

respiratory system 2

Amphibians



salamander



tree frog



common toad

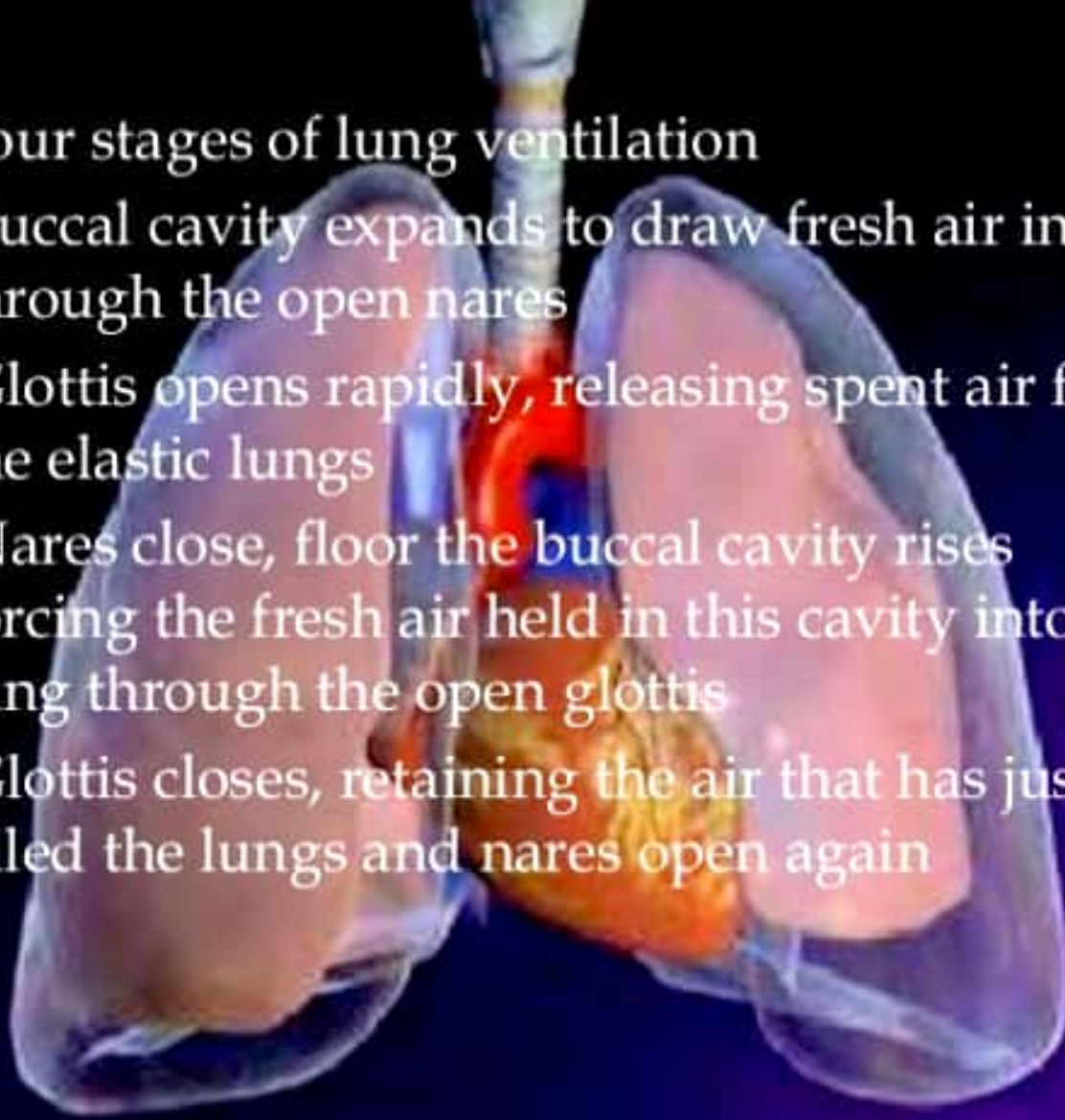


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▣ AMPHIBIANS

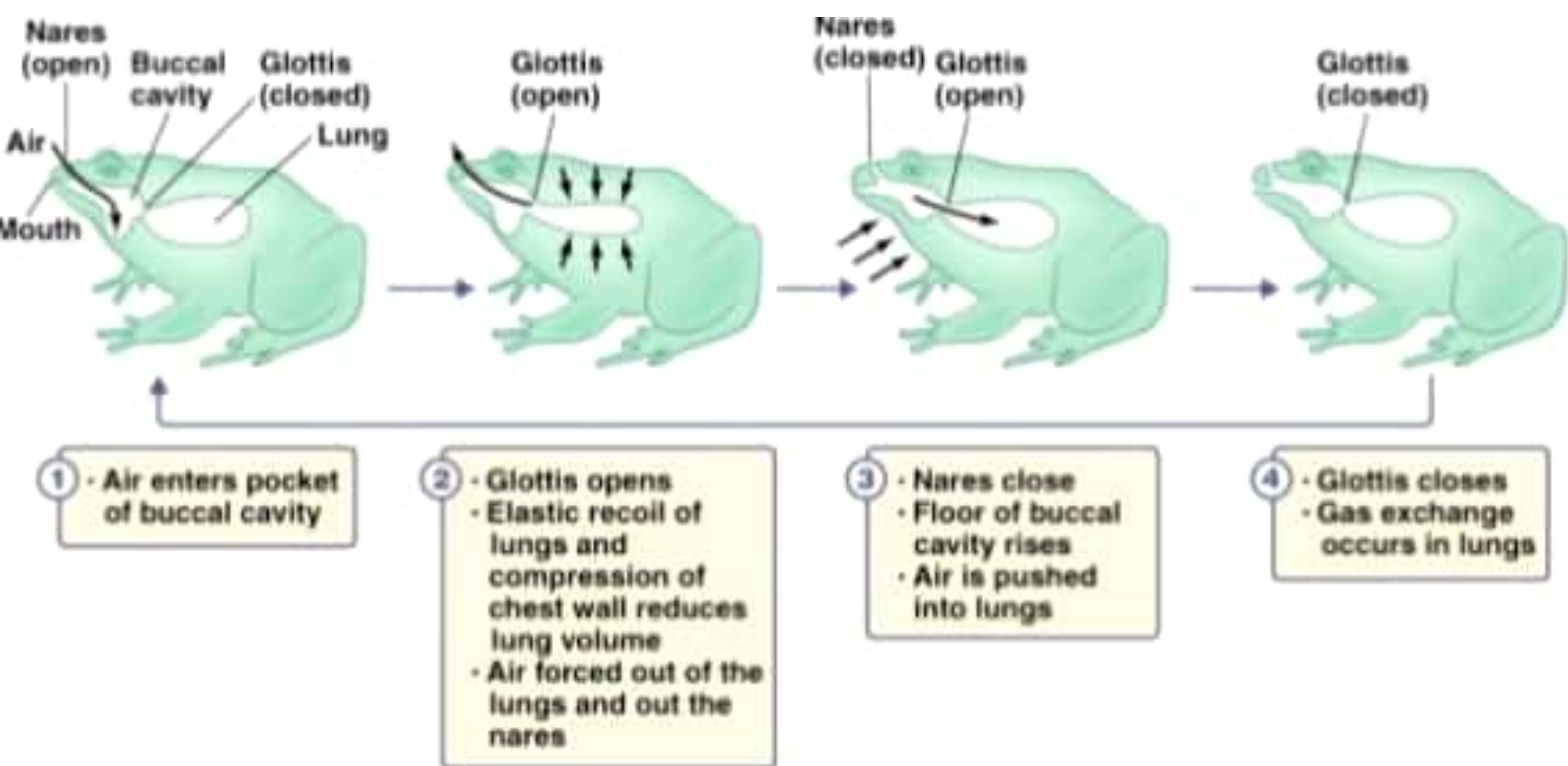
- ❖ They are cold blooded, meaning they don't need much oxygen
- ❖ 2 simple sacs
- ❖ Lungs
- ❖ - don't have diaphragms and they force air into their lungs by moving their mouth (like swallowing) → Buccal pumping





▣ Four stages of lung ventilation

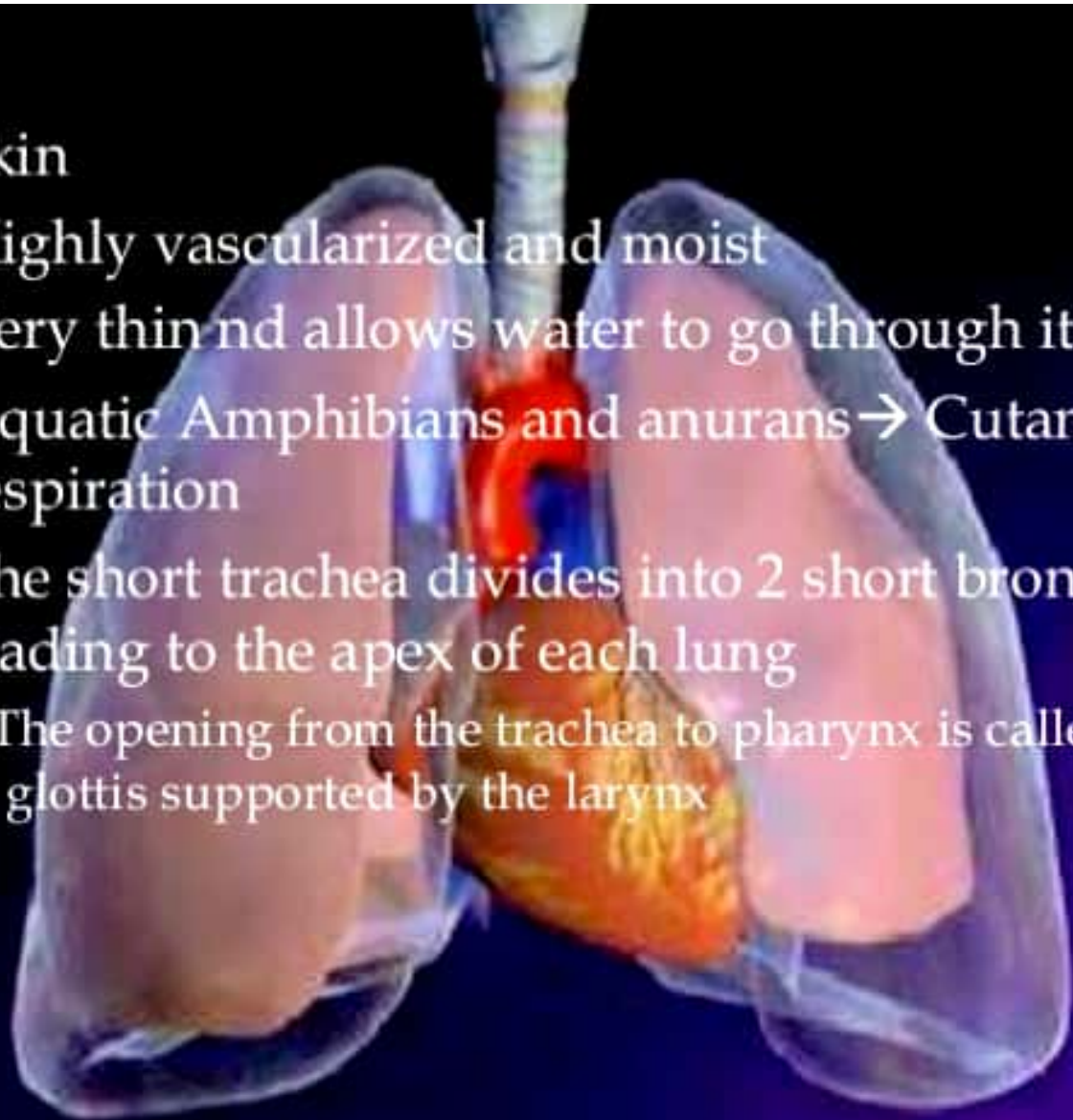
- 1.) Buccal cavity expands to draw fresh air in through the open nares
- 2.) Glottis opens rapidly, releasing spent air from the elastic lungs
- 3.) (Nares close, floor the buccal cavity rises forcing the fresh air held in this cavity into the lung through the open glottis
- 4.) Glottis closes, retaining the air that has just filled the lungs and nares open again



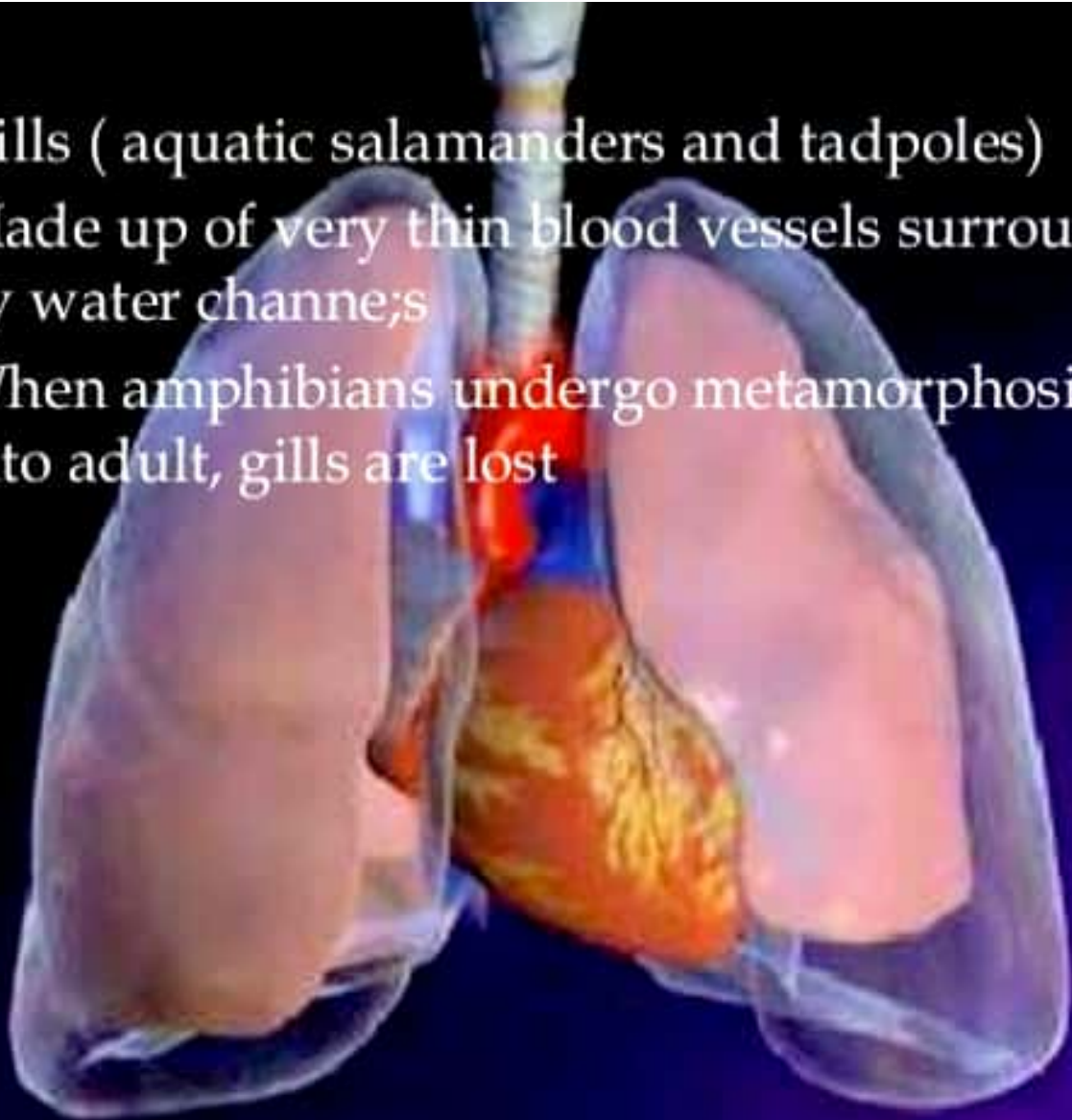
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▣ Skin

- Highly vascularized and moist
- Very thin and allows water to go through it
- Aquatic Amphibians and anurans → Cutaneous respiration
- The short trachea divides into 2 short bronchi leading to the apex of each lung
 - The opening from the trachea to pharynx is called the glottis supported by the larynx



- ▣ Gills (aquatic salamanders and tadpoles)
- Made up of very thin blood vessels surrounded by water channels;
- When amphibians undergo metamorphosis into adult, gills are lost

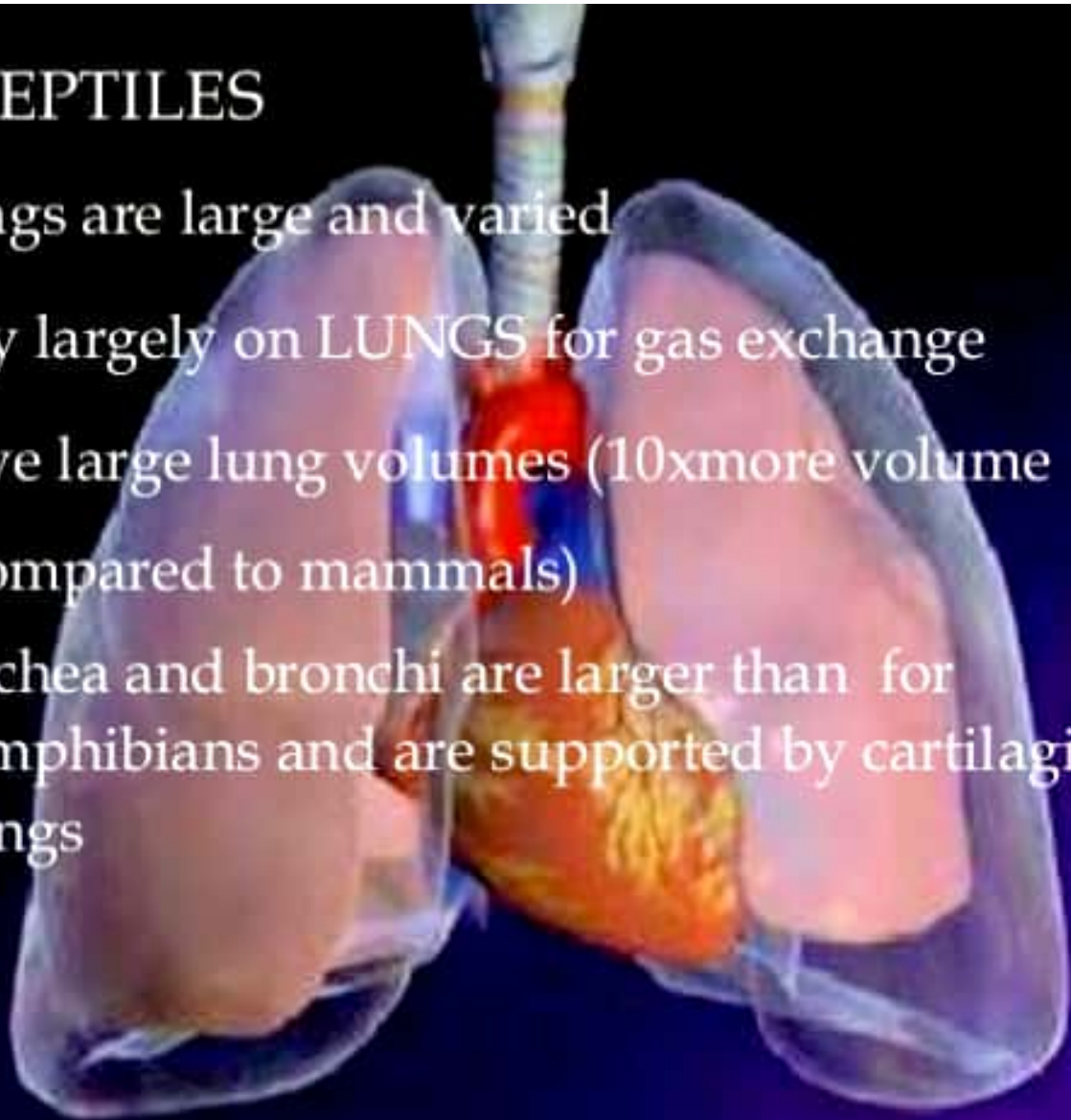



Reptiles



▣ REPTILES

- Lungs are large and varied
- Rely largely on LUNGS for gas exchange
- Have large lung volumes (10x more volume compared to mammals)
- Trachea and bronchi are larger than for amphibians and are supported by cartilaginous rings



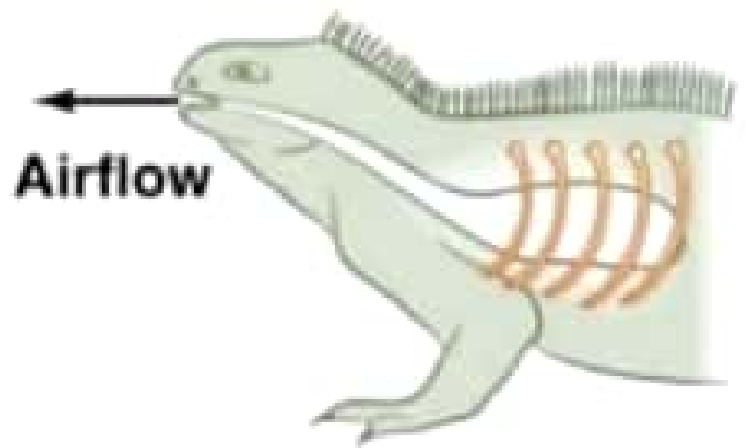
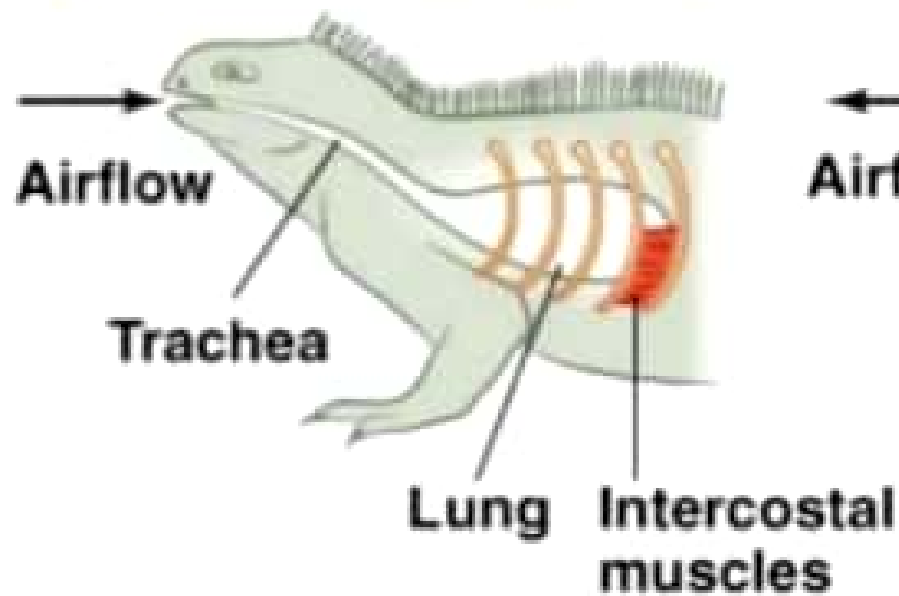
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- Supplemental cutaneous respiration is significant, but for the most part, paired lungs meet their respiratory needs
 - Filling of the lungs in all the reptiles is based on an aspiration pump
 - Exhalation of passive

CROCODALIANS

- Use diaphragm muscle for lung ventilation

Inhalation: ribs move forward and outward, thorax expands

Exhalation: ribs move backward and inward, thorax compresses



(a) Lung ventilation in lizards

An anatomical illustration of a vertebrate respiratory system. It shows a central trachea (windpipe) in light blue, branching into two lungs. The lungs are depicted in a pinkish-red color. In the center, between the lungs, is a heart-like structure shown in orange and red. The entire system is set against a dark blue background.

-Contraction of the diaphragmatic muscles draws the liver back, increasing the volume of the lung cavity and dropping pressure within the lungs

- In caimans and other crocodiles, ribs rotate forward and outward, expanding the cavity around the lungs during inhalation

SQUAMATES (Snakes and Lizards)

-Don't have diaphragm muscles for lung ventilation

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- The muscles used for locomotion are the same used for their respiratory systems
 - Contracting and flexing body muscles move their ribs and lungs

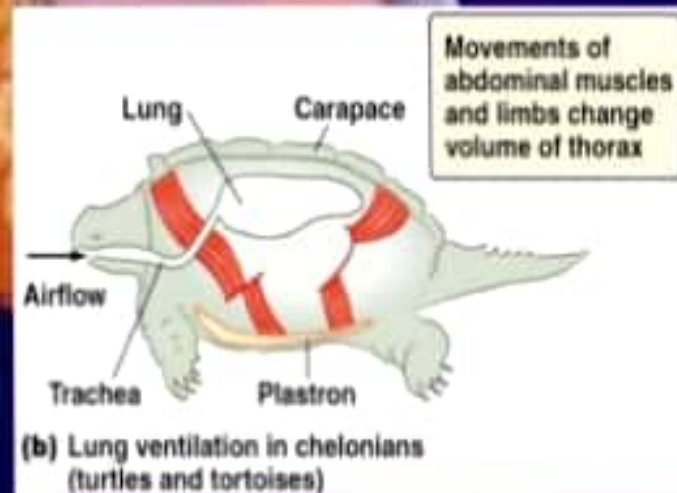
In most snakes, there are usually two regions of the lung:

1. Anterior respiratory portion or faveoli
2. Posterior saccular portion or avascular

-Submergence in water- have large lungs for large amount of oxygen for long dives
(Hydrophinae and Arochordidae)

TESTUDINES (Turtles)

- Having shells makes lung expansion more difficult
- Must use their limbs for lung ventilation → expels air from the lungs and pushing their limbs out of their shells expands the lungs
- Have complex lungs w/ large surface areas and volumes



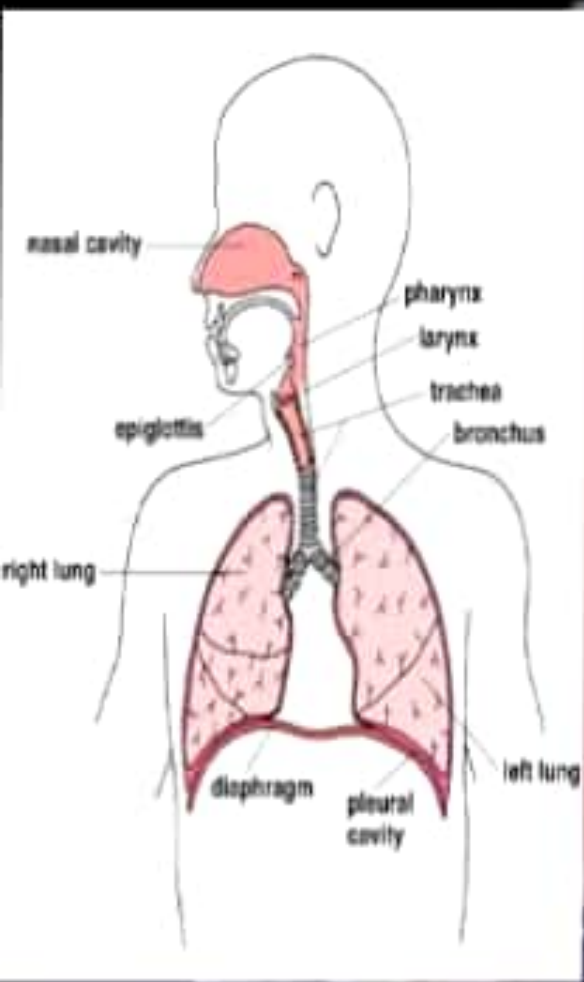
Mammals



▣ 4.) Mammals

- The chief organ in mammalian respiration is the lungs (located in the pleural cavities in the thorax)
- More finely, homogenously divided and more efficient
- Aspiration pumps ventilates the lungs of mammals
- Breathing is dependent to the rib muscles and diaphragm

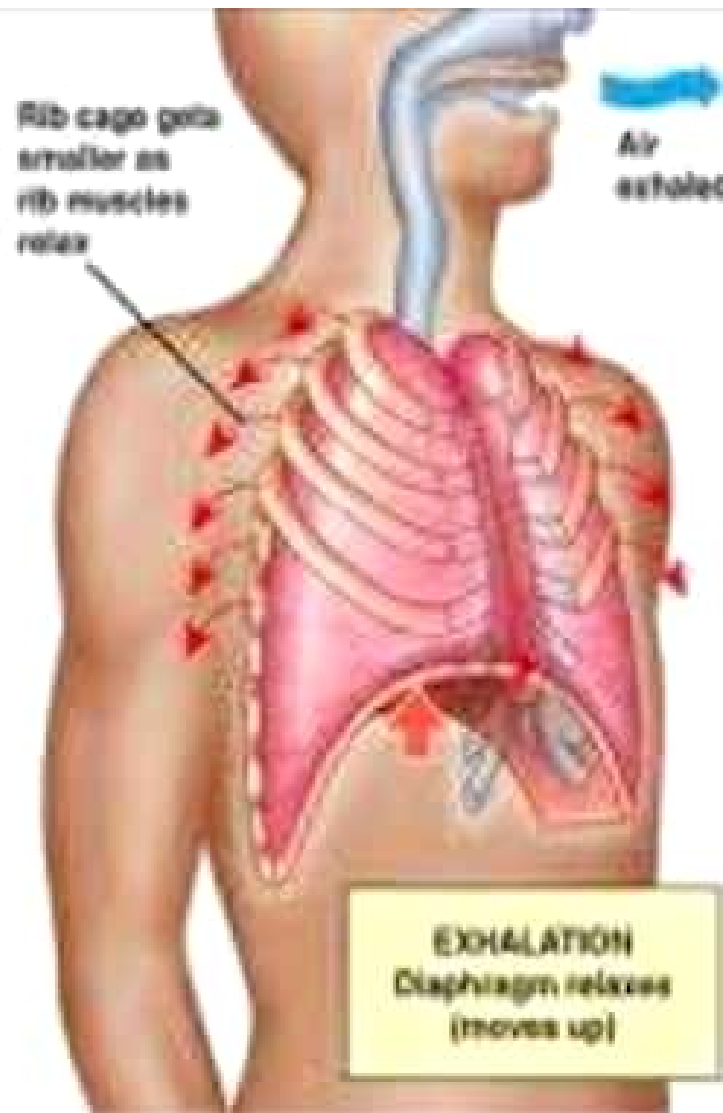
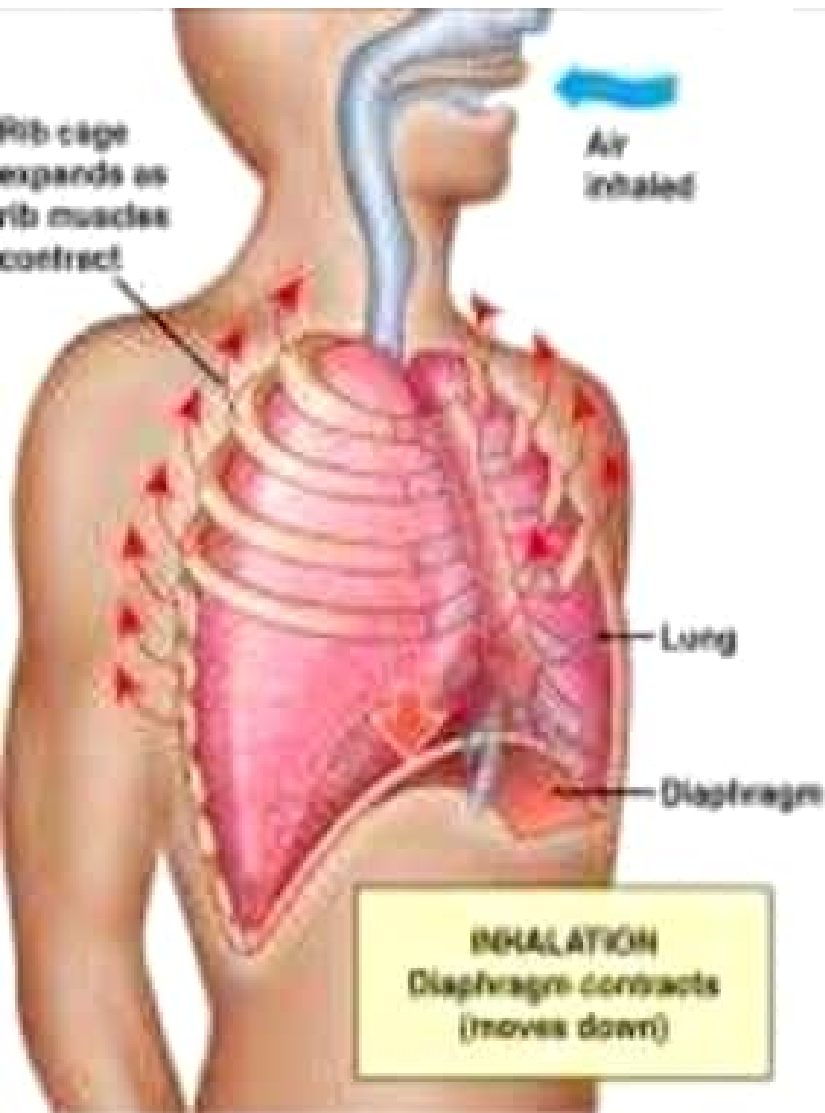






□ SUCTION-PUMP MECAHNISM OF INHALATION AND EXHALATION

- ❖ inhalation → when the rib cage opens up and the diaphragm flattens and moves downward; air rush inside
- ❖ lungs expands → decrease in air pressure
- ❖ exhalation → the diaphragm and rib muscles relax to their neutral state that causes the lungs to contract; air flow out
- ❖ squashing of lungs → increase in air pressure



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- ▣ The trachea, bronchi and bronchioles that transport gas to and from the alveoli is called the respiratory tree
 - ▣ No gas exchange occurs along the conducting passageway of the respiratory tree until air reaches the alveoli
 - Epiglottis
 - Glottis