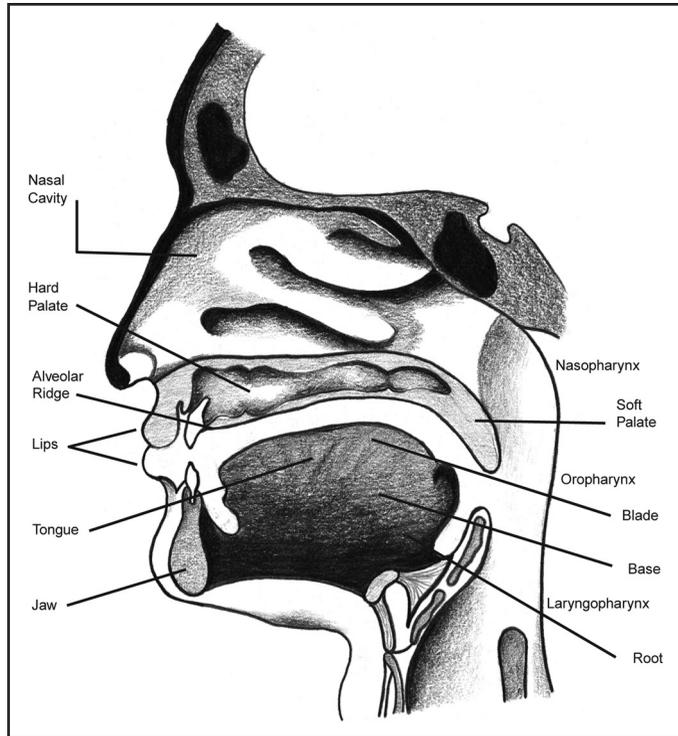


**Figure 2-1.** Major human articulators.

clinician helps the child discover adult phonology. Although these two approaches to speech production disorders appear significantly different in etiology and treatment, they overlap and are similar. There is a strong relationship between the discovery of phonological processes and traditional phoneme acquisition (Culbertson & Tanner, 2001a), on the one hand, and dependence of neuromotor oral maturation on phonological development, on the other (Culbertson & Tanner, 2001b). There is also a strong relationship between the muscles of speech articulation and their function in deglutition (Culbertson & Tanner, 2012).

## *Articulatory Anatomy and Physiology*

The articulators can be divided into fixed and mobile and soft and hard. The primary fixed articulators are the hard palate, alveolar ridge, and upper incisors. The mobile articulators are the tongue, velum (soft palate), mandible, and lips. The main soft articulators are the lips, tongue, and velum, and the primary hard articulators are the teeth, mandible, hard palate, and alveolar ridge. Figure 2-1 shows the human articulators.

As Figure 2-1 shows, the hard palate extends across the top of the oral cavity. The palatal vault is the dome-shaped top part of the oral cavity and houses the resting tongue. The palatal vault can be considered high, medium, or low, and in most persons it has a discernible shape: trapezoid, triangular, or oval. The positioning of the tongue relative to the palatal vault gives most speech sounds, especially vowels, their distinctive acoustic qualities. The alveolar ridge, the tissue just behind the upper incisors at the front (anterior) of the hard palate, is an important articulatory structure for the production of several consonants (see below). For example, the tip of the tongue contacts the alveolar ridge in the production of /t/, /d/, and /l/ sounds. It and the tongue are also important points of articulatory constriction for the /s/ and “sh” sounds. The upper incisors are a point of contact for the tongue and for the constriction of the airstream in the production of several phonemes, such as the voiced and voiceless “th.” The lips open and close in the production of bilabials such as /b/ and /m/ and have various degrees of rounding,