The Speech Mechanism

- Speech is an overlaid function
  - there are no organs whose primary function is to produce speech
- Articulators - parts of the speech mechanism that serve to produce different configuartions which make up different sounds

Four Parts of the Speech Mechanism

- Oral Cavity
- Nasal Cavity
- Pharynx
- Larynx

Oral Cavity (oro/oral)

- Lips (labio/labial) - bounded by the cheeks, chin, and nose
  - orbicularis oris - "lip muscle" that can contract to round, protrude, or spread the lips to make various speech sounds
  - philtrum - grooved indentation in the center of the upper lip
  - vermilion - adaptation of the mucous membrane that lines the mouth; reddish color
  - sounds produced at lips
    - bilabial /p, b, m, w/
    - labio-dental /f, v/

Oral Cavity (con't)

- Teeth (dento/dental)- important for sounds involving "lip & teeth" and "tongue & teeth"
  - labio-dental sounds /f, v/ ("lip + teeth")
  - lingua-dental sounds /□, □/ ("tongue + teeth")
  - Dental occlusion - how the teeth fit together when you bite down
  - abnormal bite is a "malocclusion"
    - neutrocclusion (normal jaw relationship)
    - distocclusion (retruded mandible)
    - mesiocclusion (protruded mandible)

Oral Cavity (con't)

- Alveolar ridge (alveolo/alveolar) - gum ridge
  - sounds made at alveolar ridge -
    - /t, d, l, n, s, z/

Oral Cavity (con't)

- Hard palate (palato/palatal) - anterior roof of mouth
  - bone covered with membrane
  - sounds made at hard palate
    - /tʃ, dʒ, j, ʃ, ʒ/

Oral Cavity (con't)

- Velum (velo/velar) - soft palate
  - movable fold of mucuous membrane that is continous with hard palate
  - divides oral cavity from nasal for non-nasal sounds --> is LOWERED for nasal sounds
  - sounds made at velum - /k, g, □/
  - uvula - "little grape"
    - serves little function in humans

Oral Cavity (con't)

- Tongue (lingua/lingual) - most important of the articulators
  - muscular organ capable of intrinsic (finer shapes) and extrinsic movements (responsible for up/down; backward/forward)
  - divided into parts:
    - tip
    - front or blade - beneath alveolar ridge
    - middle - beneath hard palate
    - back - beneath velum
    - root - most posterior part of tongue

Oral Cavity (con't)

- Mandible (mandibulo/mandibular) - lower jaw
  - regulates the size of opening beneath teeth
  - tongue is connected to mandible by the *lingual frenum* which attaches tip and blade of tongue to floor of mouth

Oral Cavity (con't)

- Facial muscles - important in controlling cheeks and size of mouth
  - aids in building intra-oral breath pressure

Nasal Cavity (naso/nasal)

- Extends from the nostrils (nares) to pharynx (throat)
- important in resonance by opening or closing of velopharyngeal port
  - velopharyngeal valve or port is formed by the soft palate making contact with the pharyngeal wall
  - must be closed for vowels and non-nasal consonants

Pharynx (pharyngo/pharyngeal)

- Throat
- extends from the posterior portion of the nasal cavity downward through the back of the oral cavity to the larynx
- pharynx is a vertical tube with 3 parts

Pharynx (con't)

- Nasopharynx - continuation of the nasal cavity
  - uppermost part of pharynx; directly behind nasal cavity
  - nasopharynx can be closed off from the oropharynx where they join at the velopharyngeal port
- Oropharynx - continuation of the oral cavity
  - opens to mouth
  - very versatile in assuming a variety of configurations
- Laryngopharynx - area just above larynx
  - vibrating mechanism that houses the vocal folds
  - sits on top of trachea

Larynx

- Two purposes of larynx
  - Prevent food from going into trachea
    - epiglottis -- leaf-like cartilage below root of tongue and at junction of oropharynx and laryngopharynx
    - covers glottis during eating and drinking to prevent food and liquids from going into lungs
  - Create a constriction in vocal tract which produces a sound source for communication

Anatomy of Larynx

- cricoid cartilage - bottom ring of larynx that sits on top of trachea
  - looks like a signet ring
- artynoid cartilages - mobile, paired, pyramid-shaped cartilages that sit on top of cricoid cartilage
  - they attach to the vocal folds so that movement of the arytenoid cartilages moves the vocal folds

Anatomy of Larynx (con't)

- thyroid cartilage - largest structure of larynx
  - shield-shaped cartilage that protects vocal folds
  - referred to as "Adam's apple"
- hyoid bone - only bone in body not connected to other bones
  - attached to muscles and ligaments involved in swallowing and phonation
  - is a horse-shoe or "U"-shaped bone just above thyroid cartilage

Anatomy of Larynx (con't)

- Vocal folds - mucous membranes that attach separately to the arytenoid cartilages in back of larynx and come together in front at angle of thyroid cartilage

- Positions of vocal folds
  - open (abducted) - for normal inhalation/ exhalation
  - closed (adducted) - for phonation

Anatomy of Larynx (con't)

- Glottis -- opening in the vocal folds
  - two sounds produced at level of glottis /h, □/
- vocal folds vibrate to produce voicing
- middle of vocal folds vibrate to produce voicing