# mechanism of ventilation

negative pressure breathing

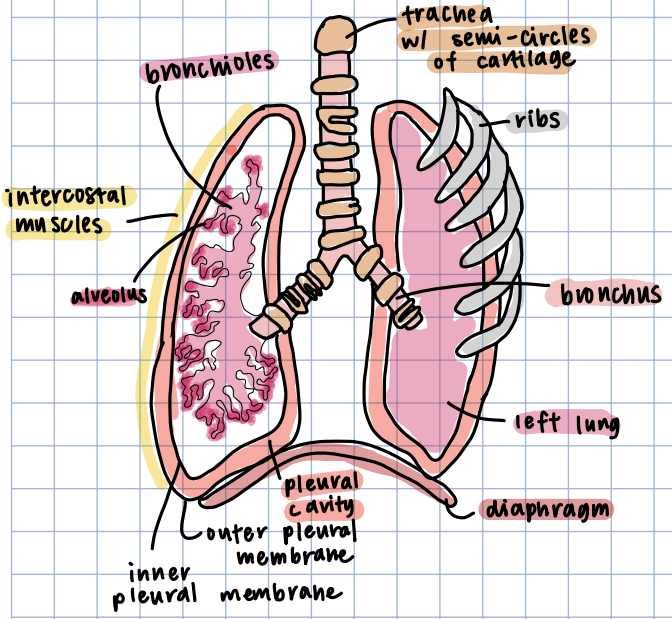
**breathing in / inspiration / inhalation**

external intercostal muscles contract
internal intercostal muscles relax
moves ribcage up and out
diaphragm flattens + contracts
↳ increase volume of the thorax
decrease pressure inside thorax < atm
↳ air is drawn in

**breathing out / expiration / exhalation**

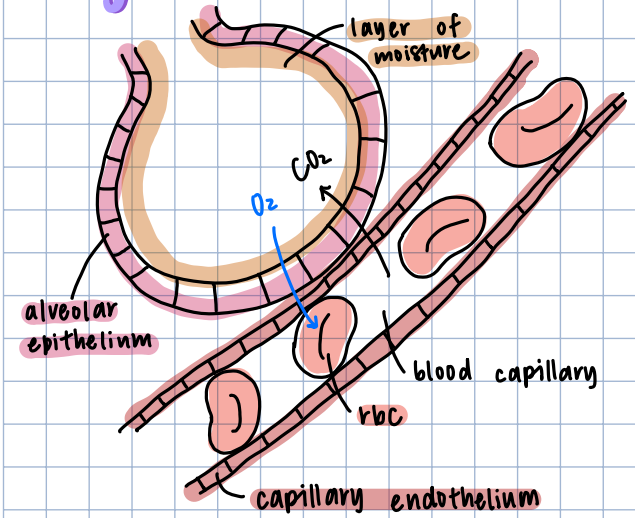
internal intercostal muscles contract
external intercostal muscles relax
moves ribcage down and in
diaphragm relaxes
↳ decrease volume of the thorax
increase pressure inside thorax > atm
↳ air is pushed out

# the human breathing system




- lungs are enclosed in the thorax
  ↳ airtight compartment
- pleural membranes surround each lung + line thorax
  pleural cavity contains pleural fluid
  ↳ lubricant, prevent friction during ventilation
- **diaphragm** : dome shape muscle
  separates thorax from the abdomen
- ribs surround thorax
- intercostal muscle btween ribs
- **trachea** : flexible airway
- **bronchi** : branches of the trachea
- **bronchiole** : branches of bronchi
- **alveoli** : air sacs at the end of bronchiole

# gas exchange across alveoli




- human lungs contain ≒ 600 mill alveoli w/ combined total SA of 70 $m^2$
- the alveolar wall is one cell thick
- $O_2$ diffuses alveolar epithelium → blood

the conc. gradient of $O_2$ is maintained :

- ventilation : maintains high conc. of $O_2$ in the alveoli
- flow of blood through dense capillary network around the alveoli oxygenated blood → deoxygenated blood