

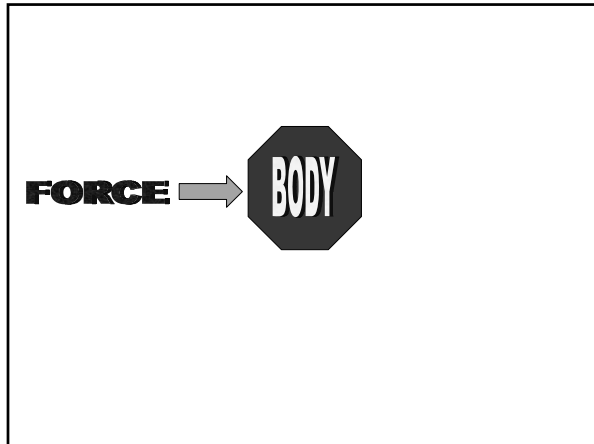
- Mechanics: The science which deals with the action of forces on the form and motion of bodies



- Force: Energy or strength brought to bear causing **motion** or change in a body.

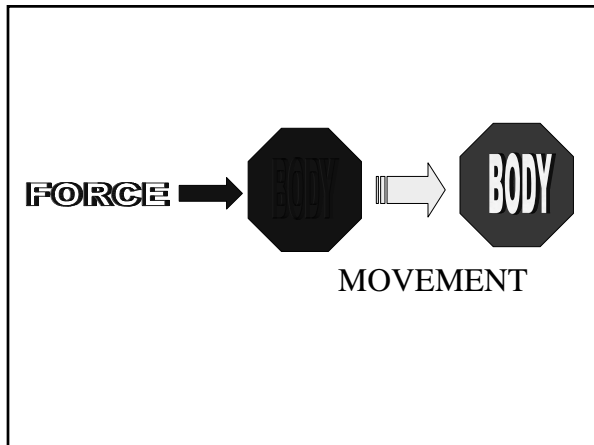
BIOMECHANICS OF TOOTH MOVEMENT

- Orthodontic appliance: A system storing and delivering forces against the teeth, muscles, and/or bones; creating a reaction within the periodontal ligament and alveolar bone that causes movement of the teeth or alters bone morphology or growth.



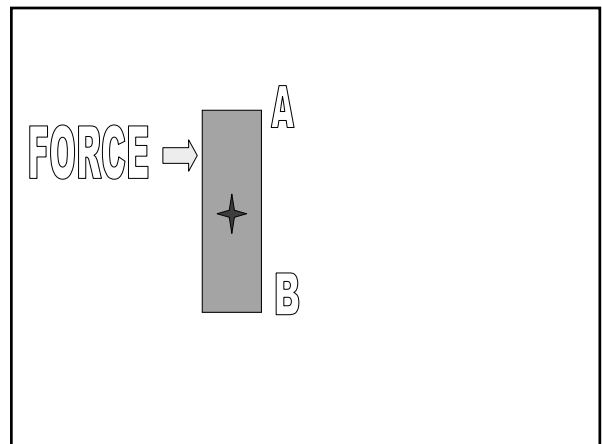
FORCE

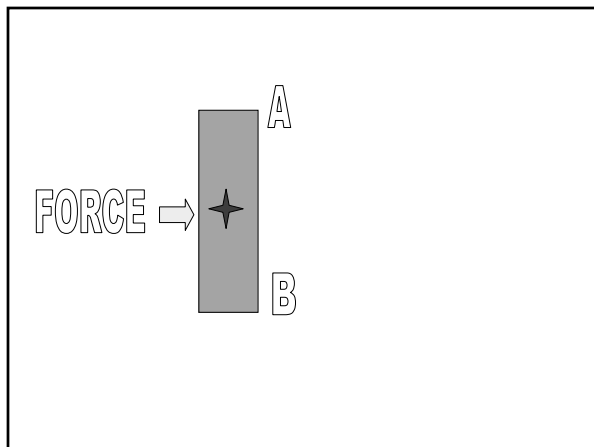
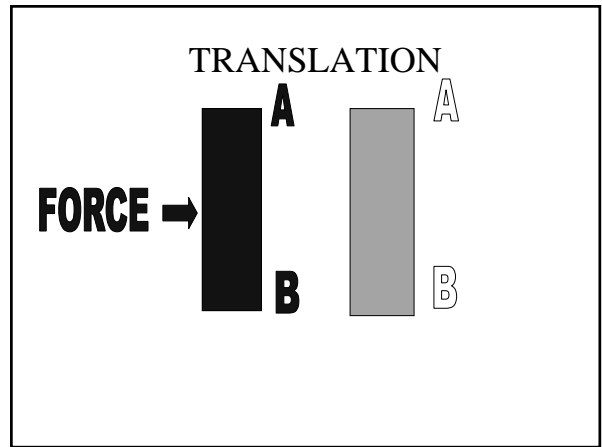
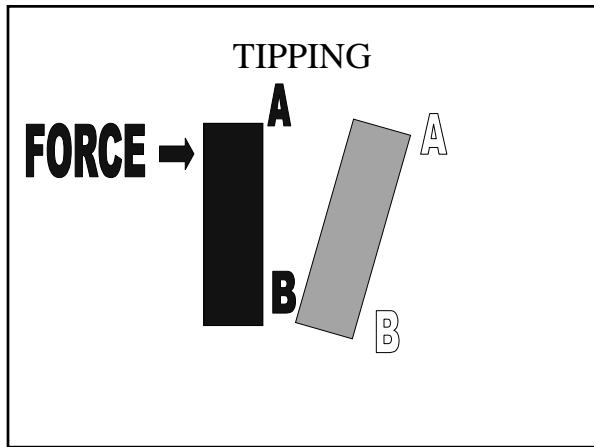
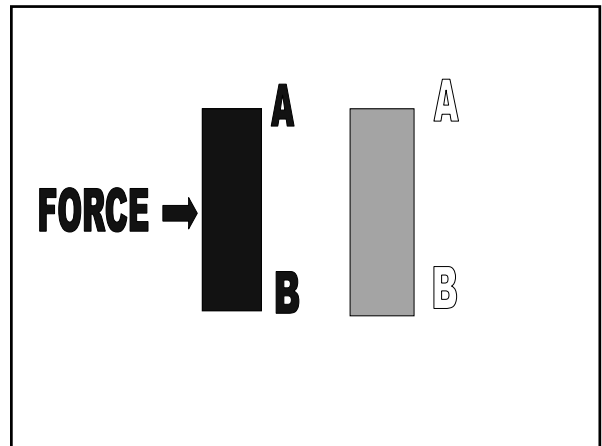
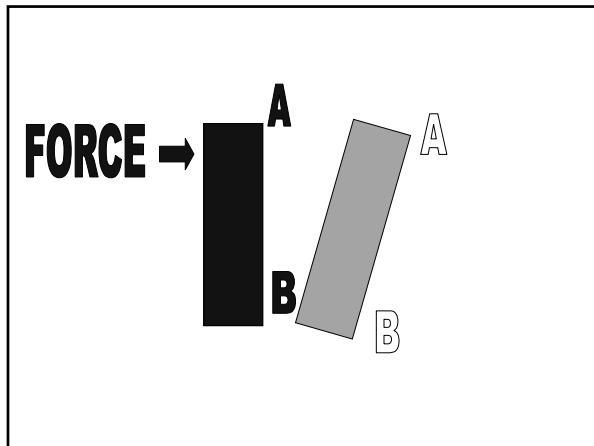
Magnitude
Point of application
Direction



- Center of Resistance: The center of mass or center of gravity

FORCE

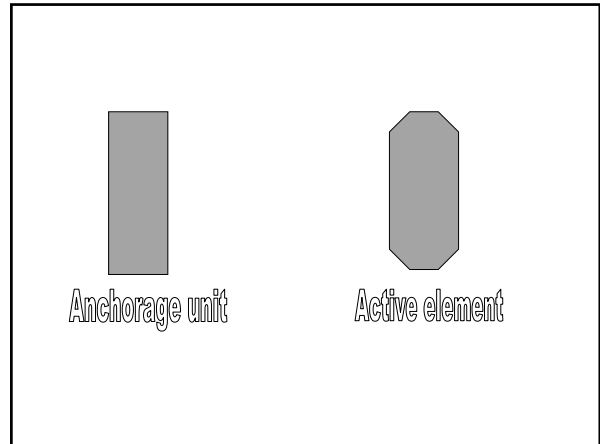




Orthodontic appliance

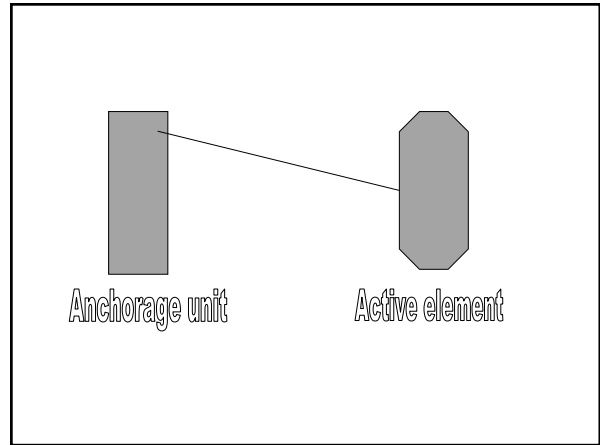
- Active element
- Resistance element

- Anchorage: Resistance to displacement
- The anchorage unit can move, however its role is to provide resistance.

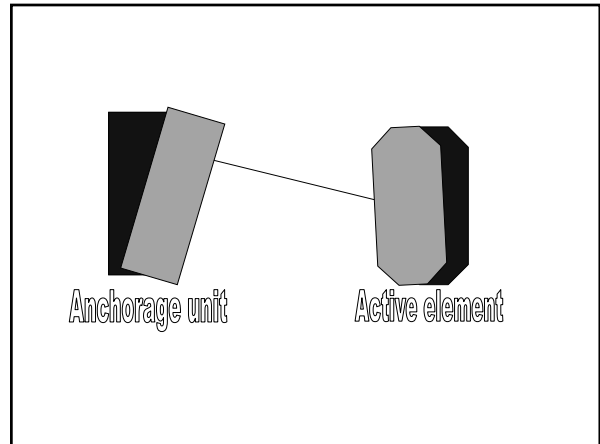


Anchorage is classified according to:

1. Manner of force application
 - a. Simple anchorage

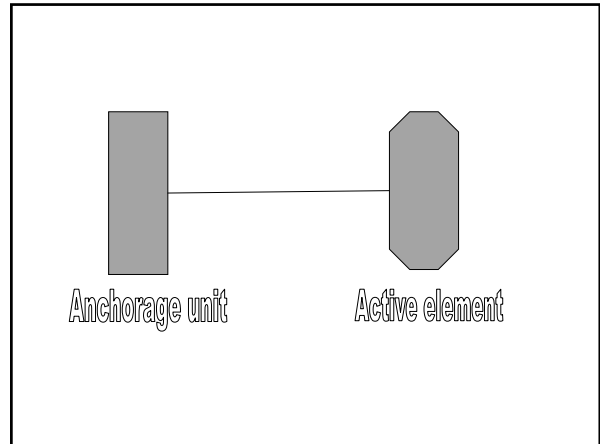


Simple anchorage (resistance to tipping):
the anchorage tooth is 'free' to tip during movement

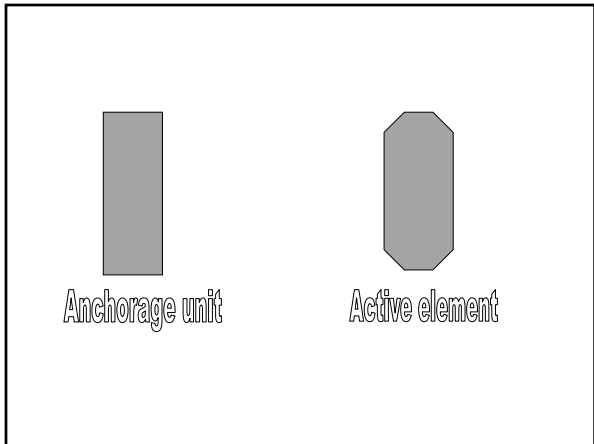
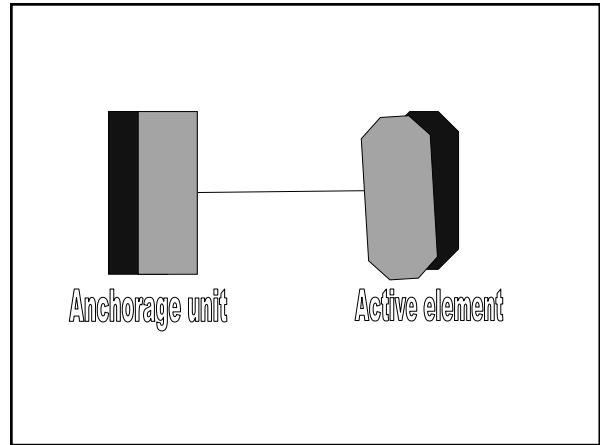


Anchorage is classified according to:

1. Manner of force application
 - a. Simple anchorage
 - b. Stationary anchorage



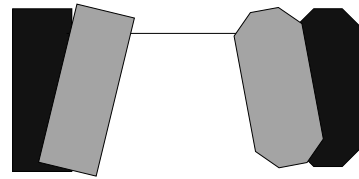
Stationary anchorage (resistance to bodily movement): the anchorage tooth is permitted to translate only.



Anchorage is classified according to:

1. Manner of force application
 - a. Simple anchorage
 - b. Stationary anchorage
 - c. Reciprocal anchorage

- Reciprocal anchorage: where both bodies which are malposed act as resistance and active elements.



Anchorage unit
Active element

Anchorage unit
Active element



Anchorage unit
Active element



Anchorage unit
Active element

Anchorage is classified according to:

1. Manner of force application
 - a. Simple anchorage
 - b. Stationary anchorage
 - c. Reciprocal anchorage
2. According to the jaws involved
 - a. Intra-maxillary anchorage

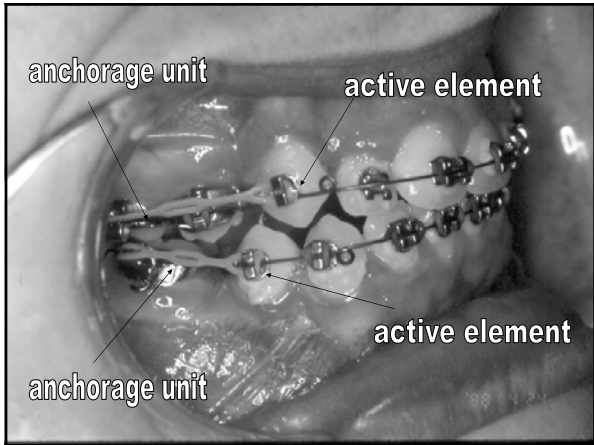
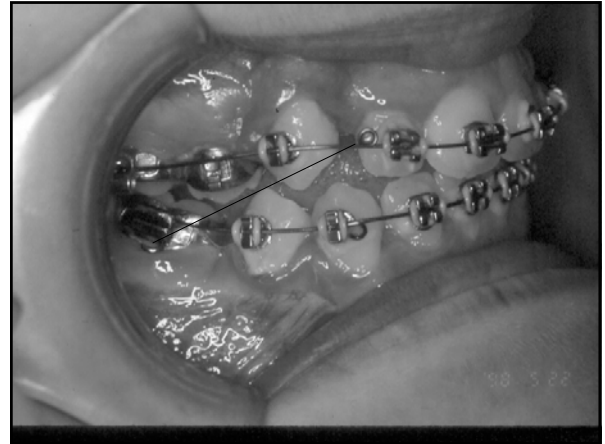
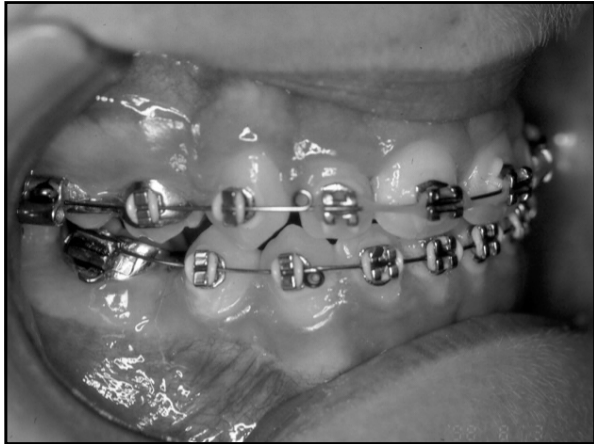


Anchorage unit
Active element



Anchorage unit
Active element

Intra-maxillary anchorage: anchorage established in the same jaw as the active element.



- Inter-maxillary anchorage – anchorage established in the opposite jaw of the active element

3. Site of anchorage

- a. Intra-oral; utilizing the teeth, mucosa and other oral structures

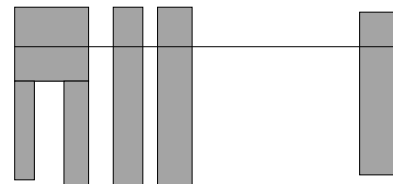
3. Site of anchorage

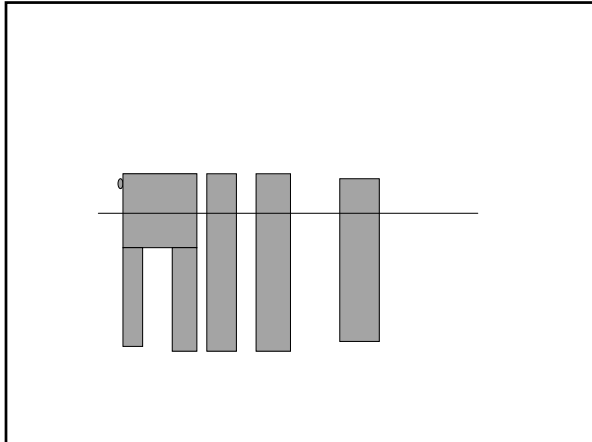
- a. Intra-oral; utilizing the teeth, mucosa and other oral structures
- b. Extra-oral; anchorage established outside of the oral cavity



- Cervical
- Occipital
- Cranial
- Facial

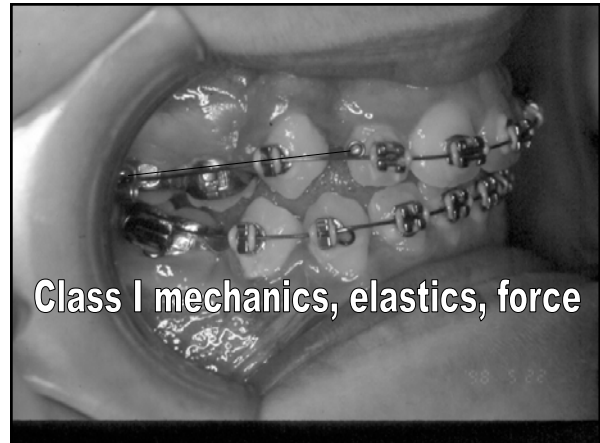
- 4. Number of anchorage units; the number of teeth, number of roots





- A couple produces pure rotation.
Tendencies for translation are canceled out.

- Couple – Produced by two forces of equal magnitude with opposite, parallel, but non-collinear lines of action.



- A couple produces pure rotation.
Tendencies for translation are canceled out.

