MAXILLARY AND MANDIBULAR INCISORS

MONICA SALUD M. YÑIGUEZ, DDM

LET'S BEGIN!

Use your arrows to move from one slide to another

WHICH WOULD YOU PREFER?

A

B

HOW WILL YOU MANAGE?

*As a dentist, you will have to **analyze the discrepancies** and be able to **create a more acceptable** (aesthetics & function) **restoration** for the patient. This can be done **directly** or by doing a **diagnostic wax-up** to communicate with the lab.*

LEARNING OBJECTIVES

At the end of this presentation, you should be able to:

1. Know the different functions of incisors.
2. Recognize the maxillary and mandibular incisors upon seeing them.
3. Describe the different characteristics of the maxillary and mandibular incisors.
4. Differentiate them from one another.

HOW WILL WE ANALYZE TEETH?

We'll start with the incisors because they have a relatively simple shape, limited features and landmarks. Thus, they are easier to learn and is a good starting point.

We'll tackle them starting with the general characteristics of all incisors, or class traits. Then we move on to the arch traits and lastly, the type traits or characteristics specific to each tooth.

You'll learn which characteristics we look for **per surface**.

Once you learn it, the process of analyzing teeth will be the **same** for the rest of the human dentition.

That being said, we'll review first the landmarks and terminologies you learned in your previous modules.

Are you ready?

REVIEW OF LANDMARKS AND TERMINOLOGIES

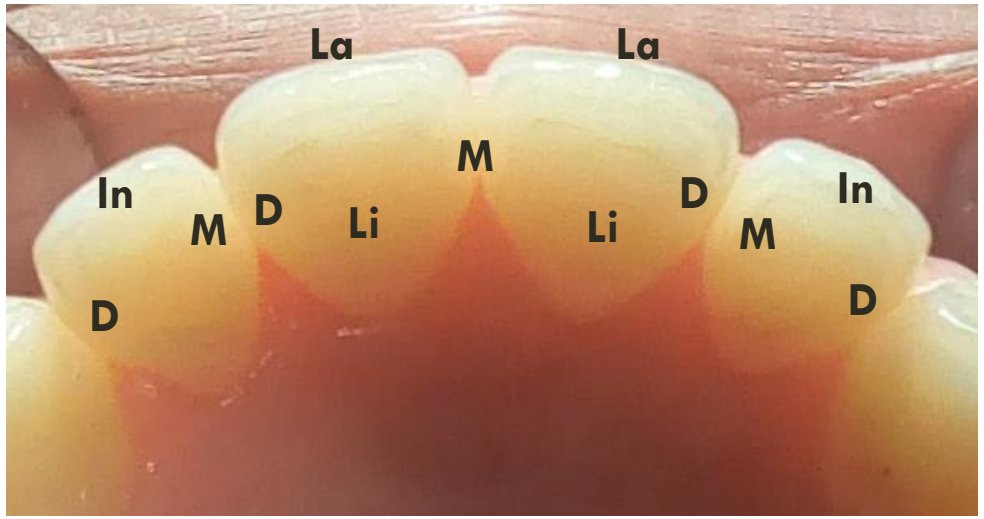
In case you forgot…

Remember that you're on your way to becoming dentists. You need to learn to communicate as dentists do.

SURFACES

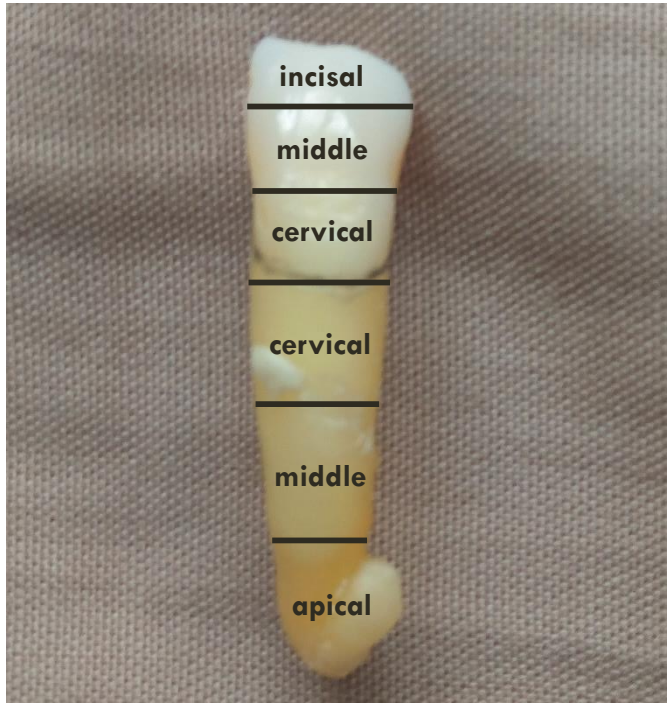
In this module, I will be describing the characteristics of each tooth from each surface. Let us review the five tooth surfaces that you previously learned.

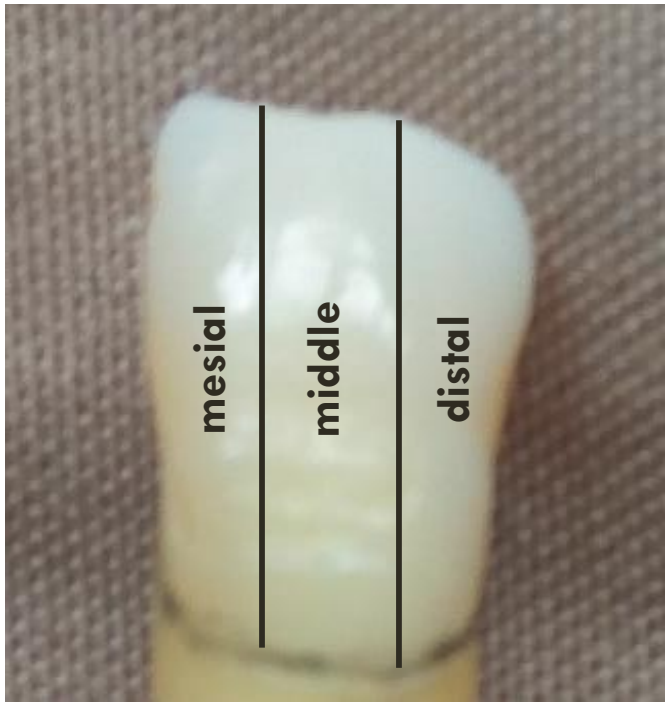
1. **LABIAL or FACIAL** (lip side)
2. **LINGUAL or PALATAL** (tongue or palate) side
3. **MESIAL** (towards midline)
4. **DISTAL** (away from midline)
5. **INCISAL** (biting surface)

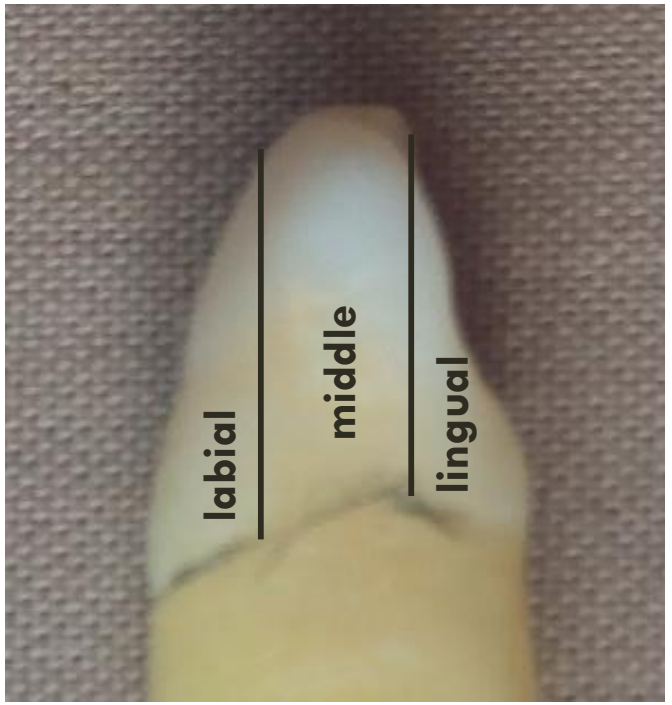


DIVISIONS OF THE TEETH

I will also be describing features based on their locations on each surface of the tooth. For ease of description, remember the **thirds**.







GENERAL DESCRIPTION OF INCISORS

FUNCTIONS OF INCISORS

In general, incisors function together to **cut or shear food**. They also **enable articulate speech**.

PONDER THIS…
Have you ever heard people with missing front teeth speak? Notice the lisp?

FUNCTIONS OF INCISORS

Incisors also **support the lip and maintain a good appearance**. In today's beauty standards, missing front teeth have become a measure of desirable appearance.

LOOK!
Notice how the upper lips are asymmetrical? That is because of the missing maxillary right central and lateral!

FUNCTIONS OF INCISORS

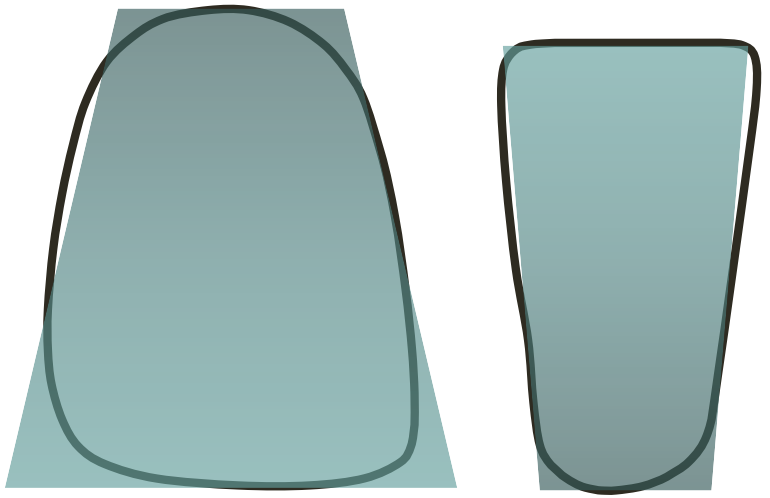
They also help **guide the mandible posteriorly during closing of the jaw** when the maxillary and mandibular incisors meet.

TRY THIS!

Do this in front of a mirror if you want. Let the incisal surfaces of your maxillary and mandibular incisors touch each other. Then slowly let your mandibular incisors slide backwards against the lingual surface of the maxillary incisors until you feel your posterior teeth contact each other. Notice the path?

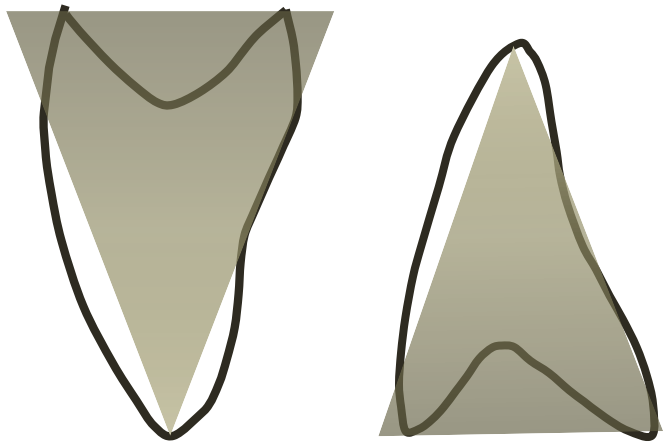
GENERAL FORM

From the labial or lingual aspects, the general shape is **trapezoid (or rectangle)** where the longest uneven side is towards the incisal.



This shape provides **adequate space for the periodontal support** (gingiva and bone) of the teeth.

GENERAL FORM

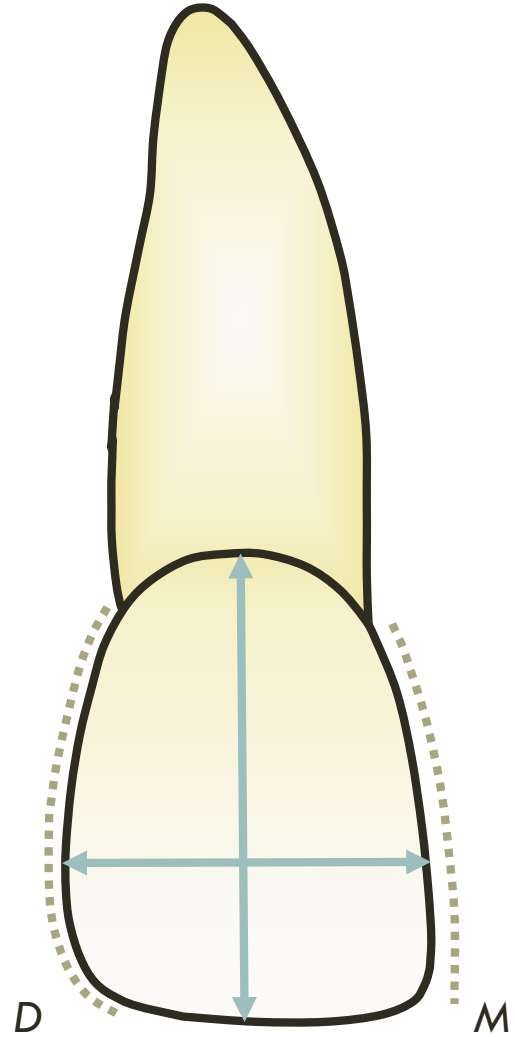


From the mesial or distal aspects, the general shape is **triangle** where the base is towards the cervical.

The wide base at the cervical provides **strength** to the tooth. While its **tapering shape** towards the incisal allows it to effectively **penetrate and cut food**.

GENERAL CHARACTERISTICS

- Incisors are **longer incisogingivally** than wide mesiodistally.
- They are **more convex on distal** than mesial. (dotted line)
- Mesioincisal line angle **more acute** than distoincisal line angle which is **more obtuse**. (sharp vs rounded)
- **Tapering root** but when bent usually at the apical third towards the distal

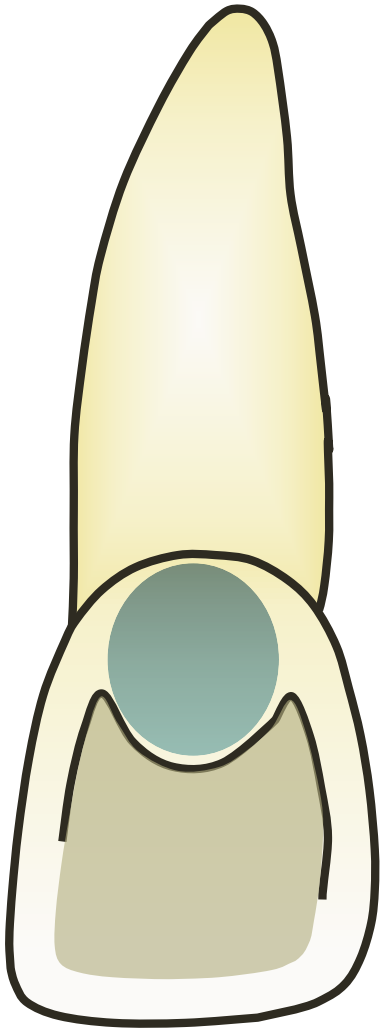


Labial view of 11

GENERAL CHARACTERISTICS

- Cervical lines, which are called CEJ (cemento-enamel junction), are **convex** toward the apex (on both labial and lingual aspects)
- Mesial and distal marginal ridges converge toward the ***cingulum***
- Have a shallow concavity incisal to the cingulum called ***lingual fossa***

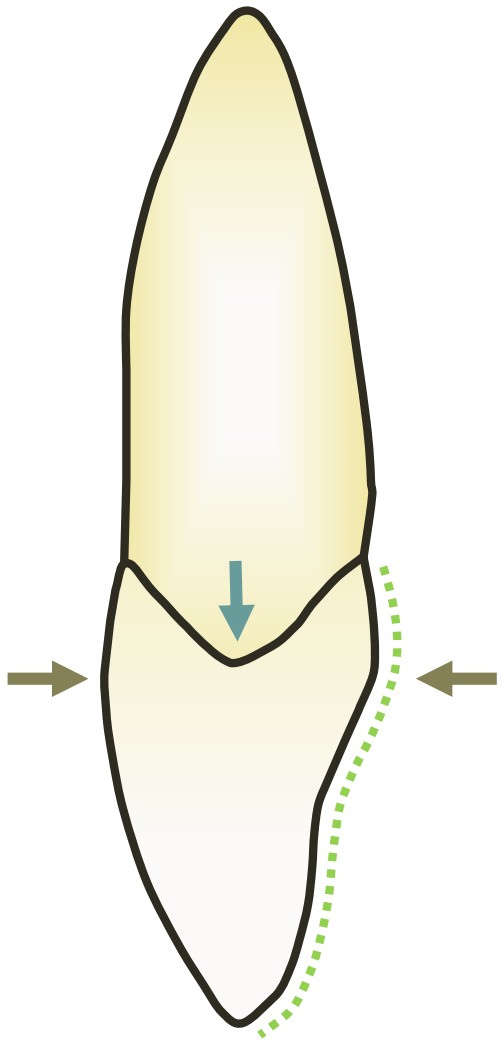
DID YOU KNOW?
The cingulum came from the lingual lobe of an anterior tooth, or the 4th lobe. It makes up the bulk of the cervical third of the lingual surface.



Lingual view of 11

GENERAL CHARACTERISTICS

- Facial and lingual **crests of curvature** are in the **cervical third**
- Proximal cervical lines are **convex toward incisal** and more so on the mesial than distal surface *(basically, mesial is longer than distal)*
- Lingual outlines are **"S" shaped**

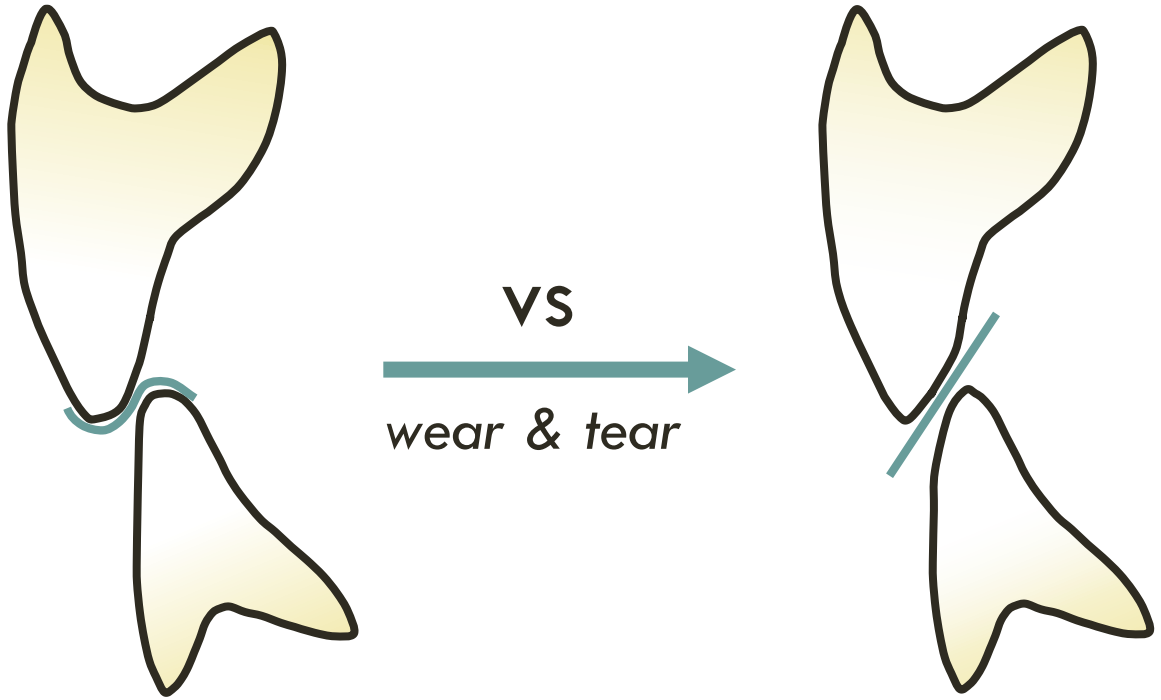


GENERAL CHARACTERISTICS

- Have **incisal ridges or edges**

INCISAL RIDGE

Rounded incisal portion that merges with the mesioincisal and distoincisal angles and labial and lingual surfaces

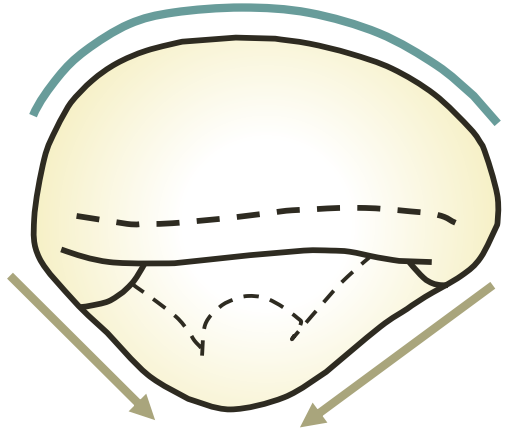


INCISAL EDGE

The merging of the labial and incisal surfaces after the incisal ridge has worn

GENERAL CHARACTERISTICS

- Facial outlines are **broader** than lingual outlines
- Crowns **taper** from proximal contact areas towards the lingual

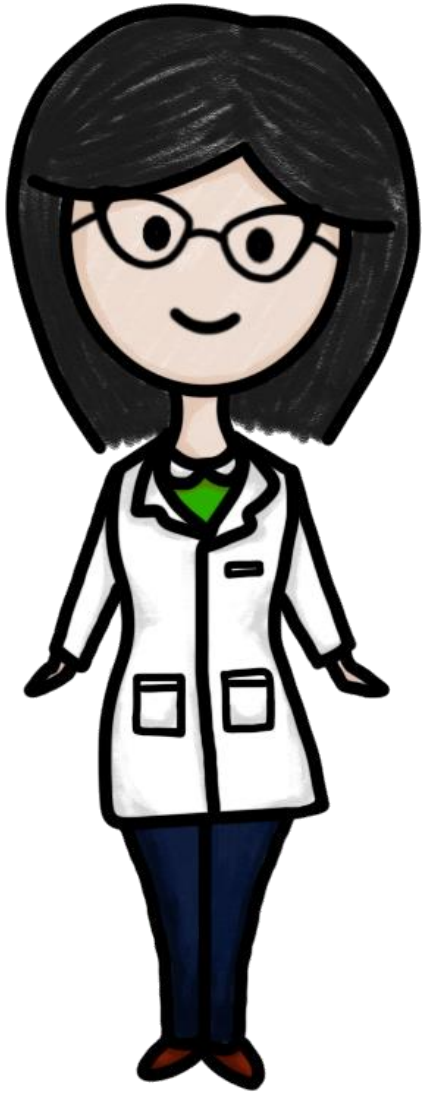


HOW ARE YOU?

Are you still with me?

Take a five-minute breather if it's getting a little too much. Still a long way to go…

From this point on, have your tooth model beside you while you read through the detailed descriptions of each incisor.



MAXILLARY INCISORS

Let's do this!

GENERAL DESCRIPTION

- 4 maxillary incisors: 2 centrals, 2 laterals (FDI, Universal)
- Centrals are the **only neighboring teeth** in the dental arches with **mesial surfaces in contact**
- Maxillary centrals are **larger** than laterals
- Erupt:
  - Centrals 7-8 y/o
  - Laterals 8-9 y/o

PONDER THIS…
In Ortho, we say that it's not the age of eruption that's important, but rather, the sequence of eruption. Why?

MAXILLARY CENTRAL INCISORS

Take out your maxillary central model and try to compare the text with the features of your model.

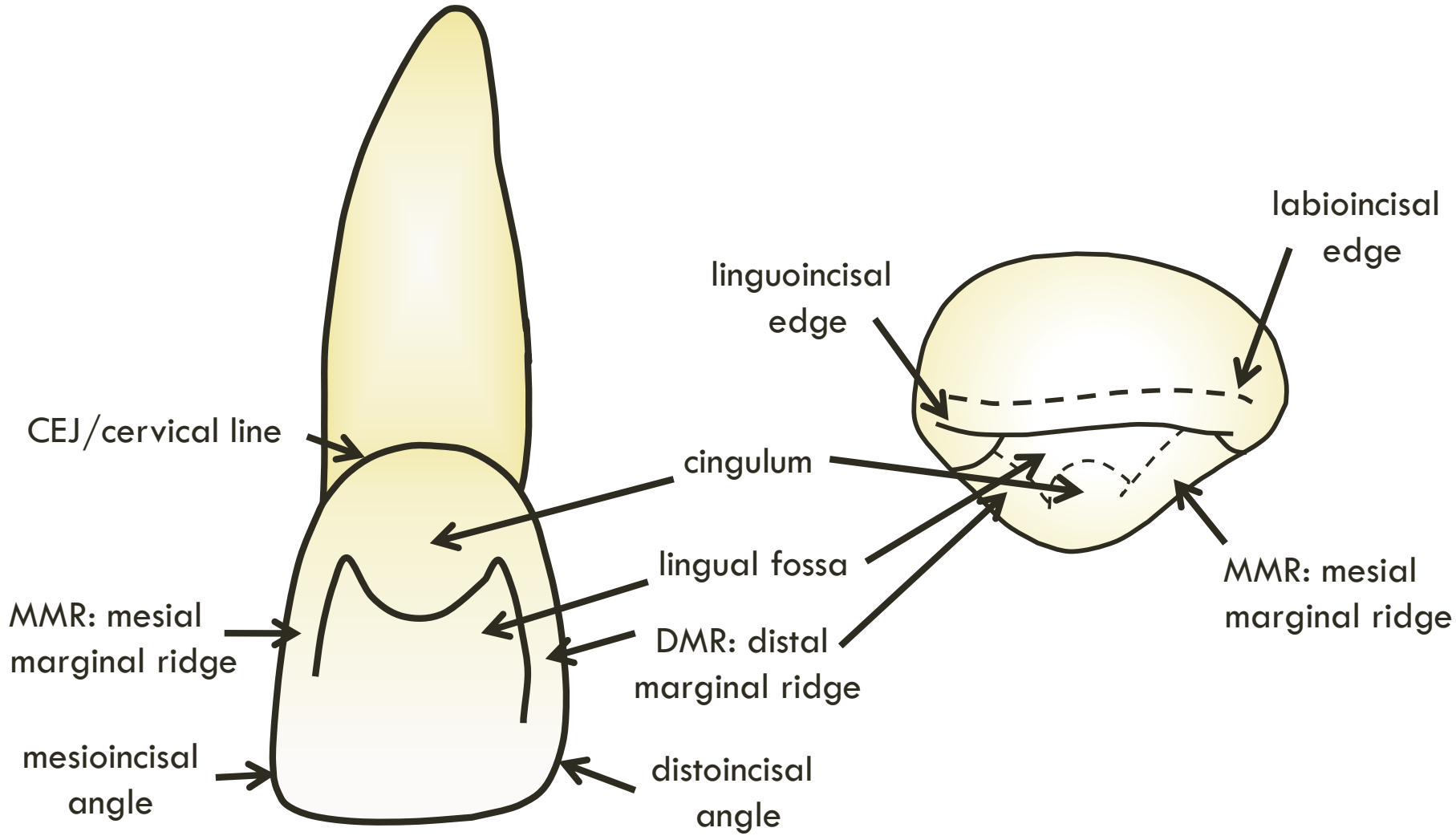
GENERAL FEATURES

- Anterior tooth with the **widest** mesiodistal diameter
- **Shovel-shaped** lingual surface
- Straight, conical root with a blunt apex
- **MAMELONS** – scalloped projections on the incisal ridge of a newly-erupted tooth. They are the incisal portions of the labial lobes of incisors

DID YOU KNOW?

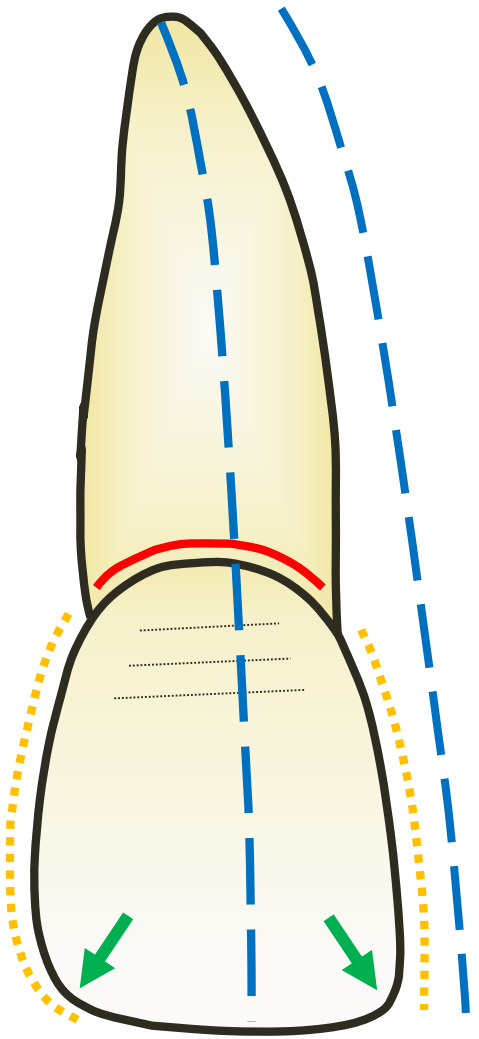
Mamelons are eventually worn away when teeth come into occlusion. That is why the incisal outline is straight.

LANDMARKS


labioincisal edge
linguoincisal edge
CEJ/cervical line
cingulum
lingual fossa
DMR: distal marginal ridge
MMR: mesial marginal ridge
MMR: mesial marginal ridge
mesioincisal angle
distoincisal angle

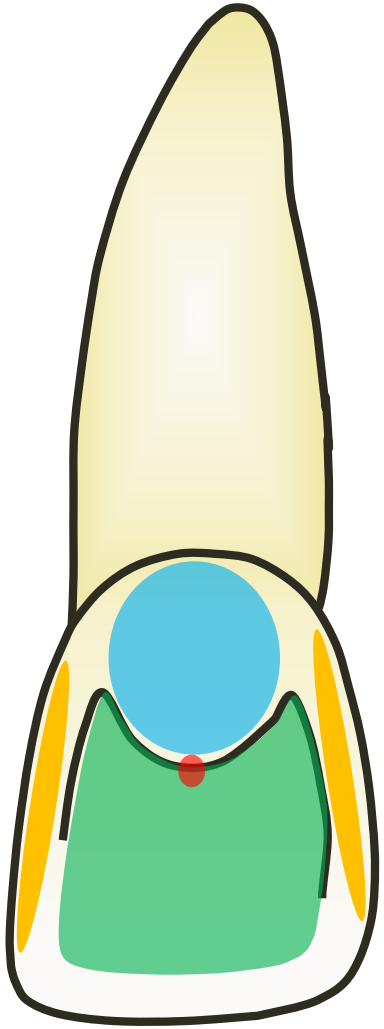
LABIAL

- **Squared** or **rectangular** appearance
- Distal outline is more convex than mesial outline *(orange)*
- Rounded distoincisal angle vs sharp mesioincisal angle *(green)*
- CEJ curves mesiodistally with the curve towards the cervical *(red)*
- **Imbrication lines**: horizontal ridges in the cervical third
- Cone-shaped root with **blunt apex**
- Root is usually 2-3mm longer than crown
- A line drawn through the center of root and crown tends to **parallel** the mesial outline



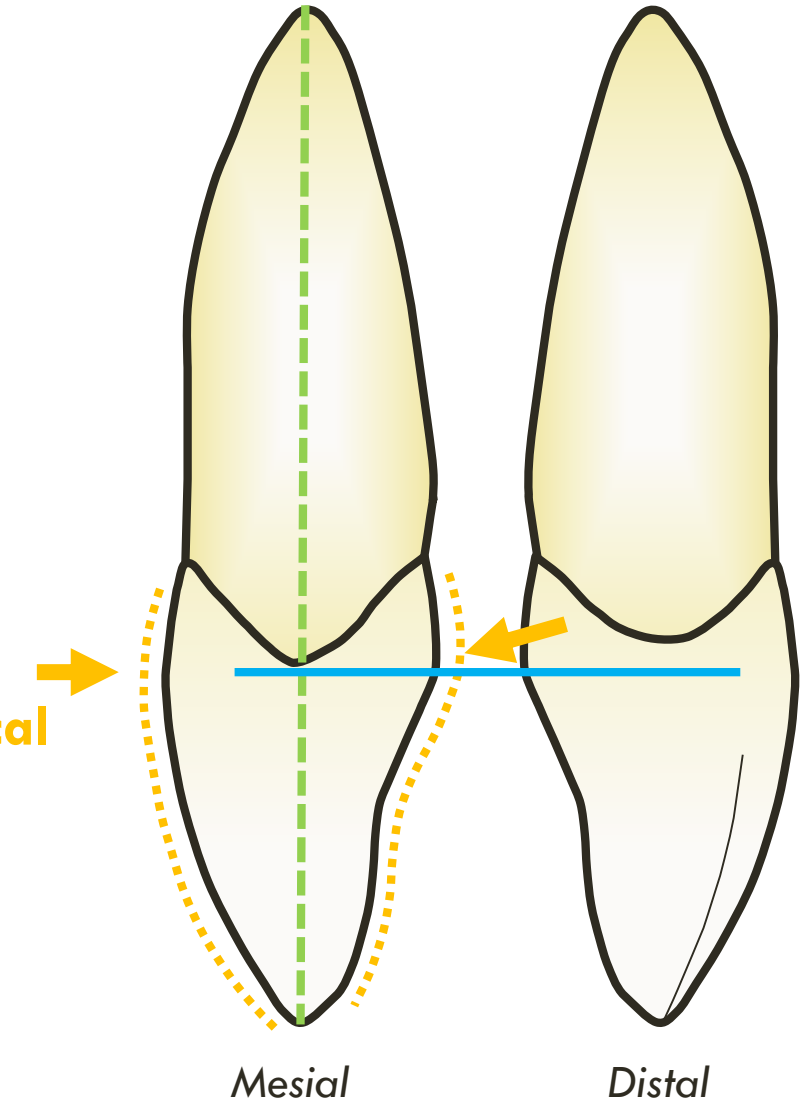
LINGUAL

- Lingual outline is reverse of the labial outline (mirror-image)
- **CINGULUM** – smooth convexity below the cervical line located slightly off-center towards the distal
- **LINGUAL PIT** – at the incisal border of the cingulum
- Prominent **MESIAL** and **DISTAL MARGINAL RIDGES** converge at the cingulum
- **LINGUAL FOSSA** – shallow concavity bordered by marginal ridges, cingulum and incisal edge/ridge



PROXIMAL

- **Wedge-shaped** or **triangular** crown
- Incisal ridge of crown is **in line** with center of the root
- **CEJ curves incisally**, more so the MESIAL than distal
- More of the labial surface is seen on the distal because it slopes distolingually
- Outline: crest of curvature or **height of contour is in cervical third**
  - Labial: slightly convex
  - Lingual: S-curve



PROXIMAL

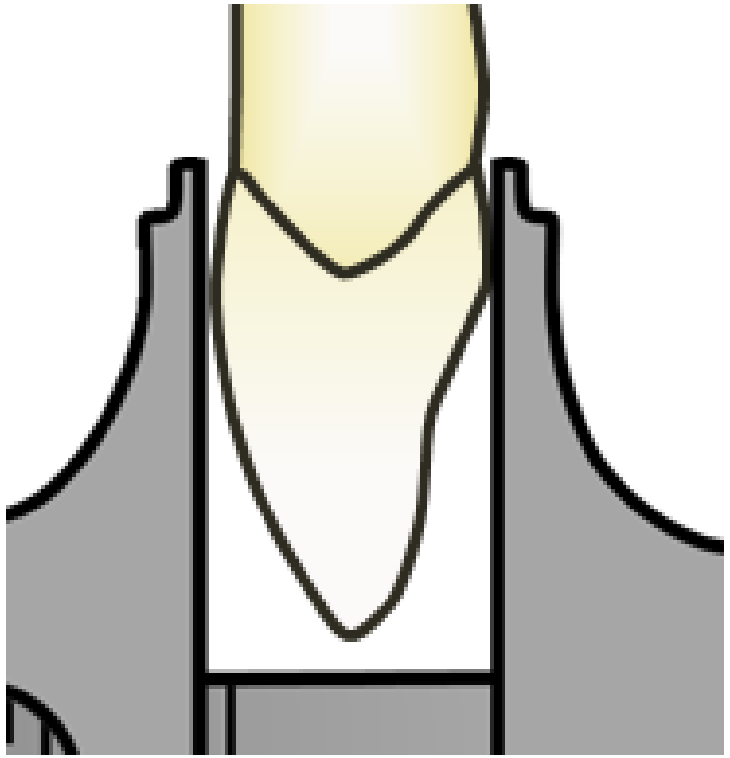
Understanding the height of contour…

From the labial aspect,

height of contour (of proximal surfaces) = contact area

From the proximal view,

height of contour of the labial and lingual surfaces **aids in the proper protection and stimulation of the gingiva**

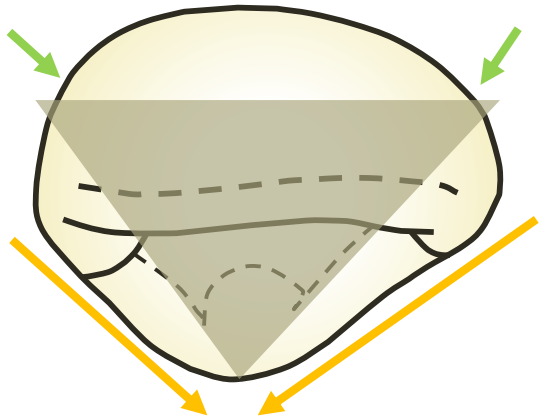


HANDS ON…

You can use your Boley Gauge to find the heights of contours for the labial and proximal views. The Boley Gauge only touches the crest of curvature or height of contour.

INCISAL

- Crown is roughly **triangular: broad and flat labial** converging lingually at the cingulum (tapers to the lingual)
- Mesiolabial and distolabial line angles are **prominent**
- A line drawn from the mesioincisal angle to the center of the cingulum is longer than from the same point to the distoincisal angle *(orange)*



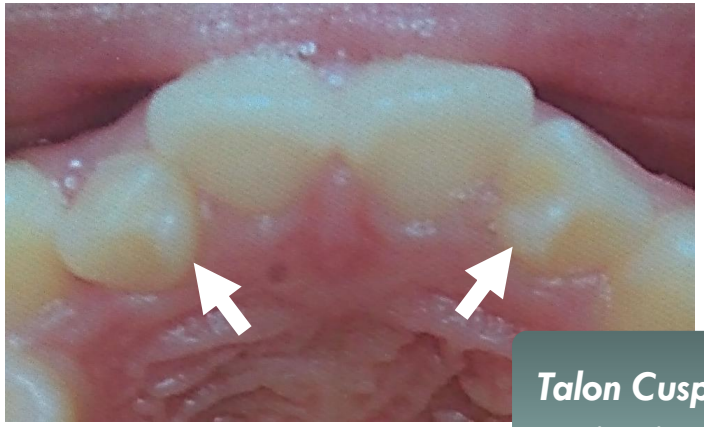
MAXILLARY LATERAL INCISORS

You can use both your central and lateral models in this section to compare the different features of the two incisors.

GENERAL FEATURES

- Maxillary laterals are like centrals but usually in **smaller dimensions**, except in root length.
- They also exhibit morphologic variations like a **peg lateral** (microdontia), **talon cusp** or **missing tooth**.

Peg Lateral: tooth is small and somewhat conical in shape where it tapers from cervical to incisal



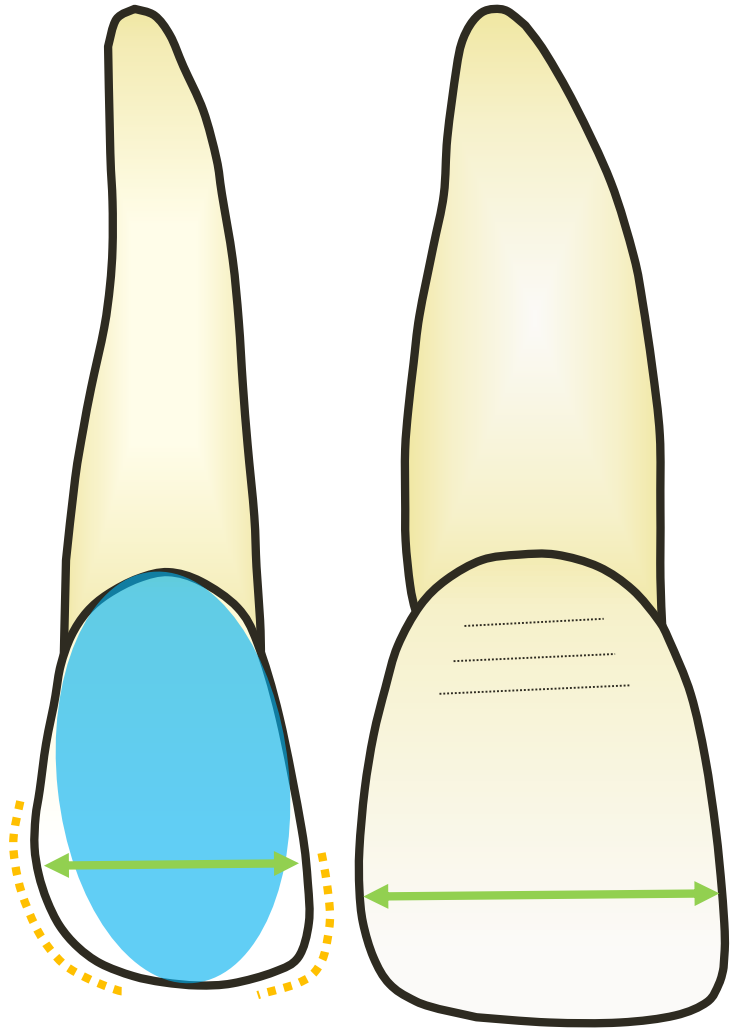
Talon Cusp: a small projection on the lingual surfaces of maxillary or mandibular anteriors

PONDER THIS…

What do you think are the implications of the different morphologic variations of maxillary laterals?

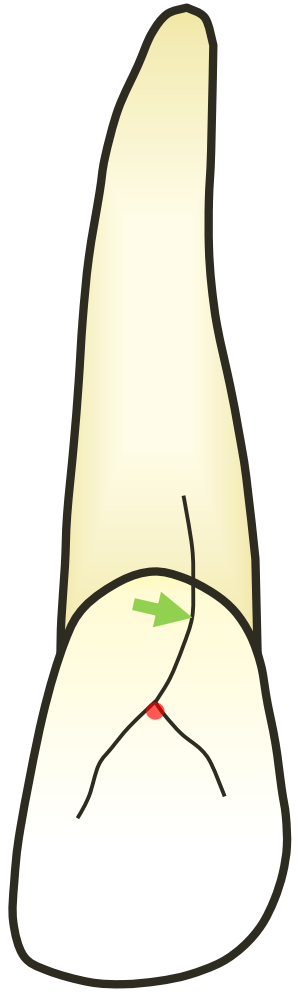
LABIAL

- More **convex** than centrals
- More **oblong** cervicoincisally, **narrow** mesiodistally
- **Rounded** incisal ridges and incisal angles
- Root tapers evenly toward the rounded apex, and the apical end is commonly bent distally



LINGUAL

- More concave (deeper) lingual fossa
- **Narrower** but more prominent cingulum
- **Lingual pit** beneath cingulum
- **LINGUOGINGIVAL FISSURE or PALATORADICULAR GROOVE**: developmental groove traversing the cingulum, usually at the distal side, from the lingual pit that may extend to the root area

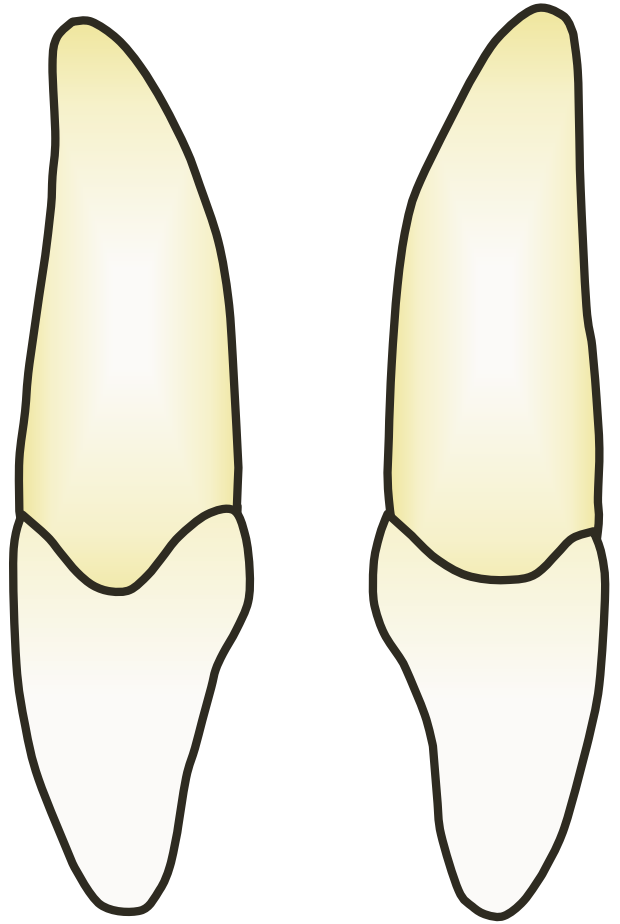


PONDER THIS…

What is the implication of having the linguogingival fissure present on a maxillary lateral?

PROXIMAL

- Short crown, long root
- Incisal portion appear thicker than centrals
- Root appears as a tapered cone with a bluntly rounded apex
- Cervical line is deeper in the mesial than distal
- Width of the crown appears thicker on the distal than mesial
- Uncommon to find a developmental groove on the distal from crown to root

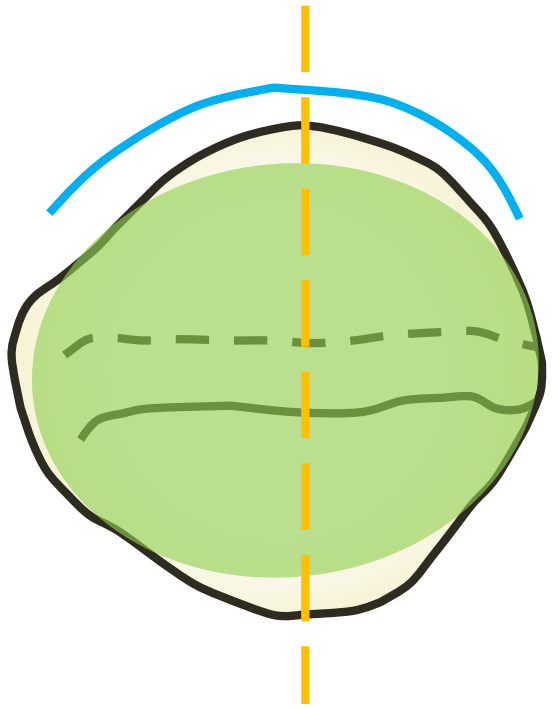


PONDER THIS…

Why do you think the width of the crown appears to be thicker on the distal than mesial aspect?

INCISAL

- May resemble a central or canine
- Outline is more **round** than triangular, labial contour is more **convex**
- Cingulum is **nearly centered** mesiodistally

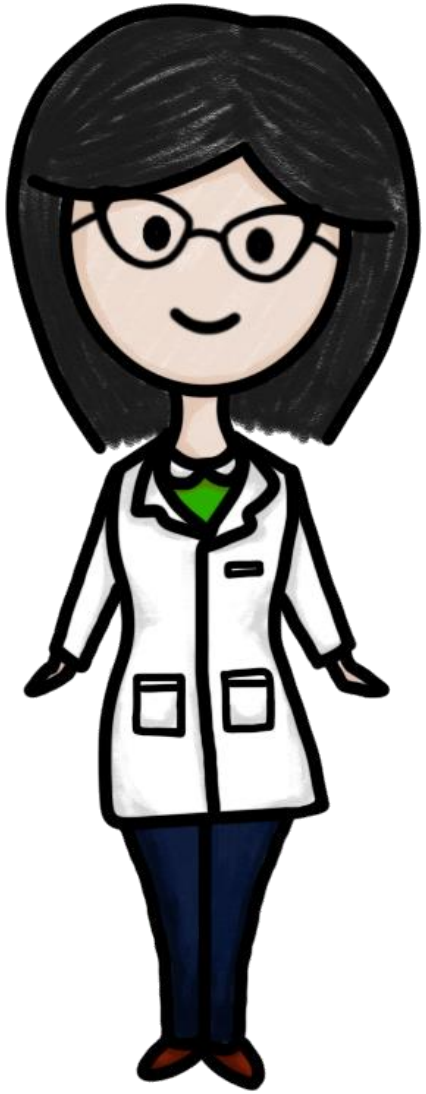


HOW ARE YOU?

Congratulations! Hopefully, you'll now be able to identify the maxillary incisors from a handful of teeth.

Take a ten-minute breather. You're half-way done with this lecture.

When you're ready, proceed to the next slide.



MANDIBULAR INCISORS

Let's do this!

GENERAL DESCRIPTION

- 4 mandibular incisors: 2 centrals, 2 laterals (FDI, Universal)
- Centrals are the **only tooth with only one antagonist** apart from 3rd molars
- Smaller mesiodistal dimensions and are nearly same size
- Flatter on mesial and distal sides
- Crowns and roots are **wider labiolingually** than mesiodistally
- Smoother lingual surfaces
- Erupt:
  - Centrals 6-7 y/o
  - Laterals 7-8 y/o

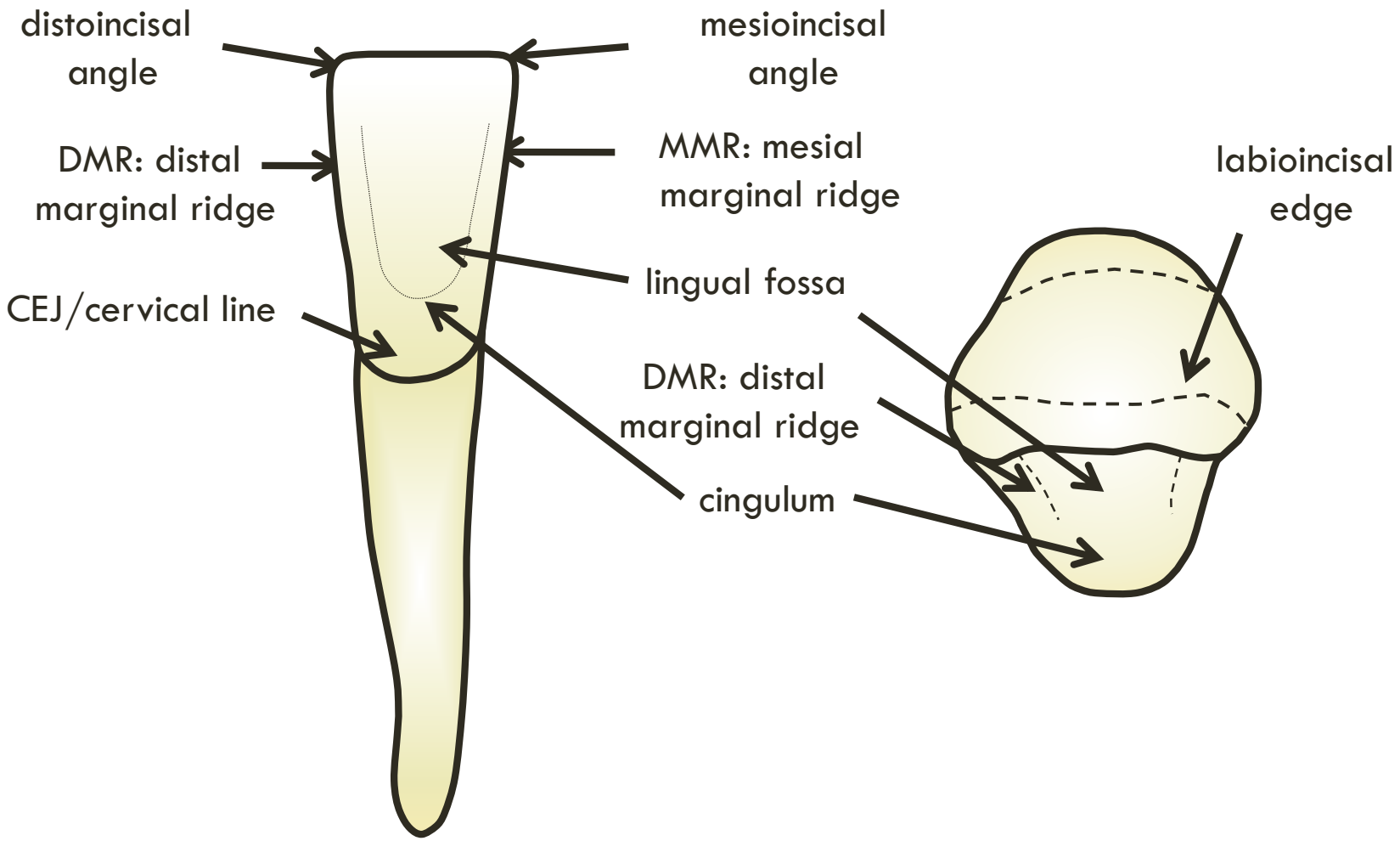
MANDIBULAR CENTRAL INCISOR

Take out your mandibular central model and try to compare the text with the features of your model.

GENERAL FEATURES

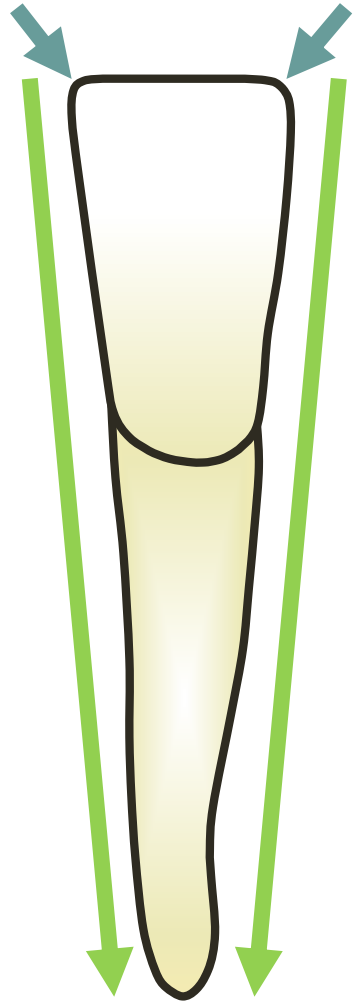
- **Smallest** tooth in the dental arch
- It is the **most bilaterally symmetrical tooth** with a very straight incisal edge
- Smaller than lateral incisor

LANDMARKS


distoincisal angle
mesioincisal angle
DMR: distal marginal ridge
MMR: mesial marginal ridge
labioincisal edge
lingual fossa
CEJ/cervical line
DMR: distal marginal ridge
cingulum

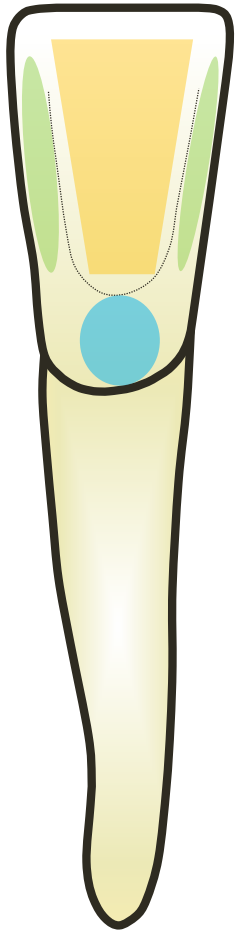
LABIAL

- **Tapers evenly** from the incisal angles to the apex of the root
- Mesioincisal and distoincisal angles are **sharp**, nearly right angles
- Root tapers uniformly on both sides and labial surface is convex
- Show **few traces** of developmental lines



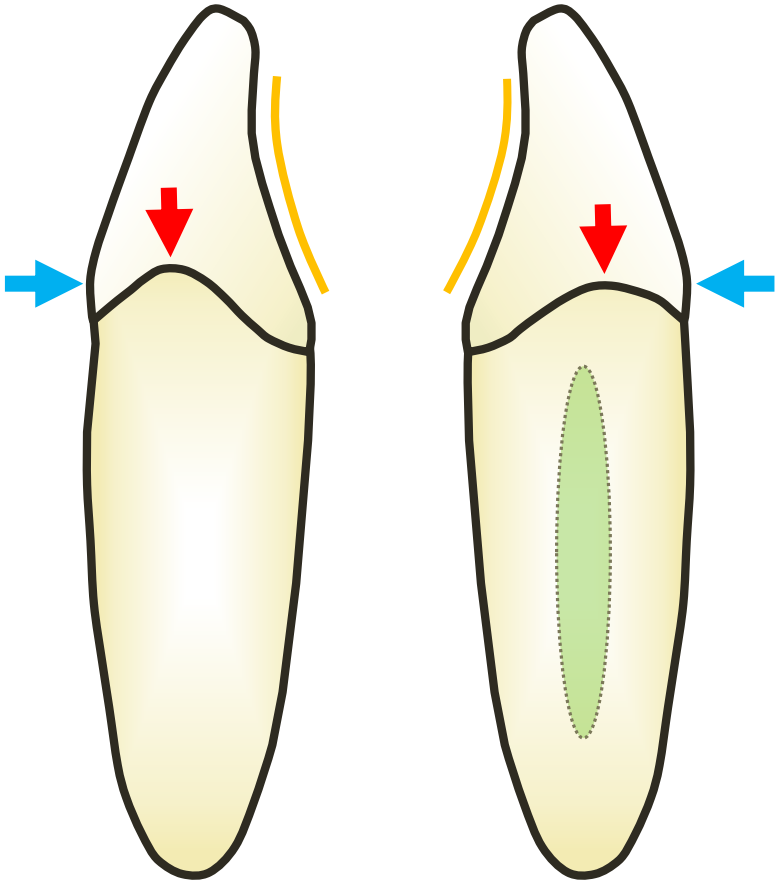
LINGUAL

- Smooth and shallow, slightly concave ***(lingual fossa)***. No grooves, accessory ridges or pits
- Mesial, distal and incisal outlines are the same as in labial view
- Flat at the incisal third, convex at the cervical with the **cingulum** small and centered
- **Marginal ridges** are inconspicuous



PROXIMAL

- Labial outline is flat above the **cervical (crest of) curvature**
- Lingual outline is straight above the cingulum then concave at the middle third *(orange)*
- Cervical curvature is more convex on the mesial surface *(red)*
- Root outline is straight and starts to taper at the middle third area
- A marked **developmental depression** on the distal surface of the root may be present

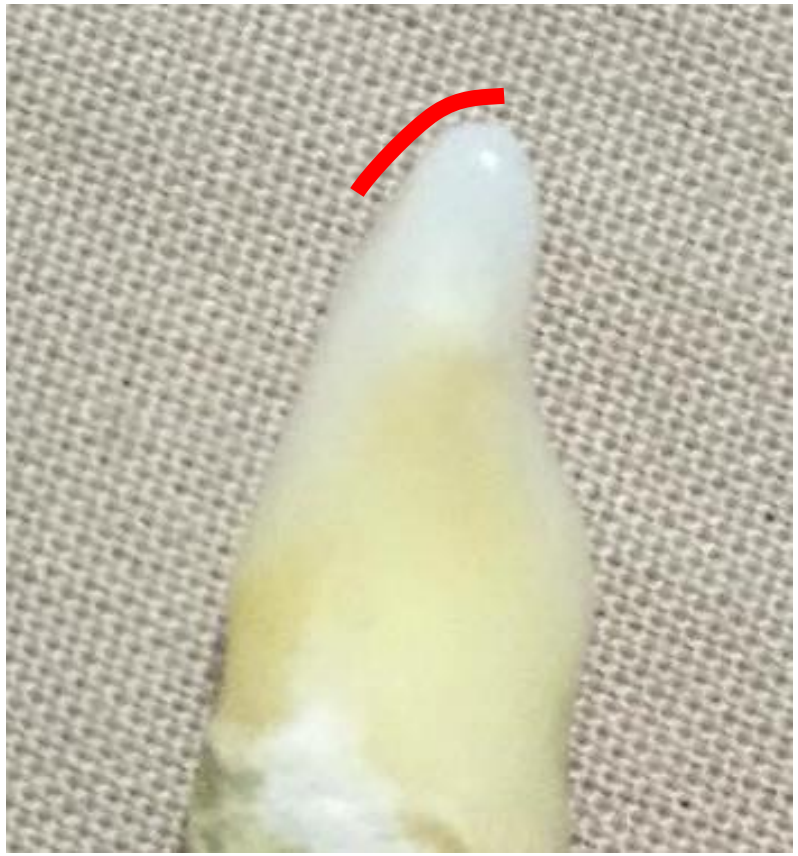


PROXIMAL

PONDER THIS…

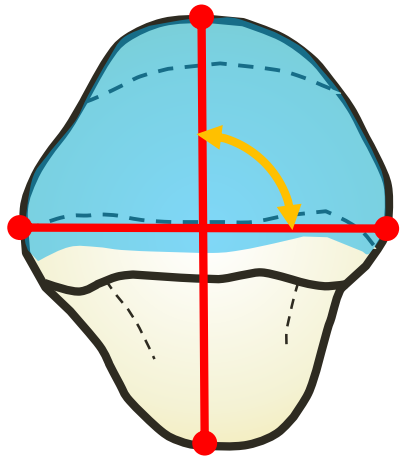
Why do you think the incisal edge of this specimen slopes to the labial/facial?

It's actually the opposite of its maxillary counterpart.



INCISAL

- Shows the **bilateral symmetry** of the tooth
- Incisal edge is almost at right angles to a line bisecting the crown labiolingually *(orange)*
- Labiolingual diameter is **greater** than the mesiodistal diameter
- More of the labial surface is seen than of the lingual surface *(blue)*



MANDIBULAR LATERAL INCISORS

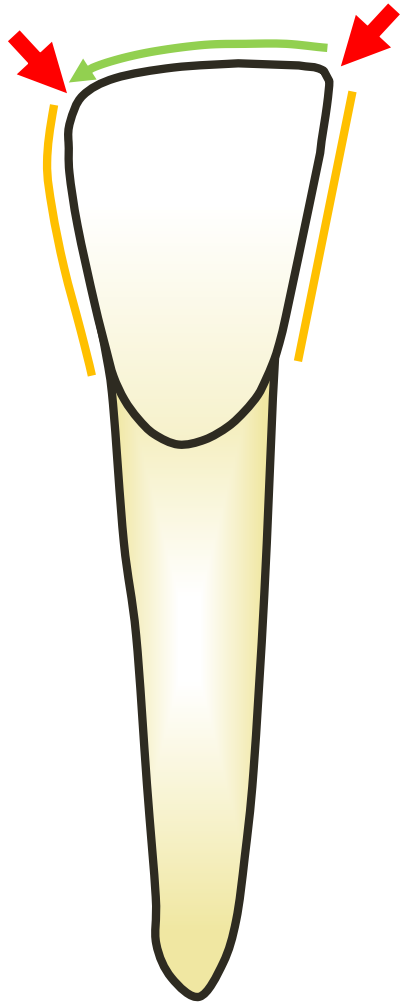
You can use both your central and lateral models in this section to compare the different features of the two incisors.

GENERAL FEATURES

- Slightly **larger** than centrals
- Form closely resembles centrals
- Crown less symmetrical than centrals, more convex
- Crown is tipped slightly distally
- Incisal ridge curves to the distal

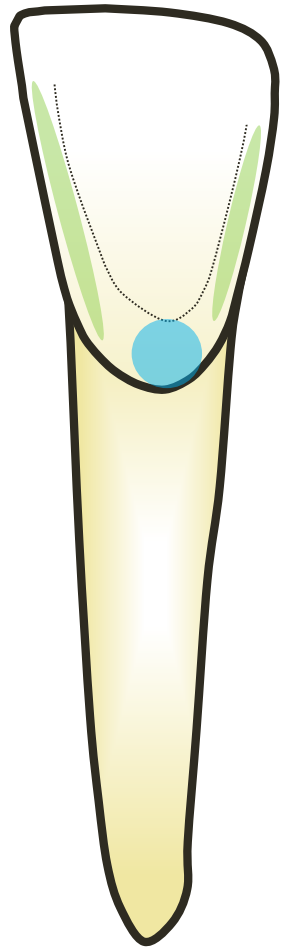
LABIAL

- Distal side is more convex than the flatter mesial outline *(orange)*
- Distoincisal angle is more round than mesioincisal angle *(red)*
- Incisal edge sloping towards the distal *(green)*
- Root appears narrow mesiodistally and taper gradually towards the apex that may curve slightly to the distal



LINGUAL

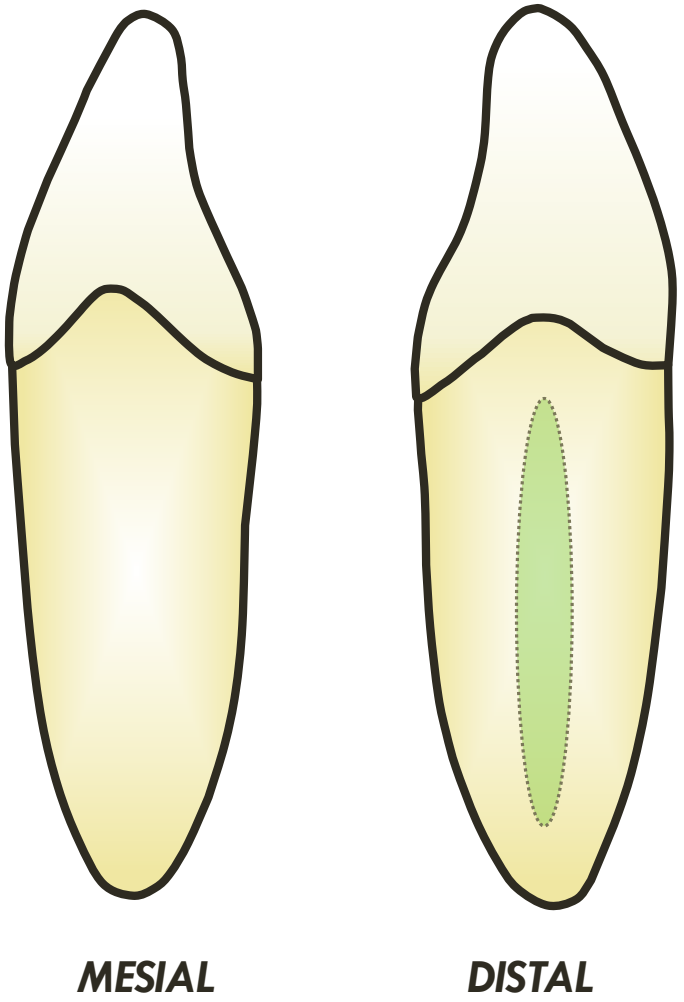
- Outline is **mirror-image** of the labial aspect
- **Cingulum** rests slightly distal to the axis line of the root making the mesial marginal ridge slightly longer than the distal marginal ridge *(green)*
- Generally **smooth** lingual surface like centrals



PROXIMAL

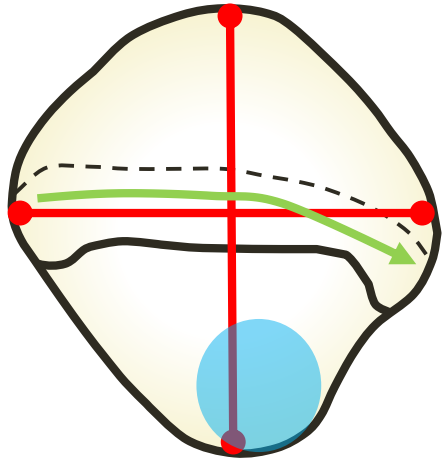
- **Same** characteristics as centrals
- More distinct **root depressions** on the distal surface than mesial surface

PONDER THIS…
What do you think is the implication of having root depressions on the teeth in the clinical setting?



INCISAL

- **DISTOLINGUAL TWIST:** incisal edge follows the curvature of the dental arch (curves towards the distal and lingual)
- Cingulum is **off-center** to the distal
- Bilateral symmetry
- Labiolingual diameter is wider than mesiodistal diameter *(red)*

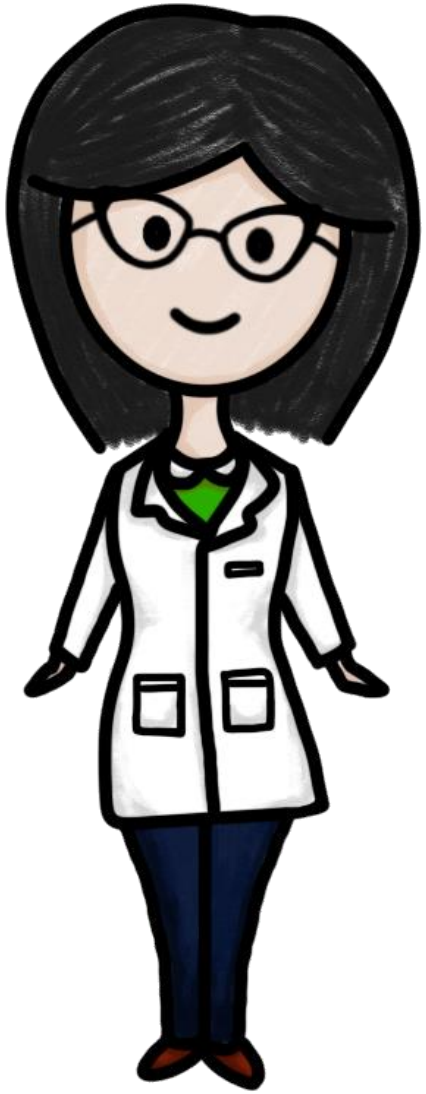


CONGRATULATIONS!

You just learned the features of your first set of teeth, the Incisors!

Do you think you can now identify the incisors by yourself?

Move on to the next slide for instructions on your practice exercise.



TRY THIS…

Get all your incisor teeth models and gather them all in your palm or in a container. Mix them all together and then try to identify them one by one. How will you go about it? Try these steps:

1. Classify the maxillary vs the mandibular teeth. If the tooth is maxillary, lay them down with the root pointing up. If the tooth is mandibular, lay them down with the root pointing down.
2. Then go about it according to arch. You can start with the maxillary incisors because they're easier to identify. Determine the labial surface so you're looking at it as if in a person's mouth. Review the different features of maxillary incisors.
3. Identify the mesial surface while you're looking at it from the labial. Remember that the mesial surface is the surface that is nearer the midline. Once you've identified it, position the model as if you have an imaginary midline. Never rely on just one characteristic or feature so you won't be confused. Also, focus your attention to the crown features rather than the root. Remember, on a patient, for you to identify a tooth in the oral cavity, you'll only see the crown most of the time.

REFERENCES

- Wheeler's Dental Anatomy, Physiology and Occlusion 7th Edition
- Dental Anatomy: Its Relevance to Dentistry 5th Edition by JB Woelfel and RC Scheid
- Interactive Guide to Oral Anatomy by Dr Michelle Sunico