Three levels of respiration: external: gas exchange in lungs  
internal: gas exchange in tissues  
cellular: glucose “burned” with O₂ to CO₂

EMBRYOLOGY:
4 wk old fetus: laryngotracheal bud. forms as a ventral diverticulum in digestive tract just below pharynx
Elongates into trachea which branches and rebranches: bronchi, bronchioles, terminal bronchioles dilate to alveoli
Thus, entire respiratory tract epithelium is derived from endoderm
Connective tissue and smooth muscle components from mesoderm
Respiratory tree lining: pseudostratified ciliated columnar epithelium
Elasticity of lungs favor collapse, integrity of pleural space prevents

ANATOMY: (p. 8, KE 71, 72) external nares framed by cartilage plates:
alar, lateral nasal, nasal septum (forms vestibule of nose)
Septum: septal cartilage joins vomer, ethmoid perpendicular plate
Roof: ethmoid cribiform plate, houses olfactory epithelium
Lateral walls: conchae (2 on ethmoid) plus inferior concha (turbinate)
Floor: hard palate formed by palatine bone and palatine processes of maxilla, soft palate fleshy
Meatus: recess between conchae.
Four paranasal sinuses lighten skull, resonance chambers, produce mucous: (p 836: poor)
frontal drainage: middle meatus
sphenoid drainage: above superior conchae
ethmoid drainage: (many!): 14) superior and middle dorsal meatus
maxillary drainage: middle meatus
nasolacrimal duct drainage: inferior meatus

Mucus membrane on conchae “air conditions” inspired air:
1) warms, 2) moistens, 3) cleanses (traps particulates = post nasal drip)

Pharynx: (p 836) stratified squamous, connects mouth, nose, middle ear, larynx and esophagus
Nasopharynx eustachian tubes on post. wall
1) pharyngeal tonsils if swollen, termed adenoids
Oropharynx intersection with digestive tract
2) palatine tonsils line side walls, on either side of uvula
3) lingual tonsils embedded in base of tongue
Laryngopharynx contains epiglottis

LARYNX: framework of cartilage (9 pieces), suspended from hyoid bone (p. 838) cuneiform (“wedge shape”) and corniculate (“horn little”) not shown
thyroid cart: largest, thyrohyoid membrane ties to hyoid
epiglottis guards glottis
cricoid cart: below, mounted on “ring like” top of trachea
arytenoid cart: paired, tied to vocal “ladle like” cords, control pitch.
Thyroid-cricoid muscle: vocal pitch
ventricular folds, (vestibular folds) false vocal cords, subject to:
inflammation = laryngitis