus

# WHAT STAGE IS THIS?

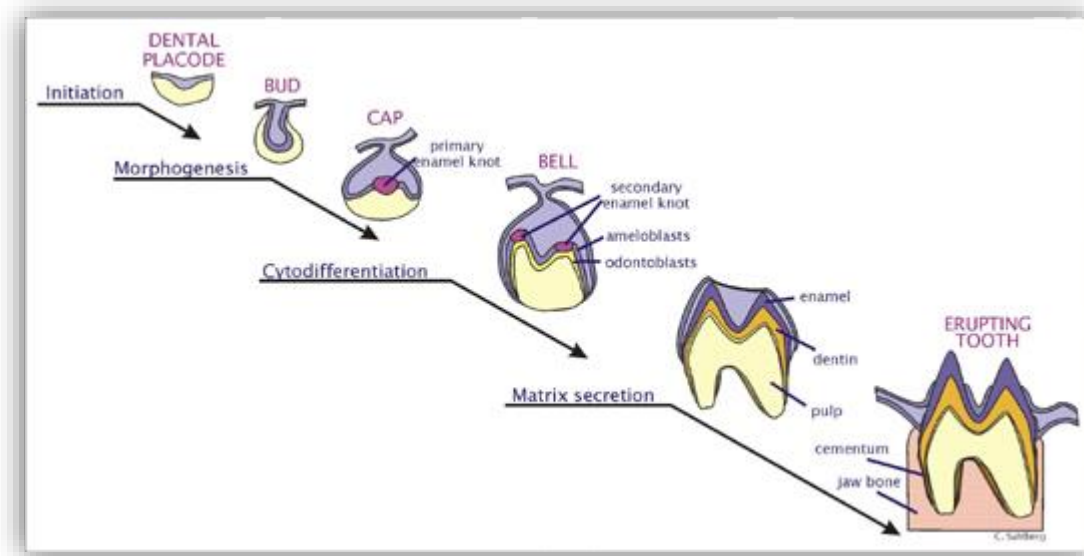
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Thickened DENTAL LAMINA invades into the underlying ectomesenchyme.

TOOTH GERM is a round mass or column of DENTAL LAMINA (oral epithelium) surrounded by (condensed mesenchymal cells).

# Answer

- Bud Stage



# WHAT STAGE IS THIS?

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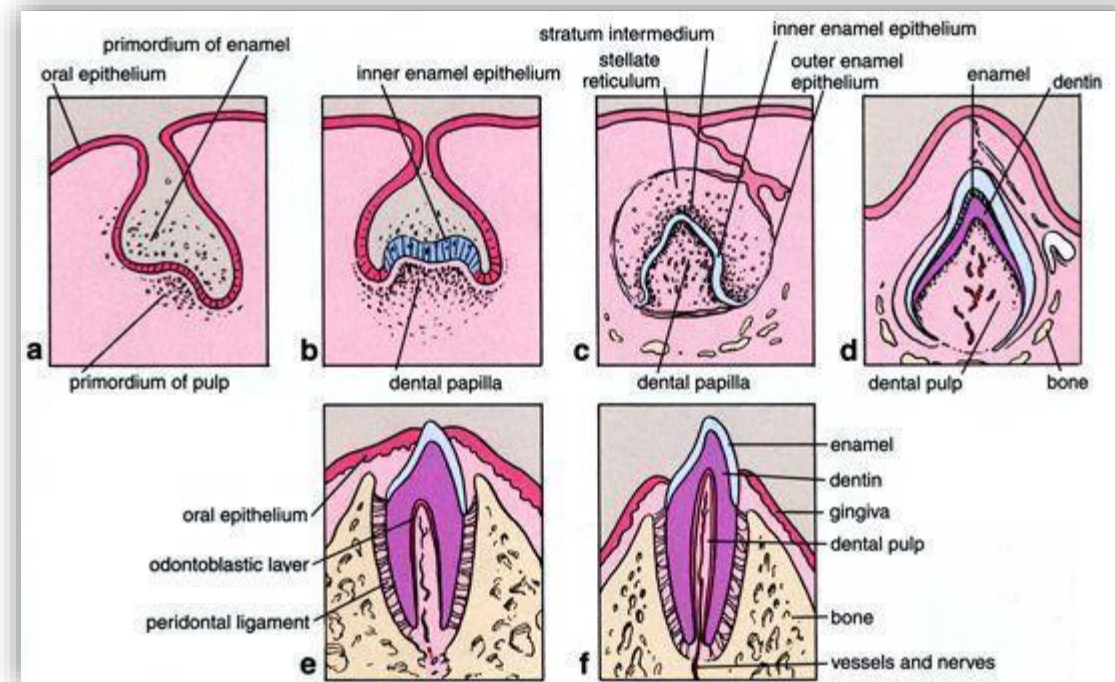
Cells of the DENTAL LAMINA proliferate and differentiate into the ENAMEL ORGAN, which is formed over the ectomesenchyme.

The ectomesenchyme beneath the enamel organ is called the DENTAL PAPILLA.

Ectomesenchyme surrounding the enamel organ is called the DENTAL SAC/DENTAL FOLLICLE.

# Answer

- Cap Stage



# Remember to read...

- Your oral embryology and histology chapter in your textbook everyone 😊. This will help make things a little easier to understand.

