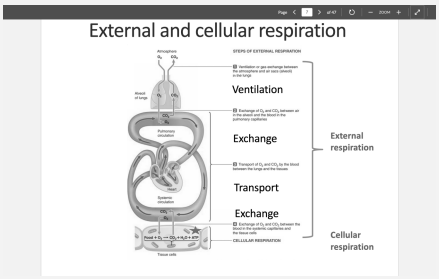
Terms:

Respiratory Airways:	carry air between atmosphere and alveoli
Nasal Passages:	nose
Pharynx:	passage for lungs and stomach
Larynx:	voice box
Trachea:	tube where air travels to lungs
Bronchi:	two main branches of trachea
Bronchioles:	small branches of respiratory airway
Alveoli:	small sacs where gas exchange occurs

System



4 Pressures in Ventilation

Atmospheric:	pressure exerted by the weight of gas in the atmosphere on objects on earth
Intra--alveolar:	pressure within alveoli
Intrapleural:	pressure within the pleural sac
Transmural:	pressure gradient across lung wall (intra-alveolar - intrapleural)

Conducting Zone

- Top of trachea all the way to respiratory bronchioles
- Provides low-resistance pathway for airflow
- Defends against microbes, toxic chemicals, and other foreign objects through mucus, cilia, and macrophages
- Warms and moistens the air
- Used in sound production (vocal cords)

Respiratory Zone

- Where gas exchange occurs
- Type 1 Cells: form walls of alveoli
- Type 2 Cells: secrete pulmonary surfactant to reduce surface tension
- Alveoli are the site of the gas exchange
- Alveolar surface is large as to allow rapid exchange of oxygen and carbon dioxide through diffusion

Lungs

- Consists of lower portion of respiratory airways, pulmonary circulation, and connective tissue
- Pleural sacs: thin fluid-filled sacs that enclose the lungs
- Pleura produce fluid that lubricates the lungs to prevent friction when breathing
- Pressure Gradient: air moves from area of high pressure to area of low pressure
- Respiratory pressures are always relative to atmospheric pressure
- High altitude = Low atmospheric pressure
- Low altitude = High atmospheric pressure
- Boyle's Law: at constant temperature the pressure of a gas varies inversely with its volume

During Inspiration

- Diaphragm contracts increasing thoracic cavity vertically
- External intercostal muscles contract elevating rib cage
- Intrapleural pressure becomes more subatmospheric
- Lungs expand
- Intra-alveolar pressure becomes subatmospheric
- Air flows into alveoli

During Expiration

- Diaphragm and intercostals stop contracting
- Chest wall recoils inward
- Intrapleural pressure moves back toward preinspiration value
- Lungs recoil toward preinspiration size
- Air in alveoli becomes compressed
- Intra-alveolar pressure becomes greater than atmospheric pressure
- Air flows out of lungs

Gas Exchange

Gas exchange:	- continuous exchange of O2 and CO between environment and body2
	- movement of gases occurs by passive diffusion down partial pressure gradient
	- diffuse from area of high partial pressure to areas of low partial pressure
Partial Pressures:	- independent pressure exerted by a particular gas
	- directly proportional to percentage of gas in that total mixture