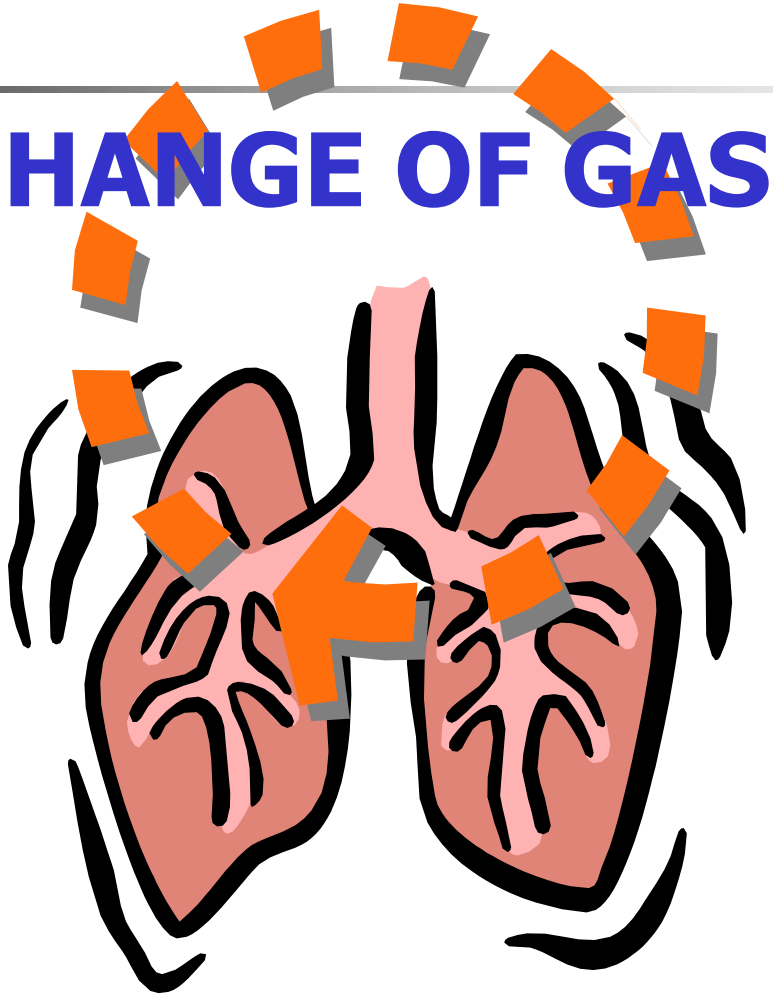
RESPIRATORY SYSTEM

EXCHANGE OF GASES



What is Human Respiration?

- The human respiratory system allows one to obtain oxygen, eliminate carbon dioxide.
- Breathing consists of two phases, inspiration and expiration
  - Inspiration- the process of taking in air
  - Expiration- the process of blowing out air

Human Respiratory System

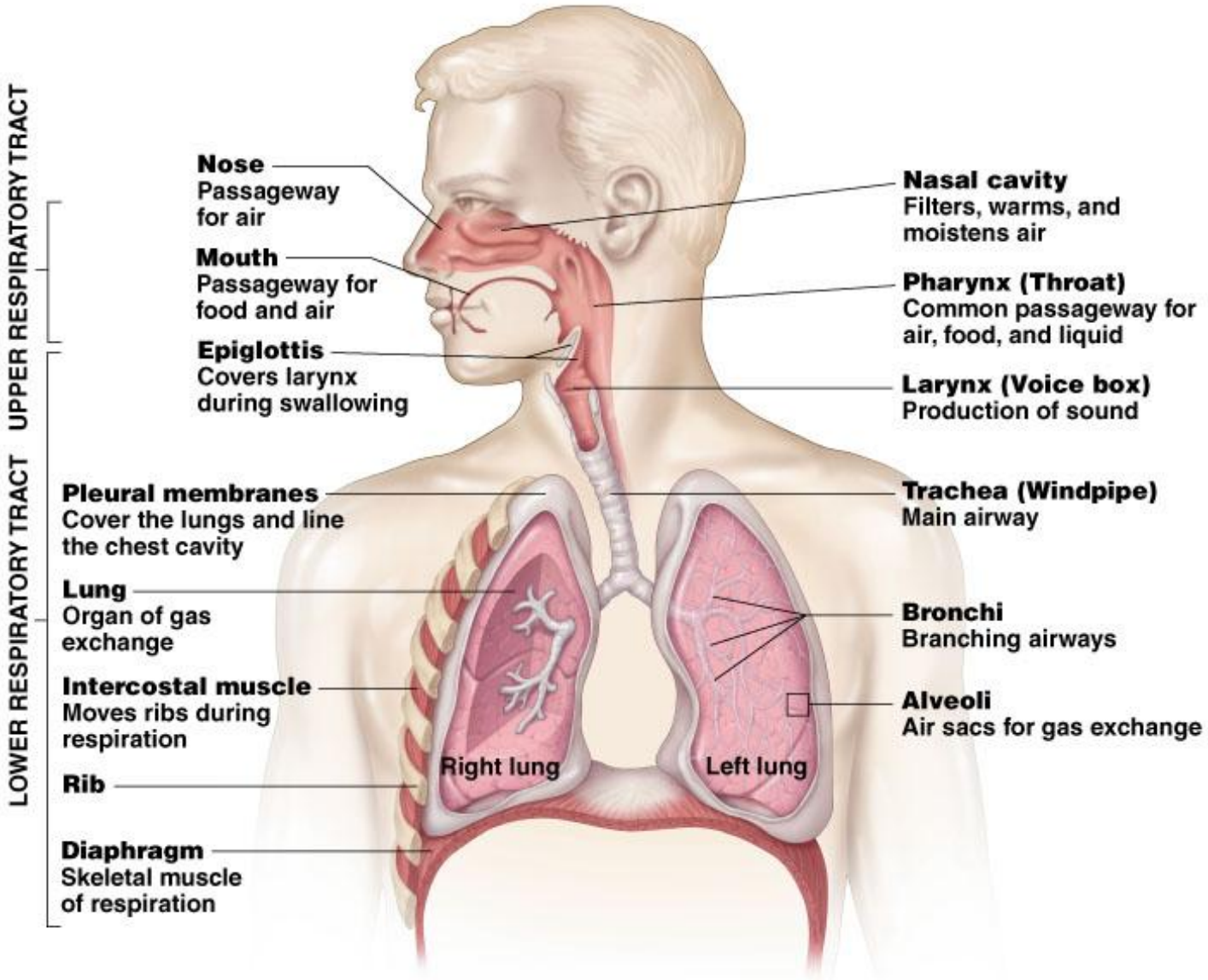


Figure 10.1

Organs in the Respiratory System

STRUCTURE	FUNCTION
nose / nasal cavity	warms, moistens, & filters air as it is inhaled
pharynx (throat)	passageway for air, leads to trachea
larynx	the voice box, where vocal chords are located
trachea (windpipe)	keeps the windpipe "open" trachea is lined with fine hairs called *cilia* which filter air before it reaches the lungs
bronchi	two branches at the end of the trachea, each lead to a lung
bronchioles	a network of smaller branches leading from the bronchi into the lung tissue & ultimately to air sacs
alveoli	the functional respiratory units in the lung where gases are exchanged

Components of the Upper Respiratory Tract

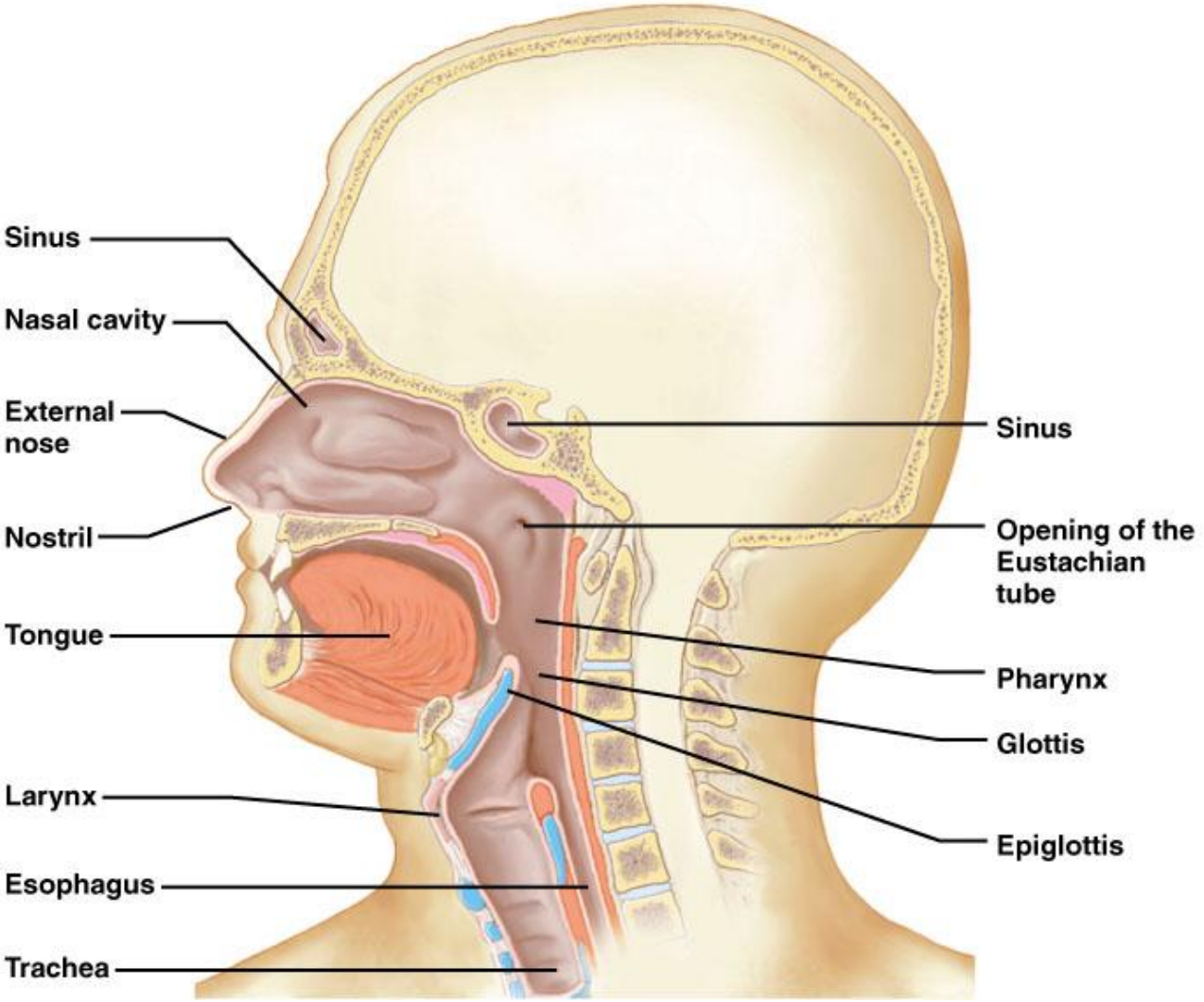
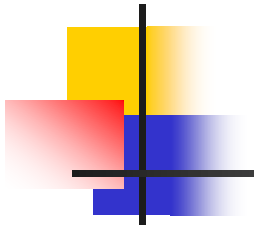


Figure 10.2

Upper Respiratory Tract Functions



- Passageway for respiration
- Receptors for smell
- Filters incoming air to filter larger foreign material
- Moistens and warms incoming air
- Resonating chambers for voice

Components of the Lower Respiratory Tract

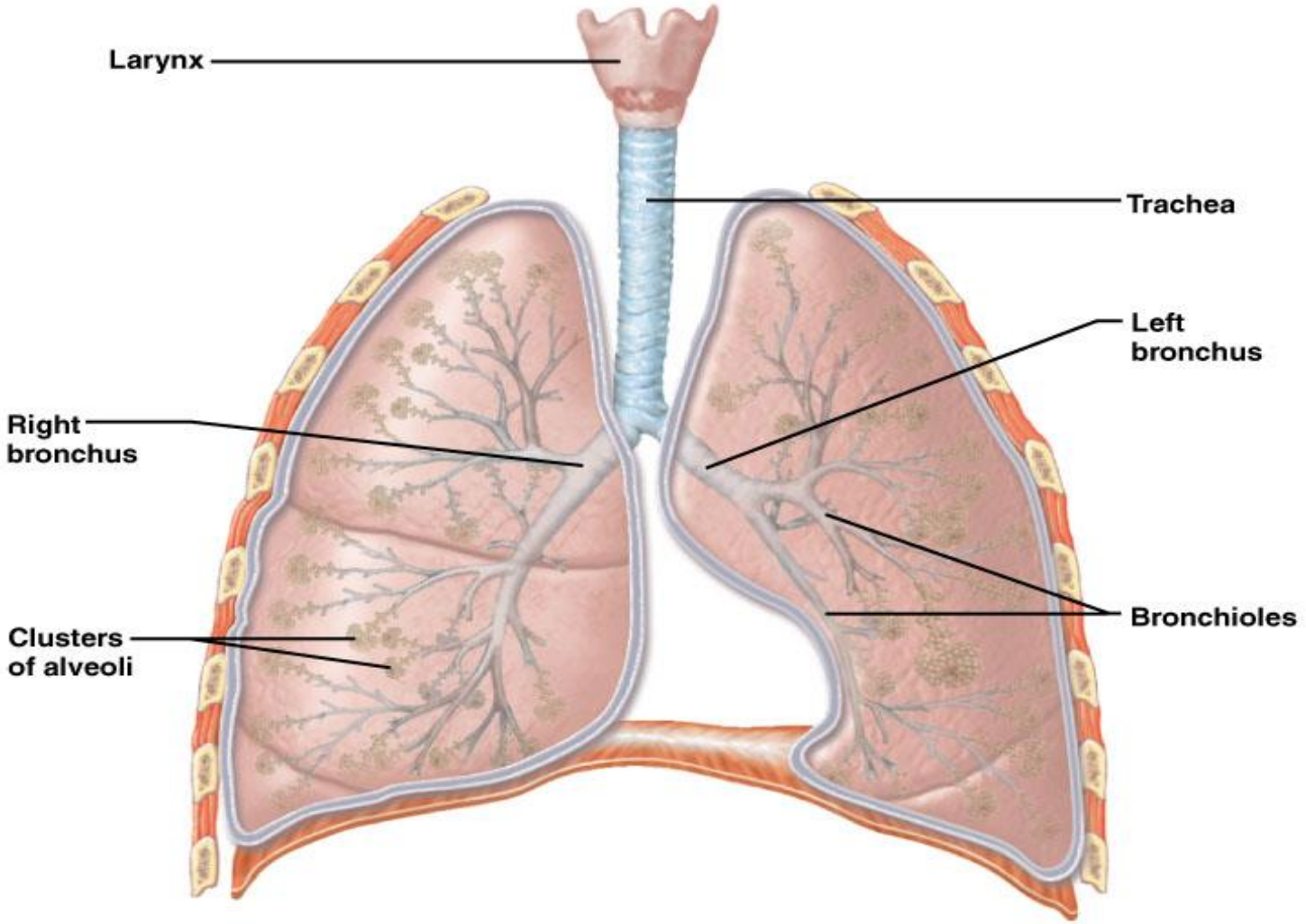
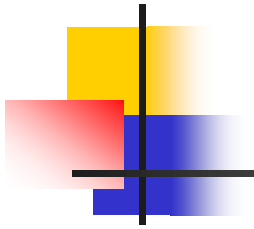


Figure 10.3

Lower Respiratory Tract



- Functions:
  - Larynx: maintains an open airway, routes food and air appropriately, assists in sound production
  - Trachea: transports air to and from lungs
  - Bronchi: branch into lungs
  - Lungs: transport air to alveoli for gas exchange

Gas Exchange Between the Blood and Alveoli

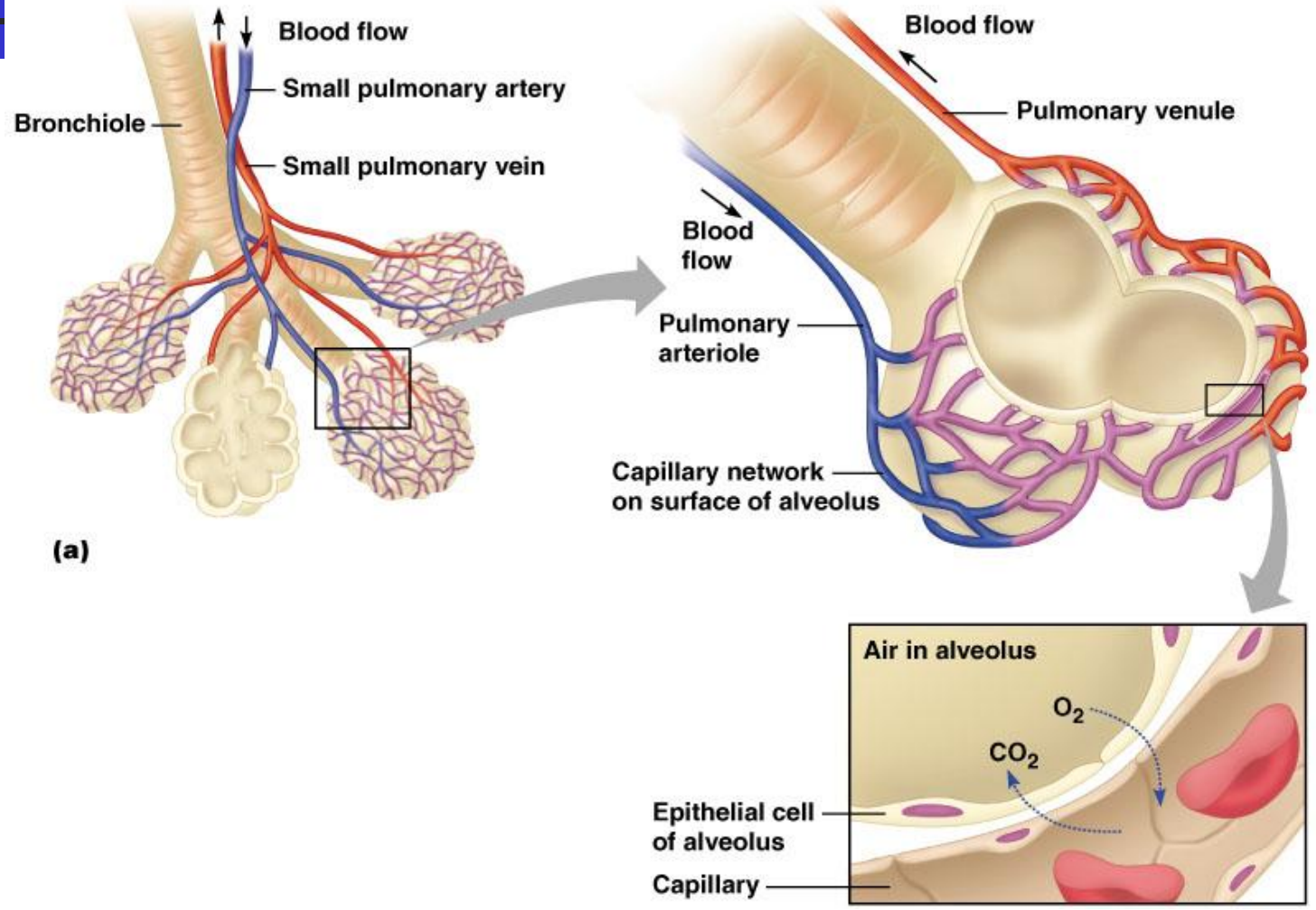
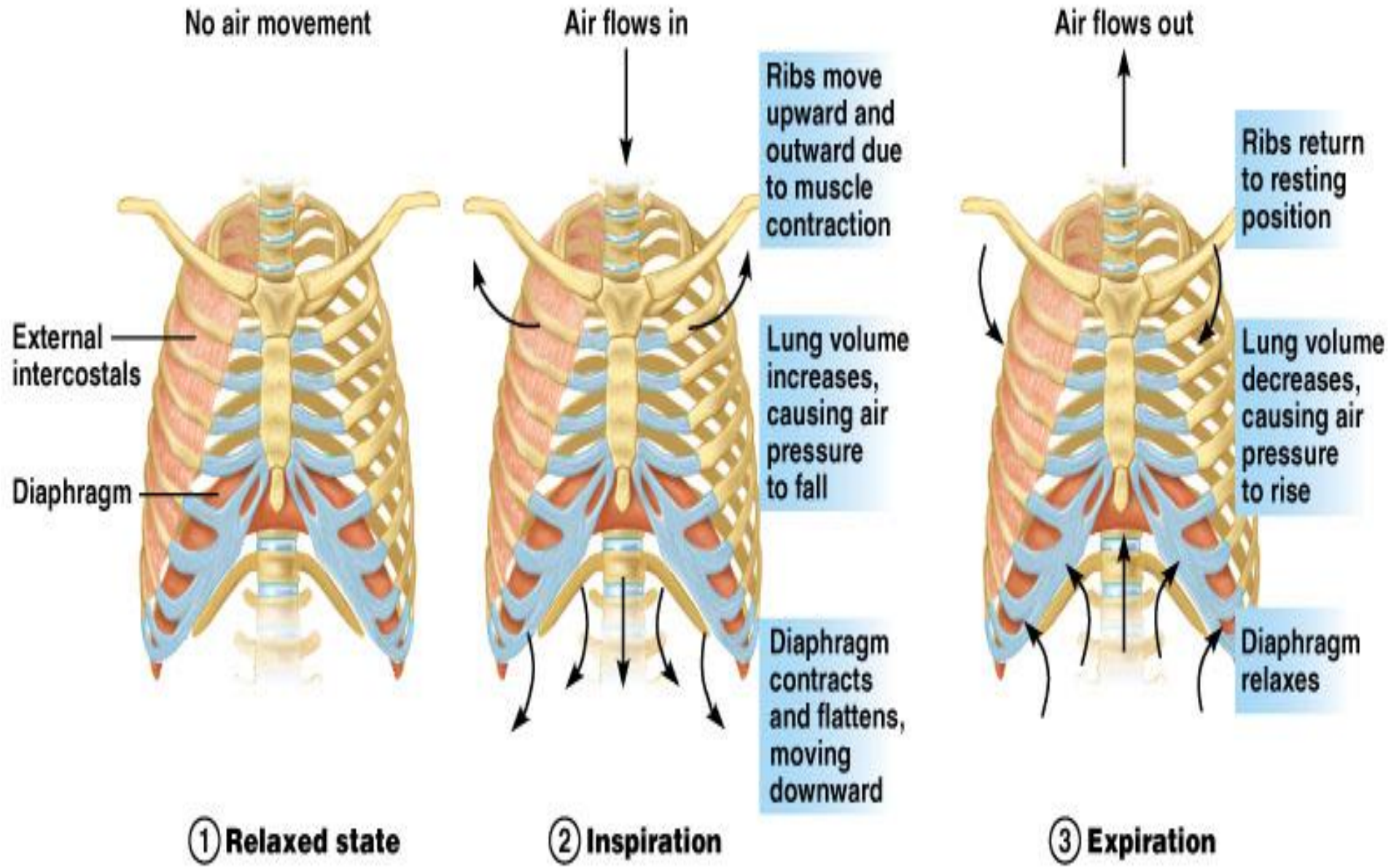
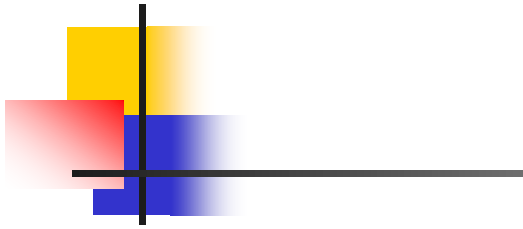


Figure 10.8A

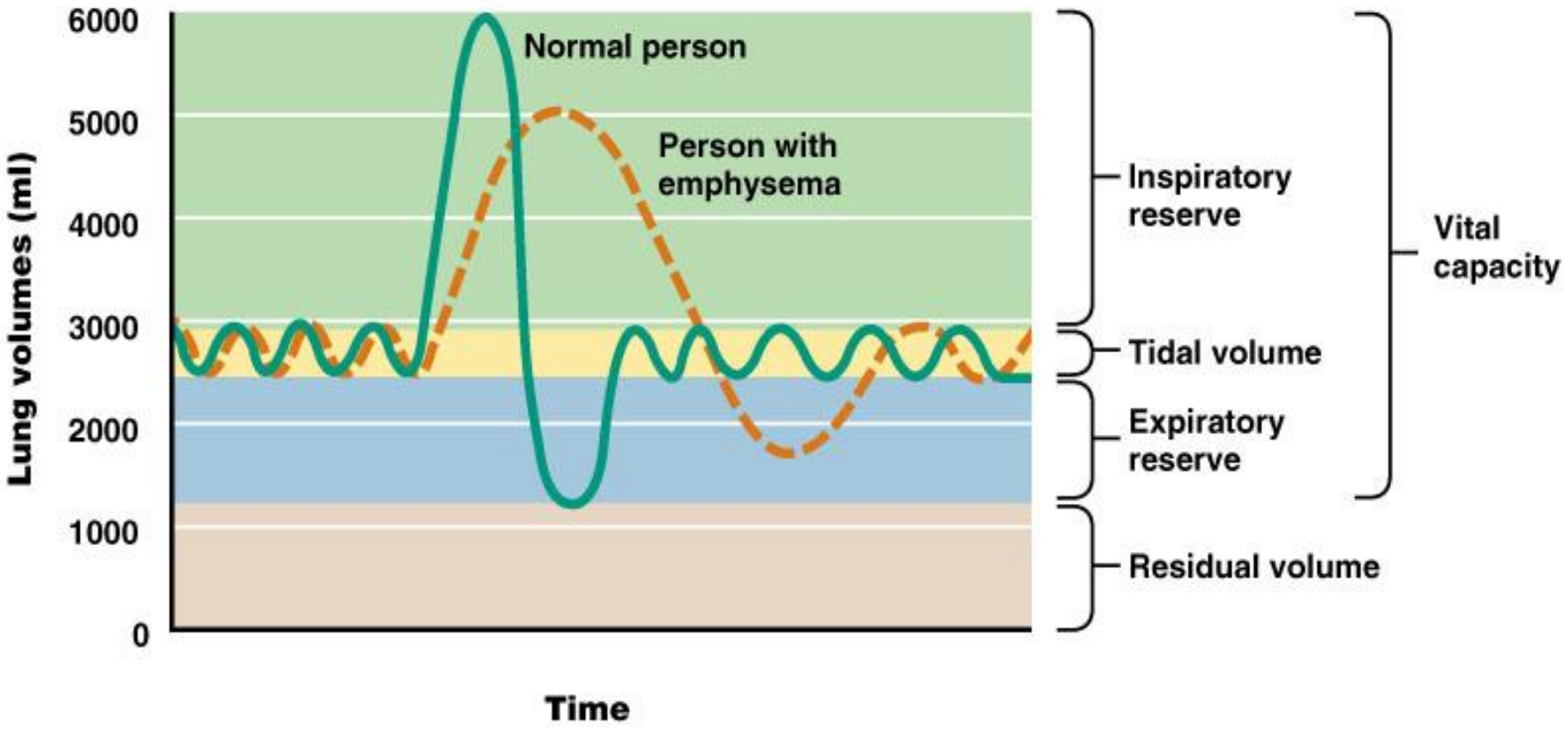
Respiratory Cycle





http://teachhealthk-12.uthscsa.edu/studentresources/AnatomyofBreathing3.swf

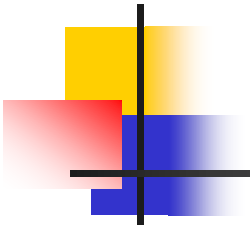
Measurement of Lung Capacity



(a)

Malfunctions & Diseases of the Respiratory System	
asthma	severe allergic reaction characterized by the constriction of bronchioles
bronchitis	inflammation of the lining of the bronchioles
emphysema	condition in which the alveoli deteriorate, causing the lungs to lose their elasticity
pneumonia	condition in which the alveoli become filled with fluid, preventing the exchange of gases
lung cancer	irregular & uncontrolled growth of tumors in the lung tissue

Four Respiration Processes



- Breathing (ventilation): air in to and out of lungs
- External respiration: gas exchange between air and blood
- Internal respiration: gas exchange between blood and tissues
- Cellular respiration: oxygen use to produce ATP, carbon dioxide as waste