Arrangement of the artificial teeth:
It’s the placement of the teeth on a denture with definite objective in mind or it’s the setting of teeth on temporary bases.

Rules of artificial teeth arrangement:
Maxillary cast
1- a line is drawn parallel to the frontal plane that touches the anterior margin of the incisive papilla aids in the positioning of the upper central incisors
2- the midline follows the mid palatal suture and bisects the incisive papilla this line is perpendicular to line 1.
3- the canine eminence line is recorded on the cast when its present

The center and base of the papilla used as reference

Mandibular cast:
1- a line is drawn parallel to the frontal plane bisecting the residual ridge aids in positioning of the mandibular central incisors
2- a point designates the distal of the mandibular canine
3- a line follow the crest of the residual ridge from the canine point to the middle of the retromolar pad aids in the buccolingual position of the mandibular posterior teeth.

4- a line that bisects the vertical height of the retromolar pad aids in establishing the vertical position of the occlusal surfaces of the posterior teeth.

![Image of teeth and lip](image)

**Arrangement of anterior teeth**

The anterior teeth should be arranged to provide:

1- proper lip support
2- permit satisfactory phonetic
3- pleasing esthetic

**A. arrangement of the upper anterior teeth**

**1- upper central incisor:**

*In the frontal view:* the contact points between right and left central incisors should coincide with the midline of the cast. The incisal edge of each one should touch the occlusal plane. The long axis is perpendicular to the plane.

*In the sagittal view:* should have slight labial inclination (5 degree)
In the occlusal plane (horizontal):
the two central incisors should be placed to give the beginning of the curvature of the arch. Generally, the labial surfaces of the two central incisors will be 8-10 mm anterior to the center of incisive papilla.

2- upper lateral incisor:
   In frontal view: the incisal edge is 1 mm above the occlusal plane and the long axis show little distal inclination.
   In the sagittal view: the upper lateral incisor should have slight labial inclination (10 degree).
   In the horizontal view: the cervical area is depressed more than the central incisors and the distal edge should be rotated to form the arch curvature.
3- upper canine:

*In frontal view:* the tip of the canine should touch the occlusal plane and the long axis is perpendicular to the plane.

*In the sagittal view:* the long axis is vertical.

*In the horizontal view:* The upper canine represents the upper corner of the mouth and the turning point of upper arch also it forms the transition from the anterior teeth to posterior teeth.

![Image of teeth showing upper and lower canines](image)

**Arrangement of the lower anterior teeth:**

1- lower central incisor:

*In frontal view:* the long axis is vertical and the midline of the lower centrals should coincide with the maxillary mid line.

*In sagittal view:* should have slight labial inclination. The incisal edge should have 1 mm of vertical overlap (overbite) and 1mm of horizontal overlap (overjet) in respect to maxillary central incisor.

![Image of teeth showing lower incisors](image)
**Overbite (vertical overlap)**
It is the extension of the upper anterior teeth over the lower teeth in a vertical direction when the opposing posterior teeth are in contact in centric occlusion.

![Normal](image1)

![Moderate](image2)

![Severe](image3)

**Overjet (horizontal overlap)**
It is the projection of upper anterior teeth beyond their antagonists in a horizontal direction.

![Diagram](image4)
2- lower lateral incisor:

*In frontal view:* the long axis has slight distal inclination to the occlusal plane

*In sagittal view:* is fairly upright and the incisal edge should be 1 mm of horizontal and vertical overlap in respect to central incisor.

*In horizontal view:* the distal edge rotated lingually to have the arch curvature

3- lower canine:

*In frontal view:* the long axis has slight distal inclination and the tip of lower canine should be placed in the embrasure between upper lateral and upper canine.

*In sagittal view:* the long axis has slight lingual inclination

*In horizontal view:* the cervical area is prominent.

The arrangement of anterior teeth should follow the form of the arch which is either square, tapered or ovoid.

![Diagram of teeth]

*Arrangement of the posterior teeth:*

Correct placement of posterior teeth is important for the retention and stability of both dentures.

Prior to arrangement of the posterior teeth we must understand some of the definitions which is related to posterior teeth arrangement:
1- **Curve of spee:** The curvature of the mandibular occlusal plane beginning at the tip of the lower incisors and following the buccal cusps of the posterior teeth, continuing to the anterior border of the ramus.

![Image](image1.png)

2- **Christensen’s phenomenon:**
A gap occurring in the natural dentition or between the opposing posterior flat occlusal rims when the mandible is protruded (posterior open bite) it can lead to instability in full denture unless compensating curve are incorporated into the denture.

![Image](image2.png)
3- **Compensating curve:**
The antero-posterior and lateral curvature in the alignment of the occluding surfaces and incisal edges of the artificial teeth which is used to develop balanced occlusion

4- **Curve of Wilson (lateral curve)**
Curvature in a frontal plane through the cusp tips of both the right and left molars (buccal and lingual cusps). Such curvature is concave with the lower point in the middle due to lingual inclination of the long axis of the mandibular molars.
(take its name from Dr. George H. Wilson who first described it in 1911).

*Curve of Wilson helps in two ways:*
A. teeth are aligned parallel to the direction of medial pterygoid (closes the jaw) for optimum resistance to masticatory forces.
B. the elevated buccal cusps prevent food from going past the occlusal tables.
1. **Arrangement of maxillary posterior teeth:**

   **a. Maxillary premolars:**

   1. Premolars are set vertically to occlusal plane (a plane passing through the occlusal surfaces of the teeth).

   2. Buccal cusp of maxillary 1st premolar touch the occlusal plane while the palatal cusp is raised from occlusal plane approximately 1\(\frac{1}{2}\) mm

   3. Buccal and palatal cusp of maxillary 2\(^{nd}\) premolar touch the occlusal plane.

   4. The buccal cusp of maxillary 1st premolar should be seat into the embrasure between the mandibular 1st and 2nd premolars.

   5. Palatal cusp should be over the crest of the ridge.

   **b. Maxillary molars:**

   1. The inclination of maxillary molars are mesially and slightly palatally.

   2. Mesiopalatal cusp of maxillary 1\(^{st}\) molar should touch the occlusal plane and the lingual cusps are over the crest of the mandibular ridge.

   3. The mesiobuccal cusp of upper 1\(^{st}\) molar should rest in the buccal groove of the lower 1\(^{st}\) molar, and the Mesiopalatal cusp should seat into the central fossa of lower 1\(^{st}\) molar.

   4. Maxillary 2\(^{nd}\) molar is set with no cusp touches the occlusal plane. All the palatal cusps are over the crest of the mandibular ridge.
5. Buccal cusps of maxillary teeth form a gentle curve, while the palatal cusps form a similar curve about 1/2 mm below the buccal cusps.

6. Use a template to check the buccal alignment of canine, premolars and mesial buccal cusp of maxillary 1st molar should touch the template, while the distobuccal cusp not touch.

7. To check the buccal alignment of maxillary posterior teeth, all four cusps of maxillary molars touch the template while the premolar do not touch the template.
Arrangement of the lower posterior teeth:

The lower posterior teeth will be arranged before the upper posterior because there are more anatomical landmarks to locate the guide lines are:
1- the line of the crest of lower residual ridge which extend between the middle of retromolar pad and tip of lower canine. the central grooves of the lower posterior teeth should coincide with this line
2- the line extending between the tip of the lower canine and upper 2/3 of retromolar pad will determine the height of lower posterior teeth.

The procedure:
1. The Mandibular 1st molar is first set into centric occlusion.
2. Mesio-buccal cusp of maxillary 1st molar fit into the buccal groove of mandibular first molar.

3. The mesiolingual cusp of Mandibular 1st molar fit into the central fossa of the maxillary first molar.
4. Set the mandibular 2nd molar the mesio-buccal cusp of maxillary 2nd molar fit in to the buccal groove of mandibular 2nd molar.
5. Then set mandibular 2nd premolar, its cusp tip should be positioned in the embrasure between maxillary 1st and 2nd premolars.
6. The last tooth are mandibular 1st premolar which should be position in the
embrasure between maxillary canine and maxillary 1st premolar.

7. Mandibular premolars follow the curvature of the canine.

8. Mandibular posterior teeth are set on or slightly lingual to the crest of the ridge.

**Common errors in arrangement of teeth:**
1- Setting mandibular anterior teeth too forward in order to meet maxillary teeth.

2- Failure to make the canine turning point of the arch.

3- Setting mandibular 1st premolar to the buccal side of canine.

4- Failure to establish the occlusal plane at the proper level and inclination.

5- Establishing the occlusal plane by an arbitrary line on the face.

6- Lack of rotation of anterior teeth to give a narrower effect.

7- Setting the mandibular posterior teeth too far to the lingual side in the 2nd molar region which cause tongue interference and mandibular denture displacement.