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# COMPARATIVE ANATOMY OF RESPIRATORY SYSTEM IN VERTEBRATES

BY

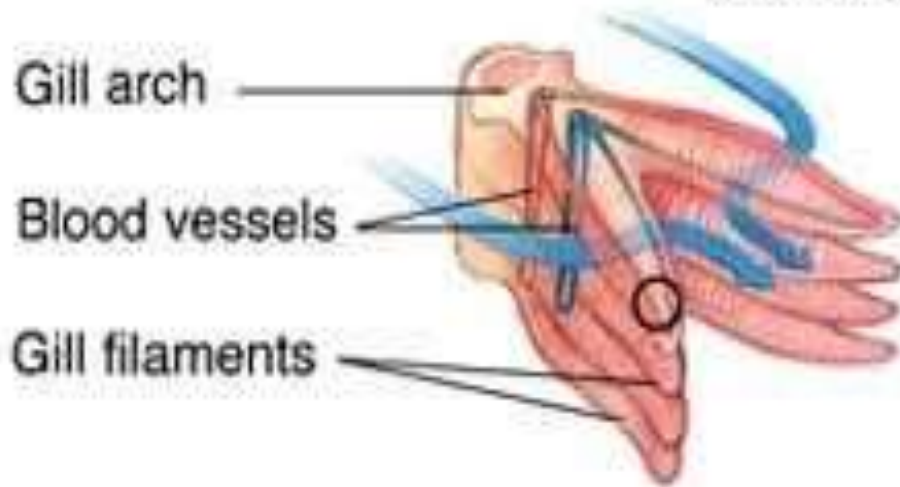
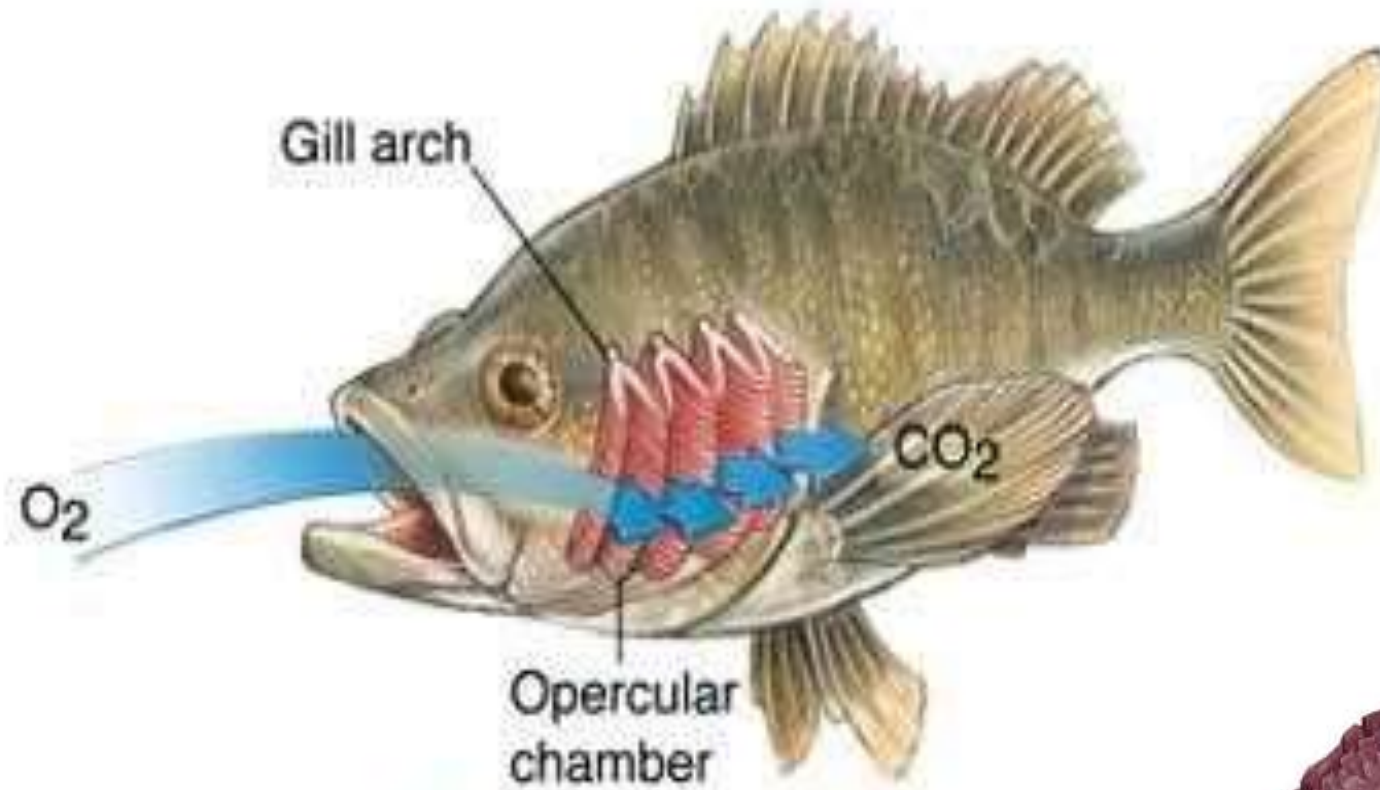
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# Respiration in Fish

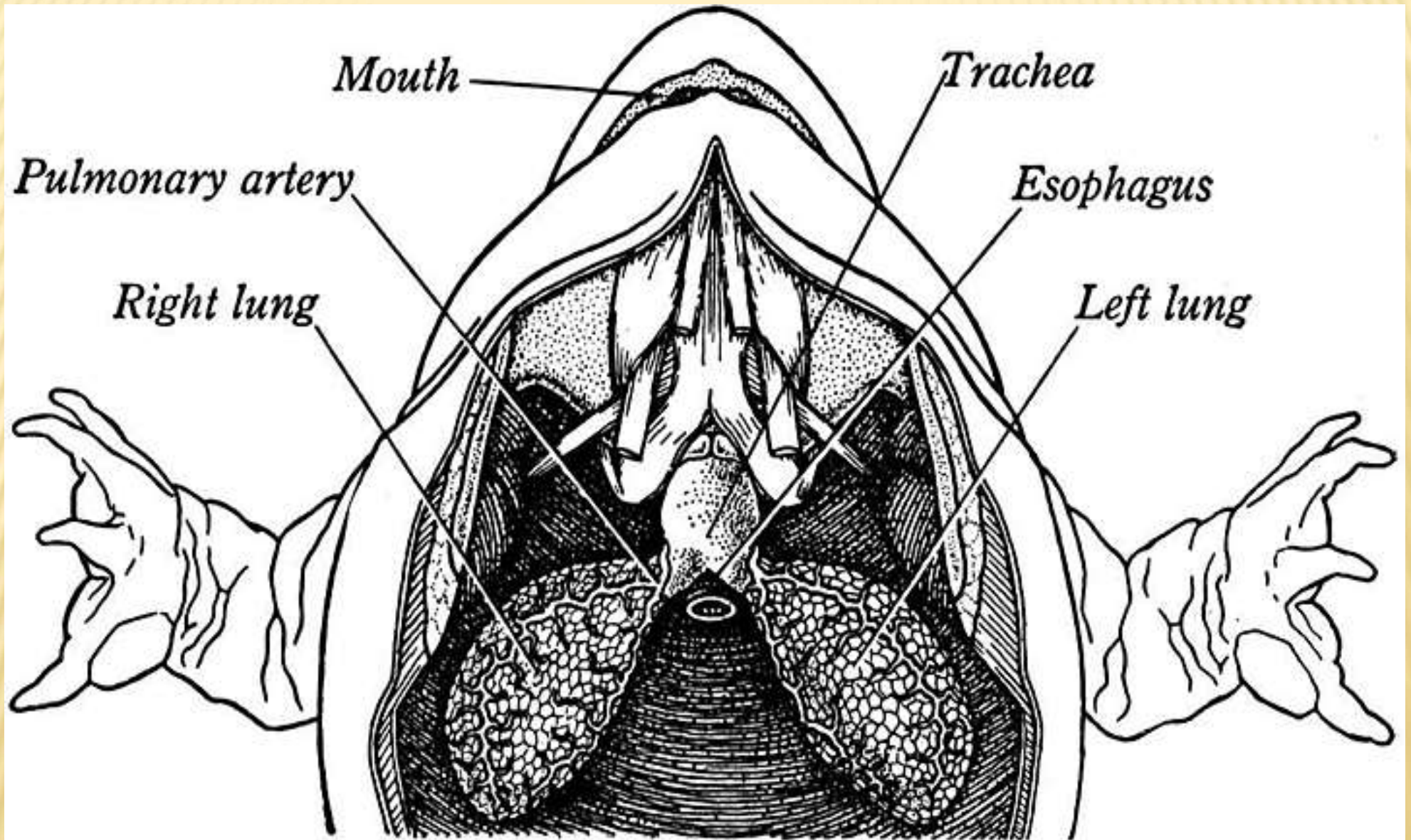
- Gills are respiratory organ found in many aquatic organisms that extracts dissolved oxygen from water and excretes carbon dioxide.
- Gills usually consist of thin filaments of tissue, branches, or slender, tufted processes that have a highly folded surface to increase surface area.
- A high surface area is crucial to the gas exchange of aquatic organisms, as water contains only a small fraction of the dissolved oxygen that air does.





# Respiration in Amphibians

- **Cutaneous Respiration:** **(Frog)** In addition to inhaling and exhaling air through their lungs, many amphibians rely on cutaneous respiration, where gas exchange occurs through the skin.
- In order for cutaneous respiration to be efficient, the skin must remain moist.



*Lungs of Frog*



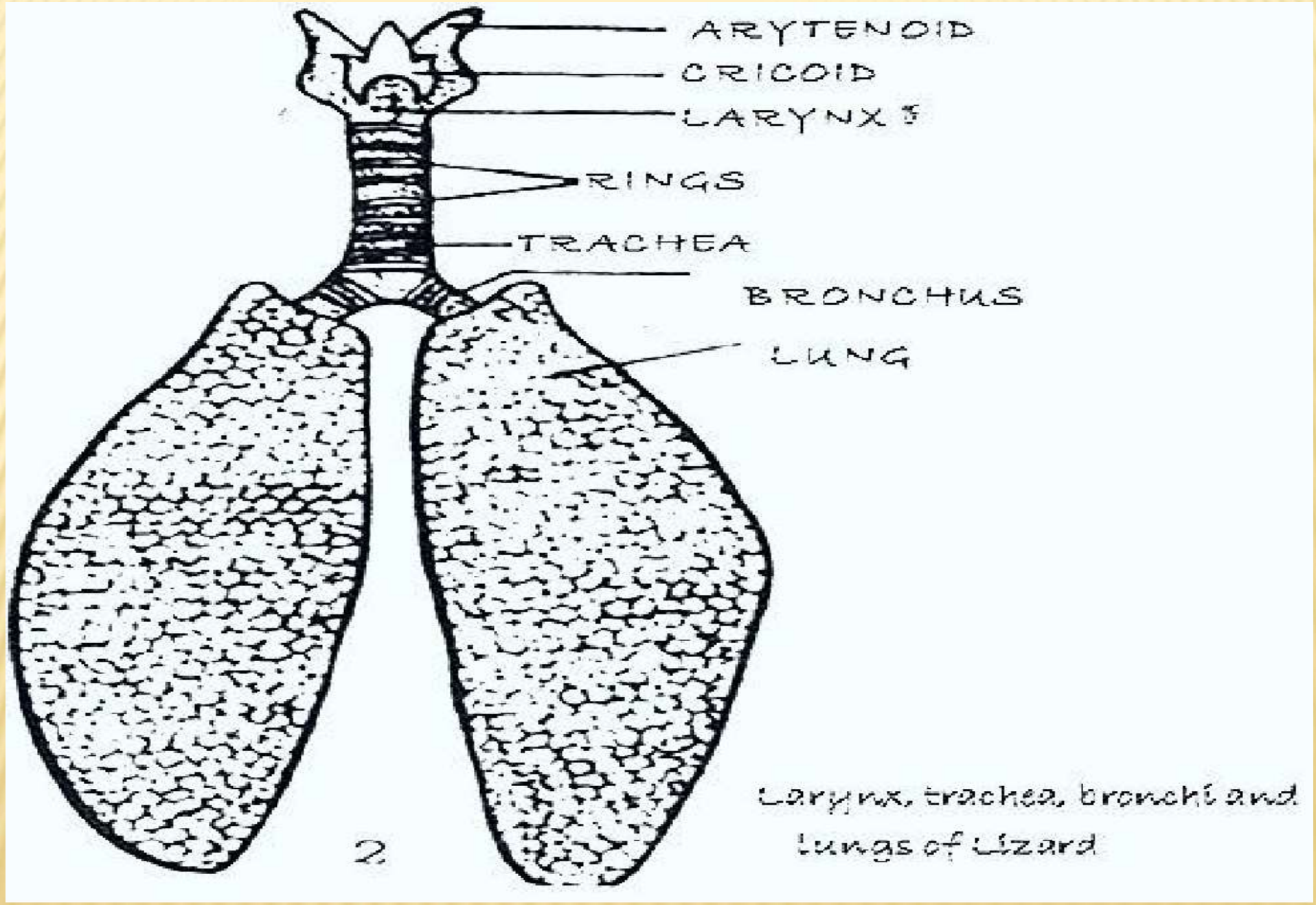
# Respiration in Reptiles

- All reptiles breathe using lungs. (**Lizard**)
- Lung ventilation is accomplished differently in each main reptile group.
- In squamates (scaled reptiles-the largest group), the lungs are ventilated almost exclusively by the axial musculature.



# Respiration in Reptiles

- This is also the **(Lizard)** same musculature that is used during locomotion. Because of this constraint, most squamates are forced to hold their breath during intense runs.
- Other reptiles have other adaptations for breathing (for example, crocodiles use a diaphragm that is analogous to the diaphragm in humans while turtles and tortices use other muscles to allow breathing with a rigid shell).







# Respiration in

- **Air Sacs:-** When birds inhale, the air first travels to the posterior air sacs.
- Next, it travels to the lungs through a series of breathing tubes.
- Stale air travels to the anterior air sacs, which is then exhaled.

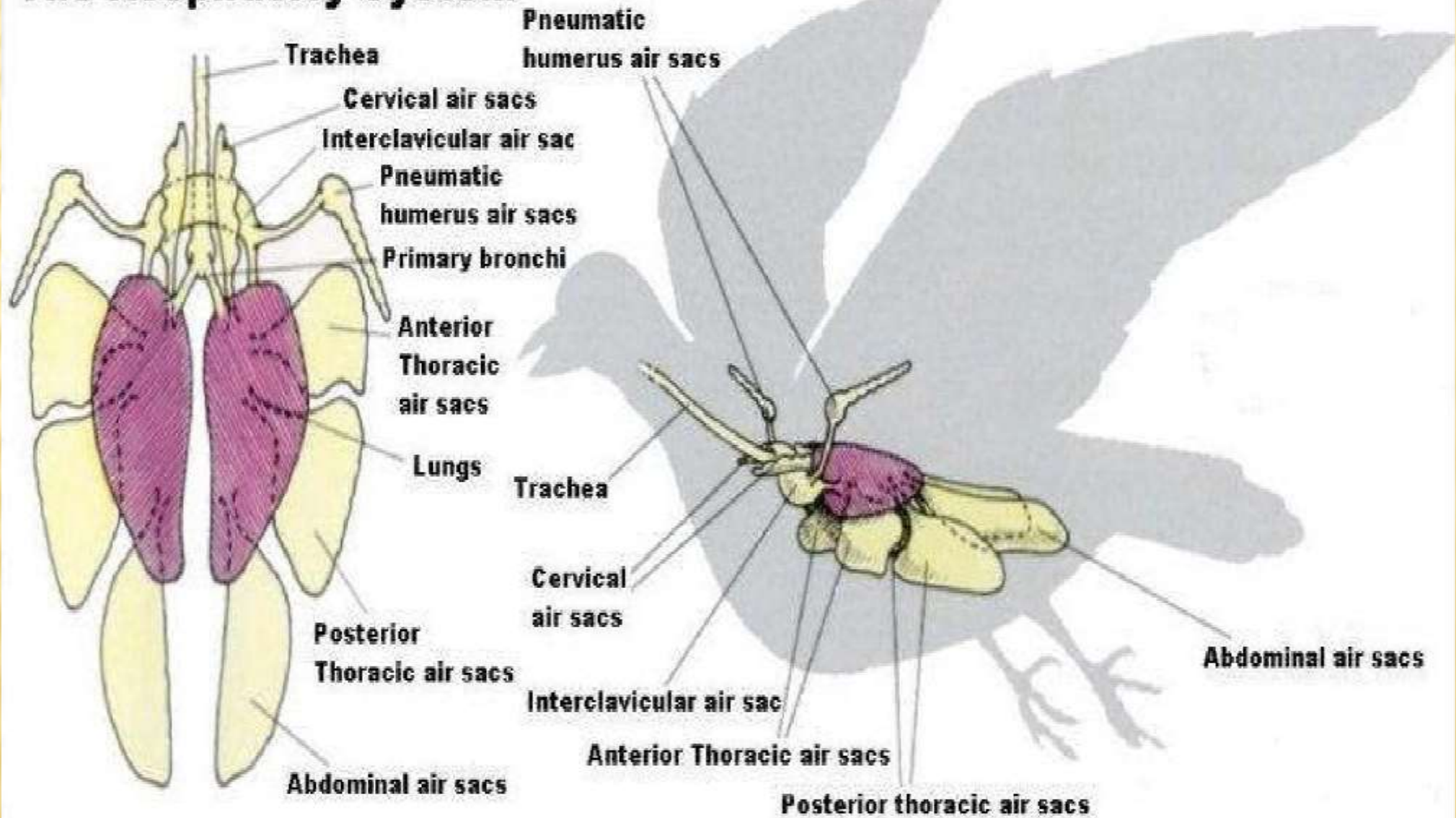


# Respiration in

## Birds

- This system of air sacs and breathing tubes allows air to flow through the lungs in a single direction enable birds to remove oxygen from the air when they inhale AND when they exhale.
- This is different from most vertebrates that have air traveling through the lungs in two directions (in and out). This system is highly efficient and enables birds to maintain a high metabolic rate.

# The Respiratory System





# Respiration in

- Mammals inhale by contracting the diaphragm, which increased the size of the chest cavity causing air to rush into the lungs.
- There, the air enters the alveoli.
- This creates a high concentration of oxygen in the alveoli, the oxygen will diffuse into the blood stream through the capillaries.

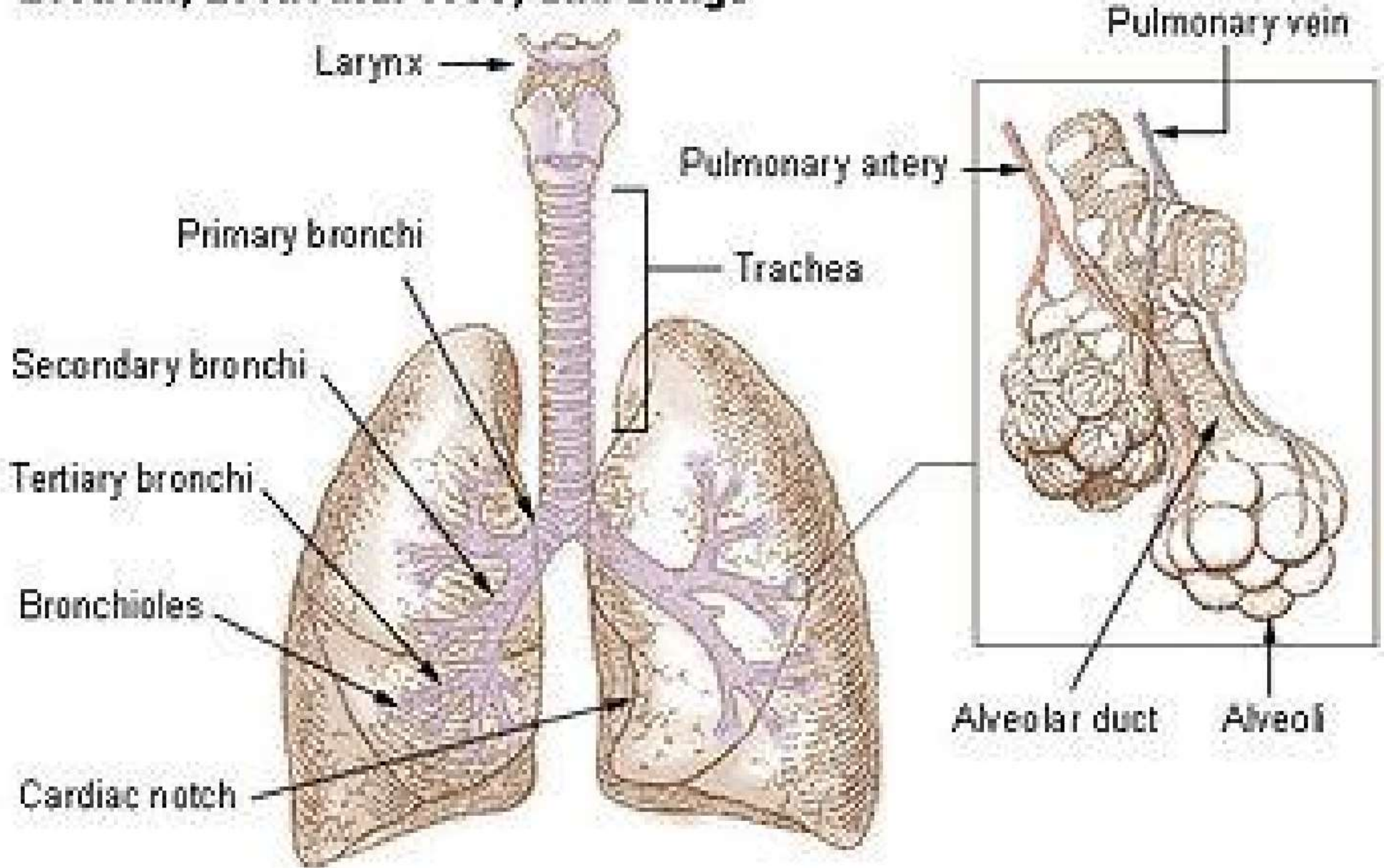


# Respiration in

## Mammals

- Inside the blood there is a high concentration of carbon dioxide, so the carbon dioxide diffuses into the alveoli.
- The diaphragm then relaxes and the pressure forces the air out the lungs.

## Bronchi, Bronchial Tree, and Lungs





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**THANK  
YOU**