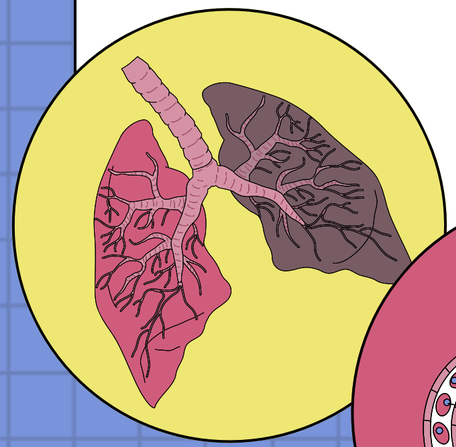
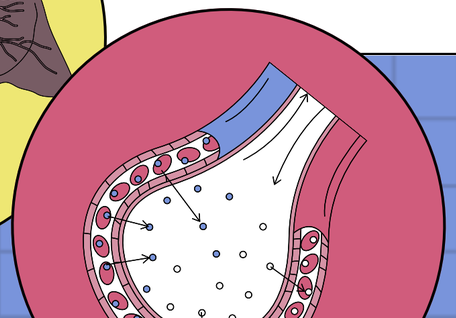
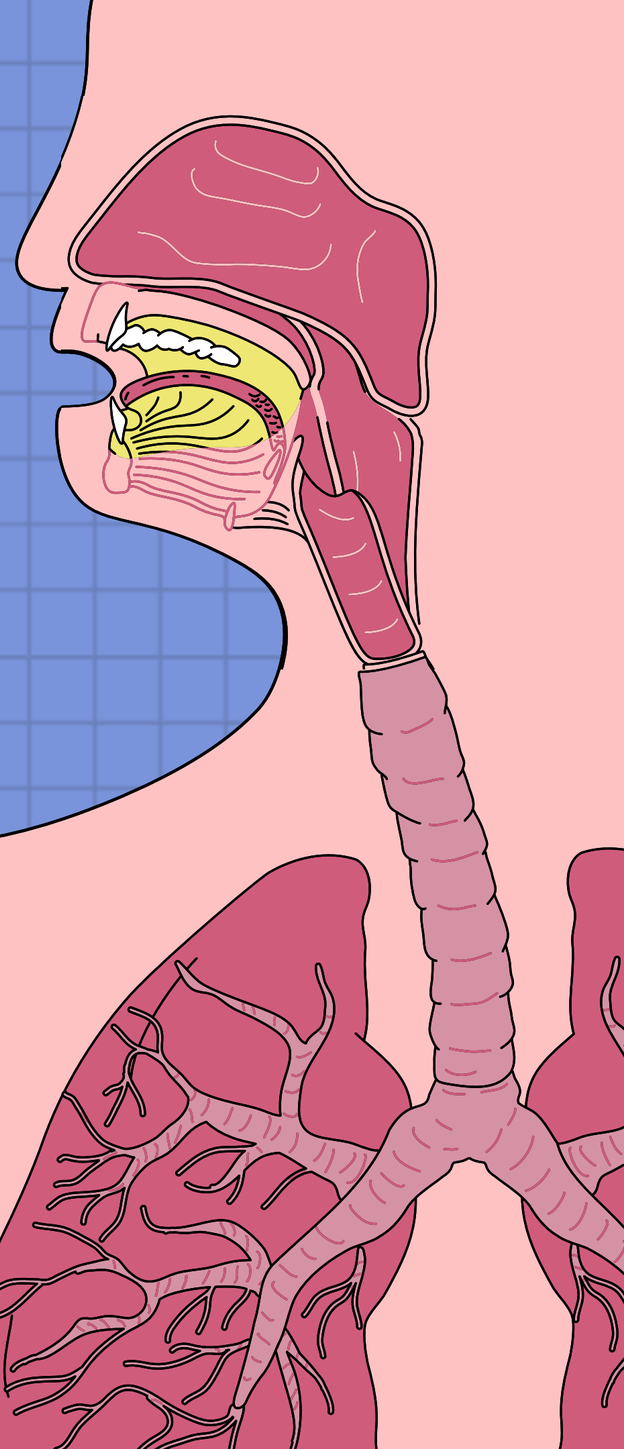
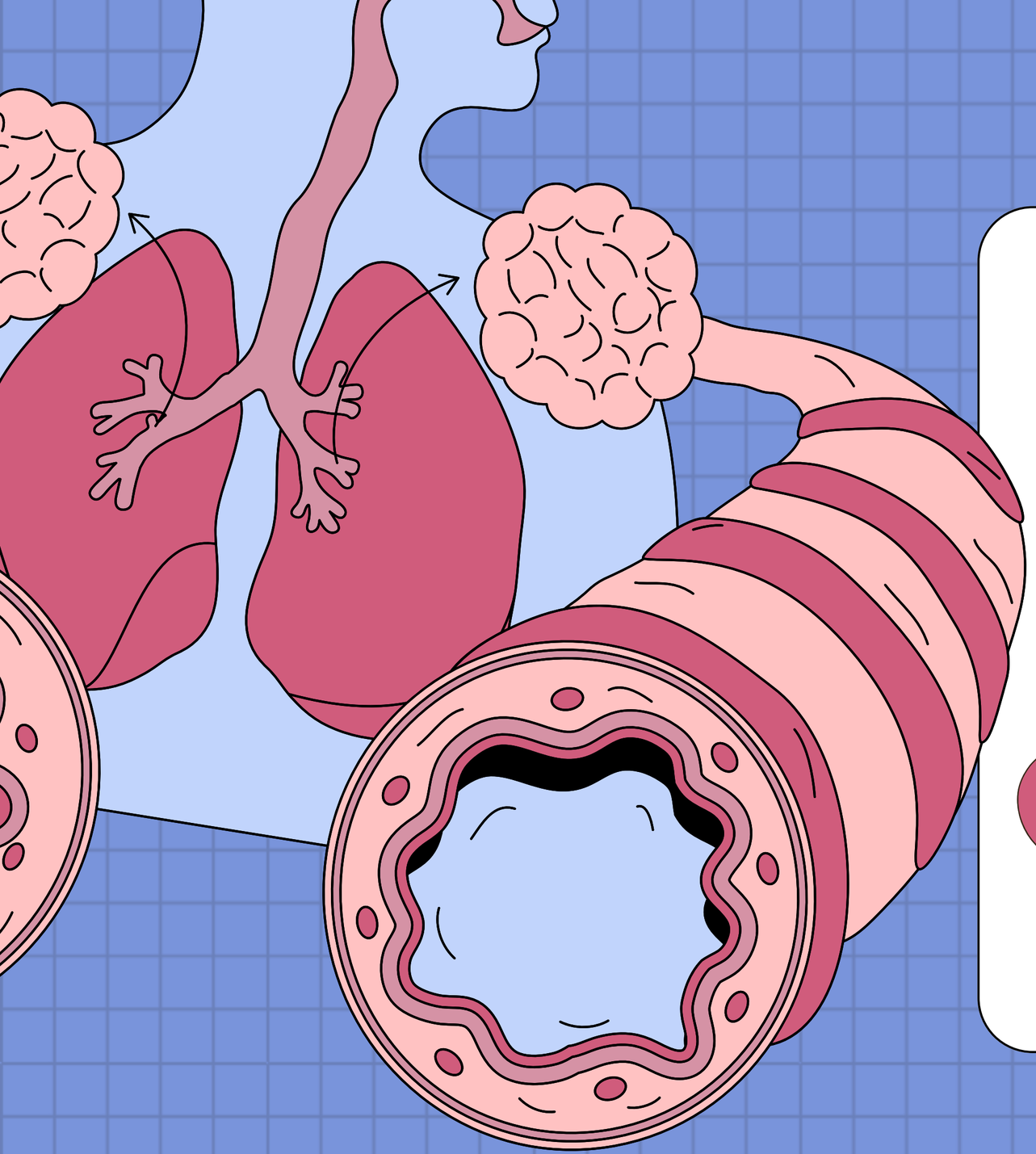
LET'S TALK ABOUT

THE RESPIRATORY SYSTEM



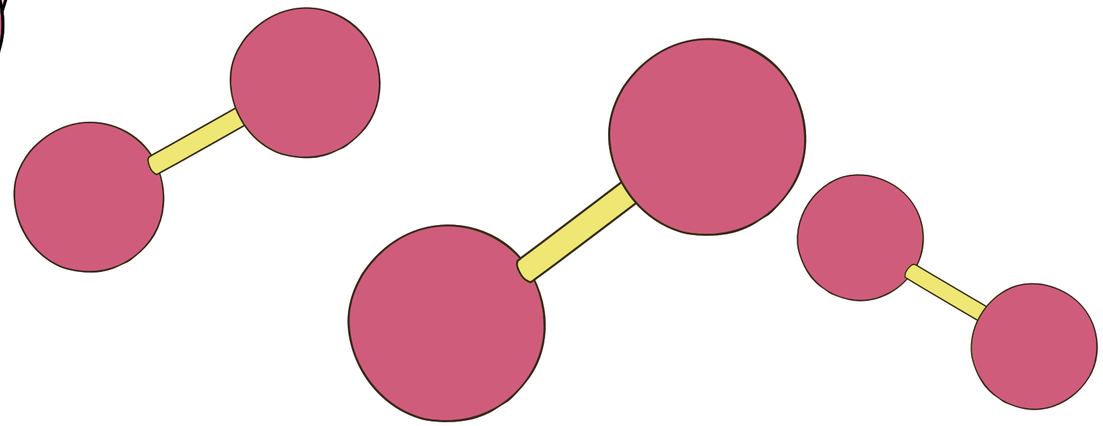




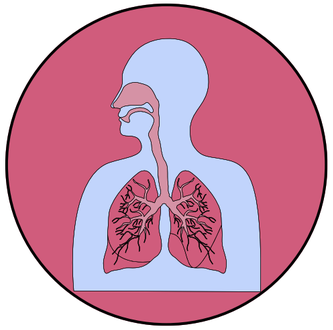


LET'S IMAGINE

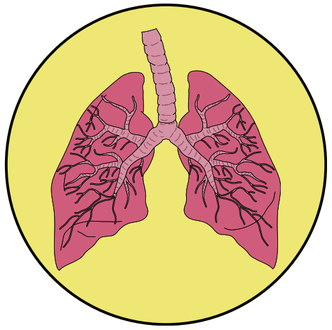
Imagine you're a tiny oxygen molecule taking a thrilling journey through the human body. Where would you start, and how would you navigate your way to the ultimate destination—the alveoli?



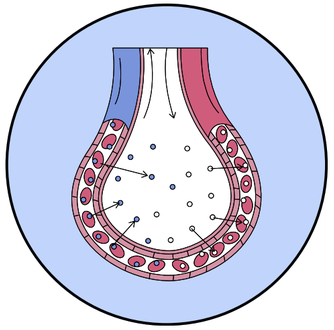
LESSON OBJECTIVES



Identify the key organs of the respiratory system, including the nose, pharynx, trachea, bronchi, lungs, and diaphragm.



Explain how oxygen enters the body, travels through the respiratory system, and reaches the alveoli for gas exchange.



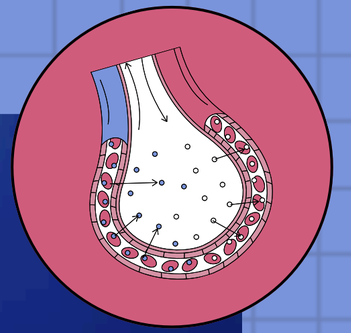
Describe the process of gas exchange: the movement of oxygen and carbon dioxide between the alveoli and the bloodstream.

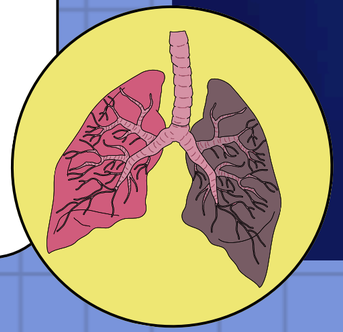
LET'S DISCUSS

RESPIRATORY SYSTEM

The respiratory system consists of a set of organs and tissues involved in the uptake of oxygen from the atmosphere and the release of carbon dioxide generated during aerobic respiration.

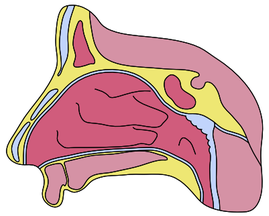
This gas exchange is also called breathing, or external respiration. It plays a crucial role in maintaining our body's oxygen supply and removing waste gases.



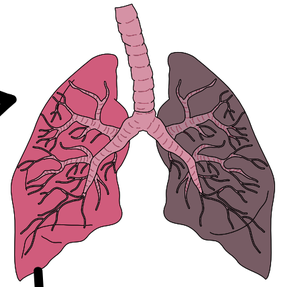


OXYGEN TRAVEL

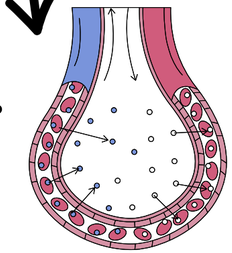
This flowchart simplifies a complex process that captures the essential steps involved in oxygen transport and gas exchange within the respiratory system.



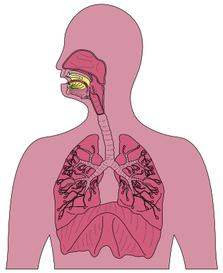
Air enters through the nose or mouth. It passes through the pharynx and larynx. The trachea carries air down into the bronchi.



The bronchi divide into smaller bronchioles. These bronchioles lead to clusters of alveoli in the lungs.



In the alveoli, oxygen diffuses into the bloodstream. Carbon dioxide diffuses out of the bloodstream into the alveoli.

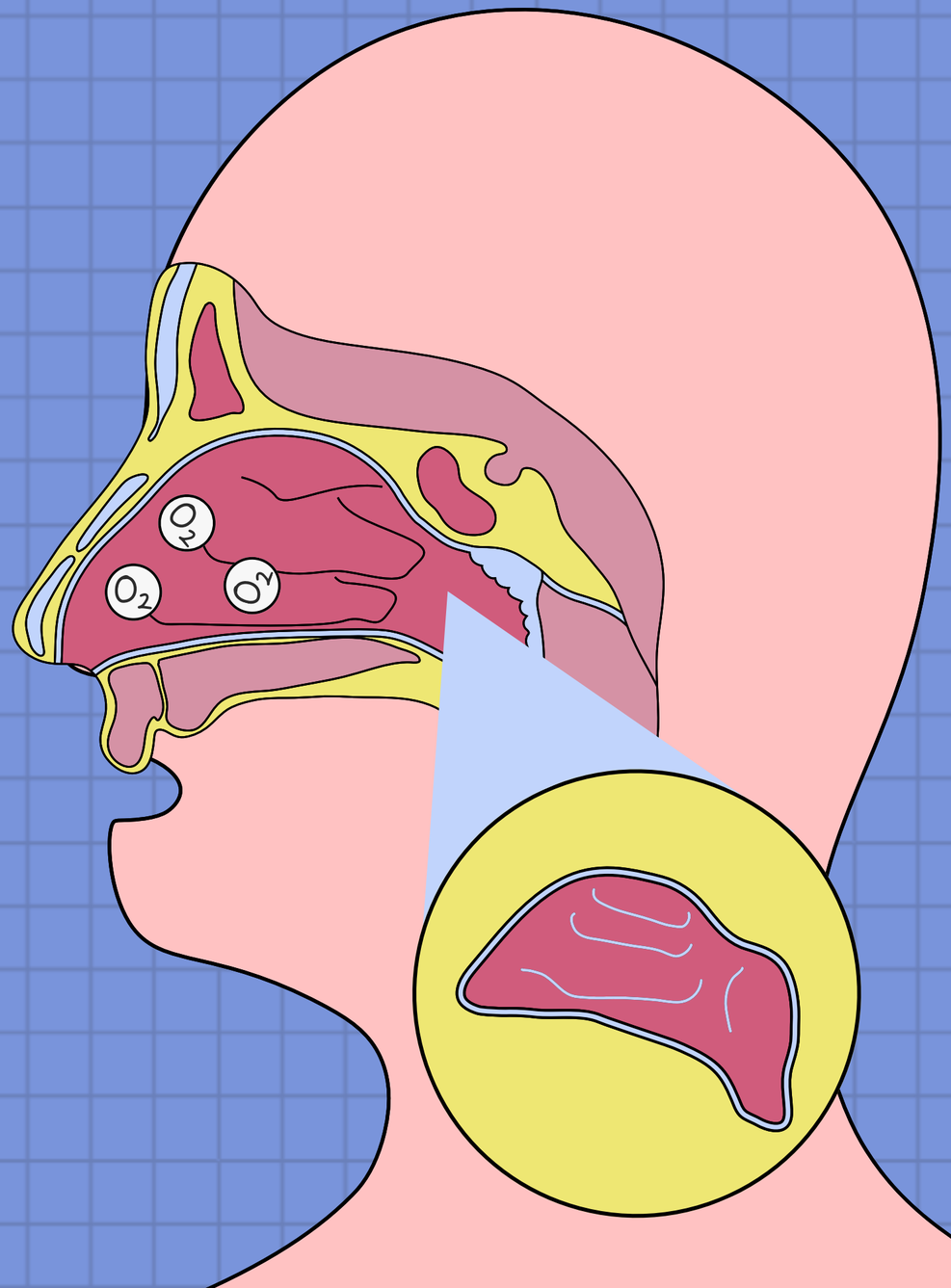


The diaphragm relaxes, pushing air out of the lungs. Air exits through the trachea, larynx, and either the nose or mouth.

RESPIRATORY ORGANS

NOSE AND NASAL CAVITY

The nose serves as the primary entry point for air. Inside the nose, we find the nasal cavity, which filters incoming air, removing dust and particles; warms and humidifies the air before it reaches the lungs; and contains olfactory receptors for our sense of smell.

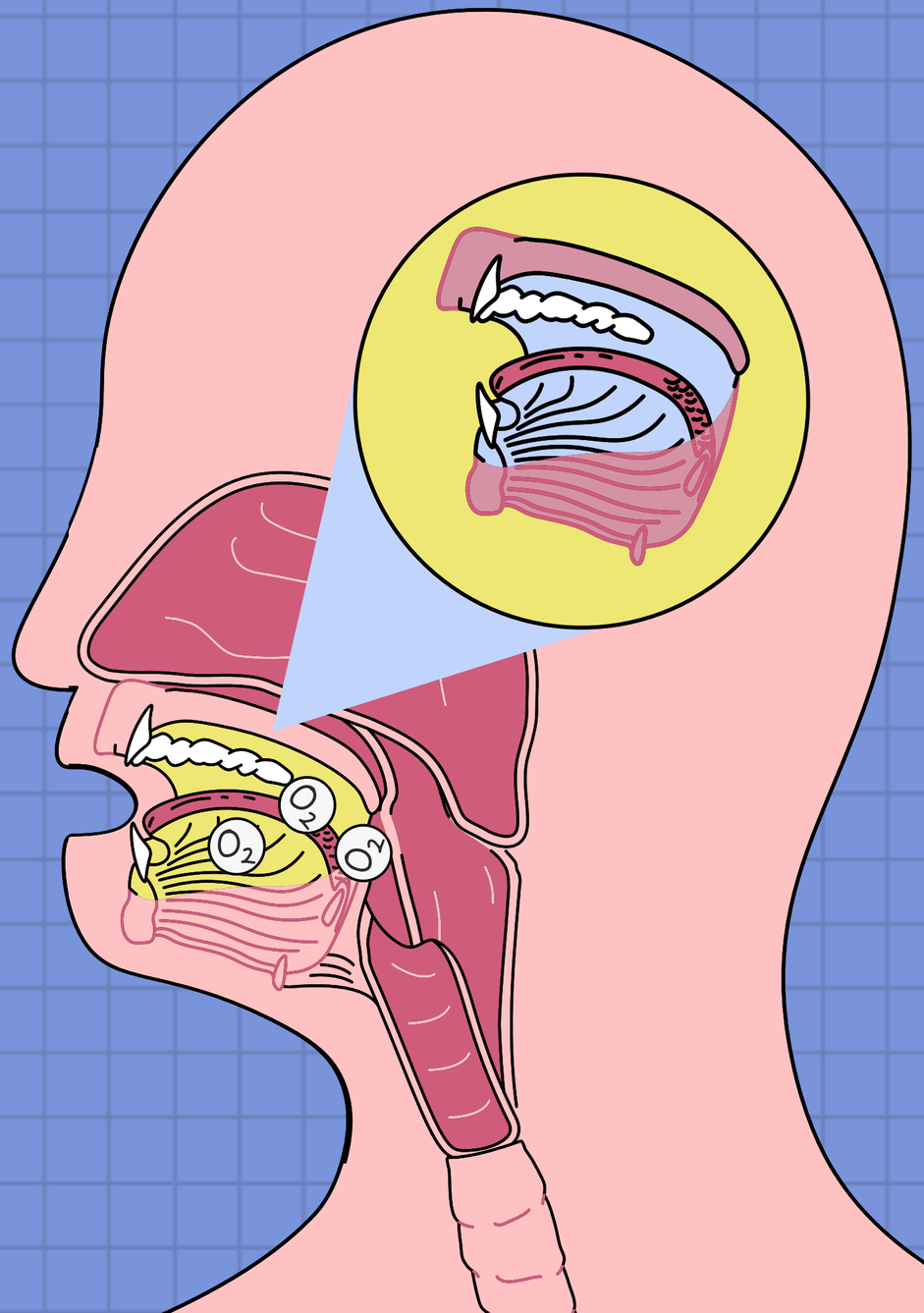


RESPIRATORY ORGANS

MOUTH AND ORAL CAVITY

The mouth can also serve as an alternate entry point for air. The oral cavity plays a minor role in respiration but is essential for speech and swallowing.

If the nasal passages are blocked, breathing through the mouth becomes essential.

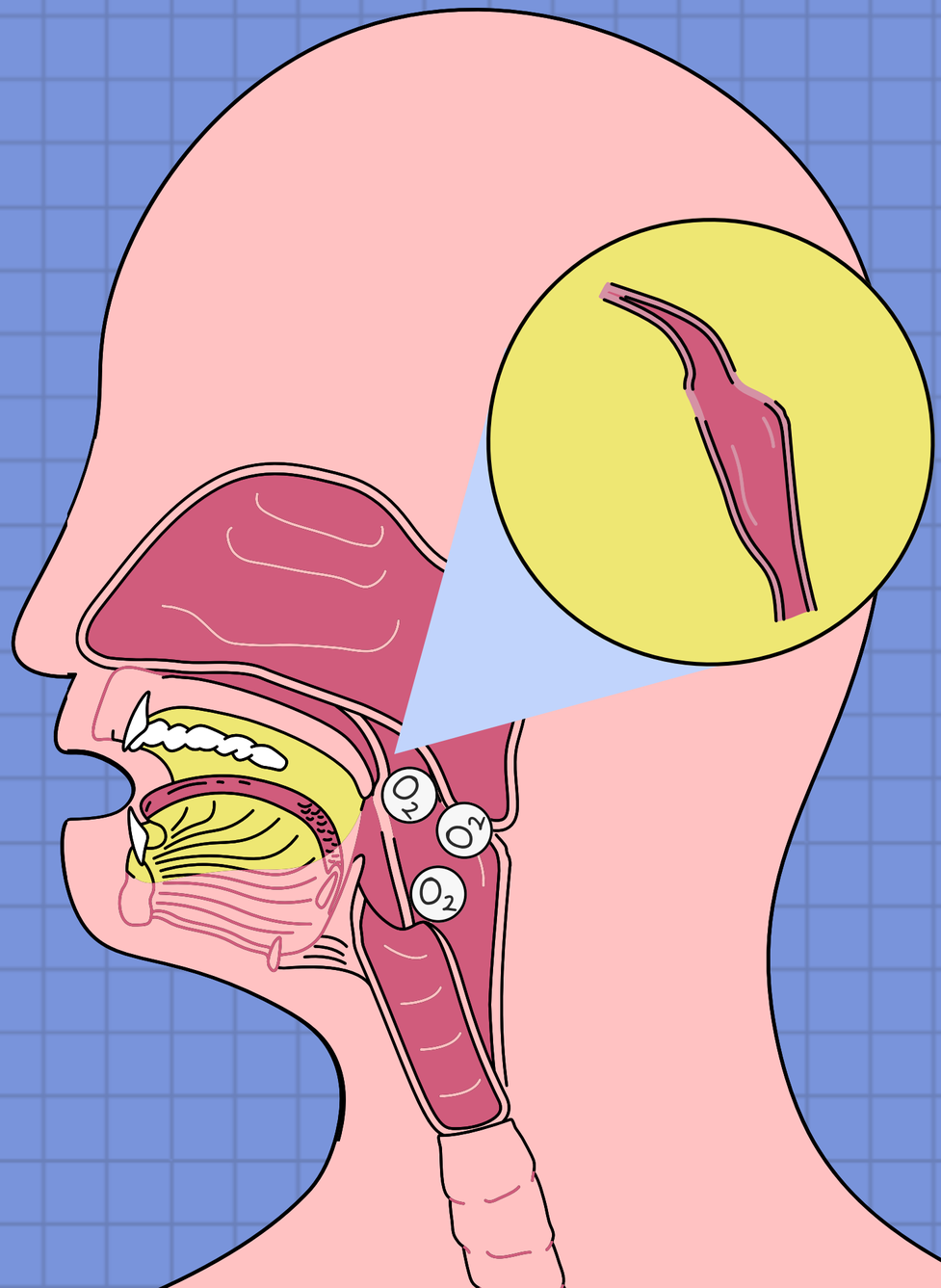


RESPIRATORY ORGANS

PHARYNX (THROAT)

The pharynx connects the nasal cavity and mouth to the trachea. It serves as a common pathway for both air and food.

The epiglottis, a flap-like structure in the pharynx, prevents food from entering the trachea during swallowing.

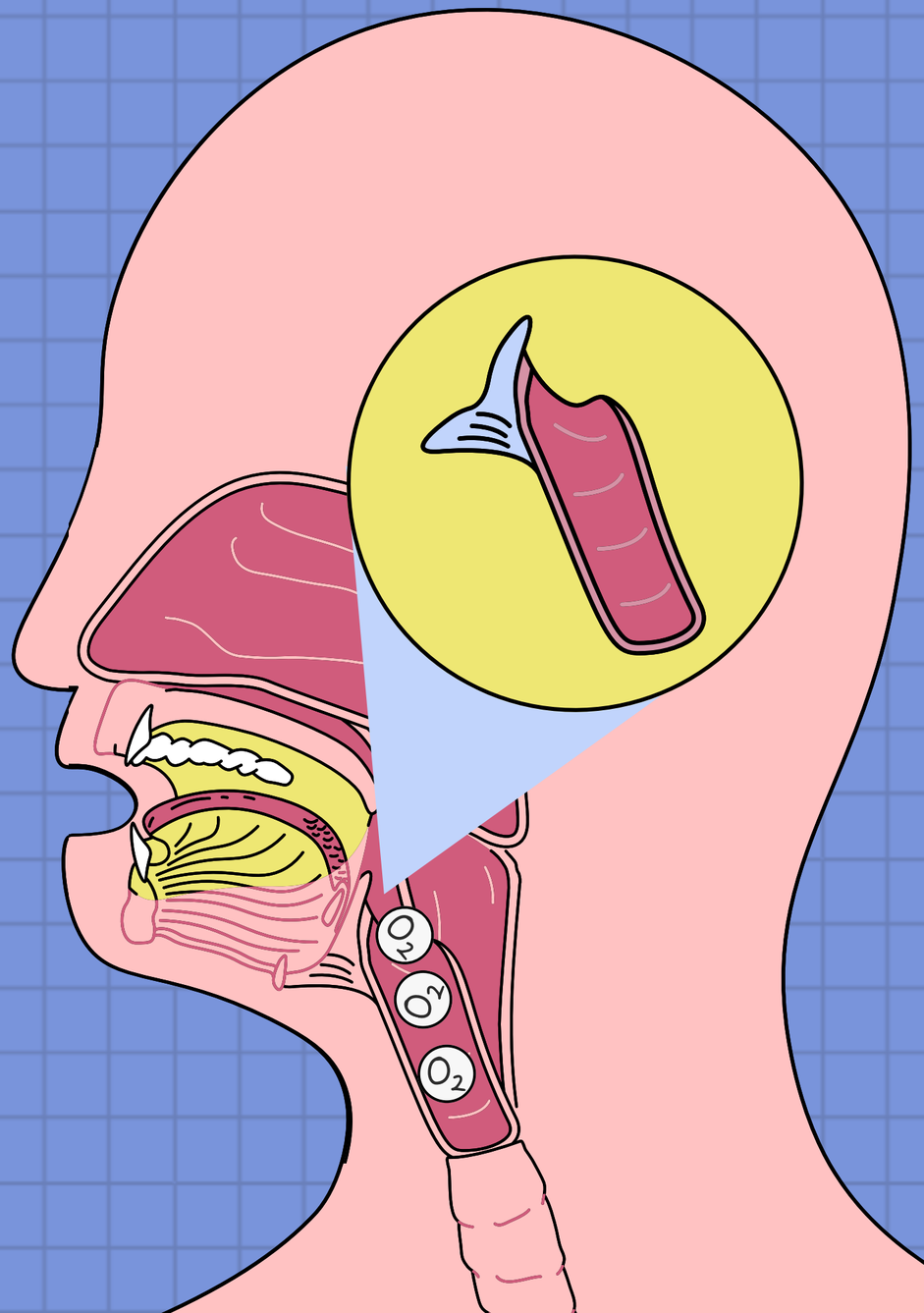


RESPIRATORY ORGANS

LARYNX (VOICE BOX)

The larynx is a tough, flexible segment of the respiratory tract that connects the pharynx (the back of the nose and throat) to the trachea (windpipe).

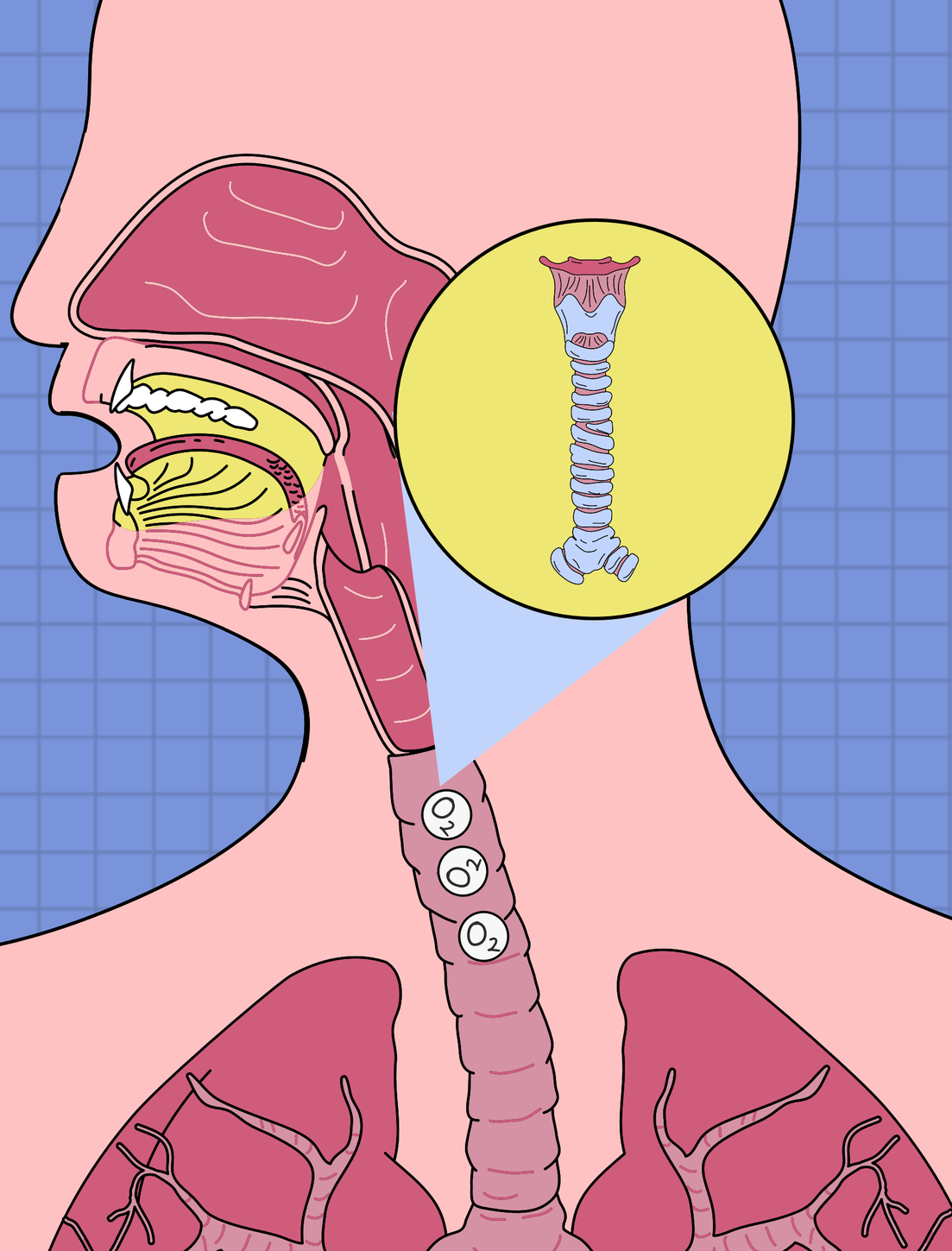
It allows air to pass through it while preventing food and drink from blocking the airway.



RESPIRATORY ORGANS

TRACHEA (WINDPIPE)

The trachea is a wide, hollow tube that connects the larynx to the bronchi (airways) of the lungs. Its primary function is to enable airflow to and from the lungs. This preparation ensures that the air entering the lungs is at an optimal temperature and humidity level for efficient gas exchange.

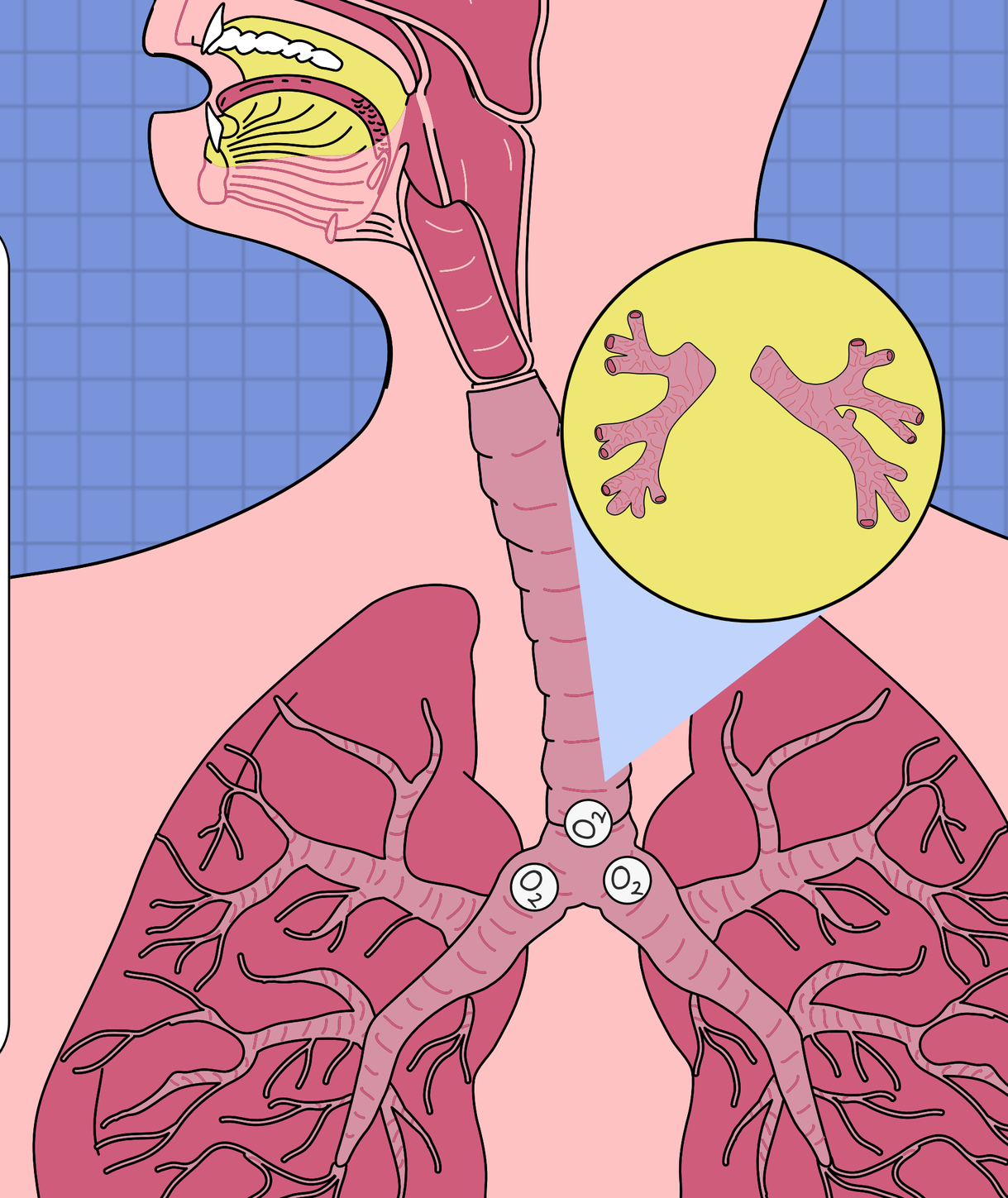


RESPIRATORY ORGANS

BRONCHI

The bronchi are the main airways into the lungs. When you breathe, air enters your body through your mouth or nose and passes through the larynx and trachea. The trachea branches into a bronchus in each lung.

The bronchi are equipped with tiny, hair-like structures called cilia. Cilia help move mucus out of your lungs, keeping the bronchi clean and healthy.

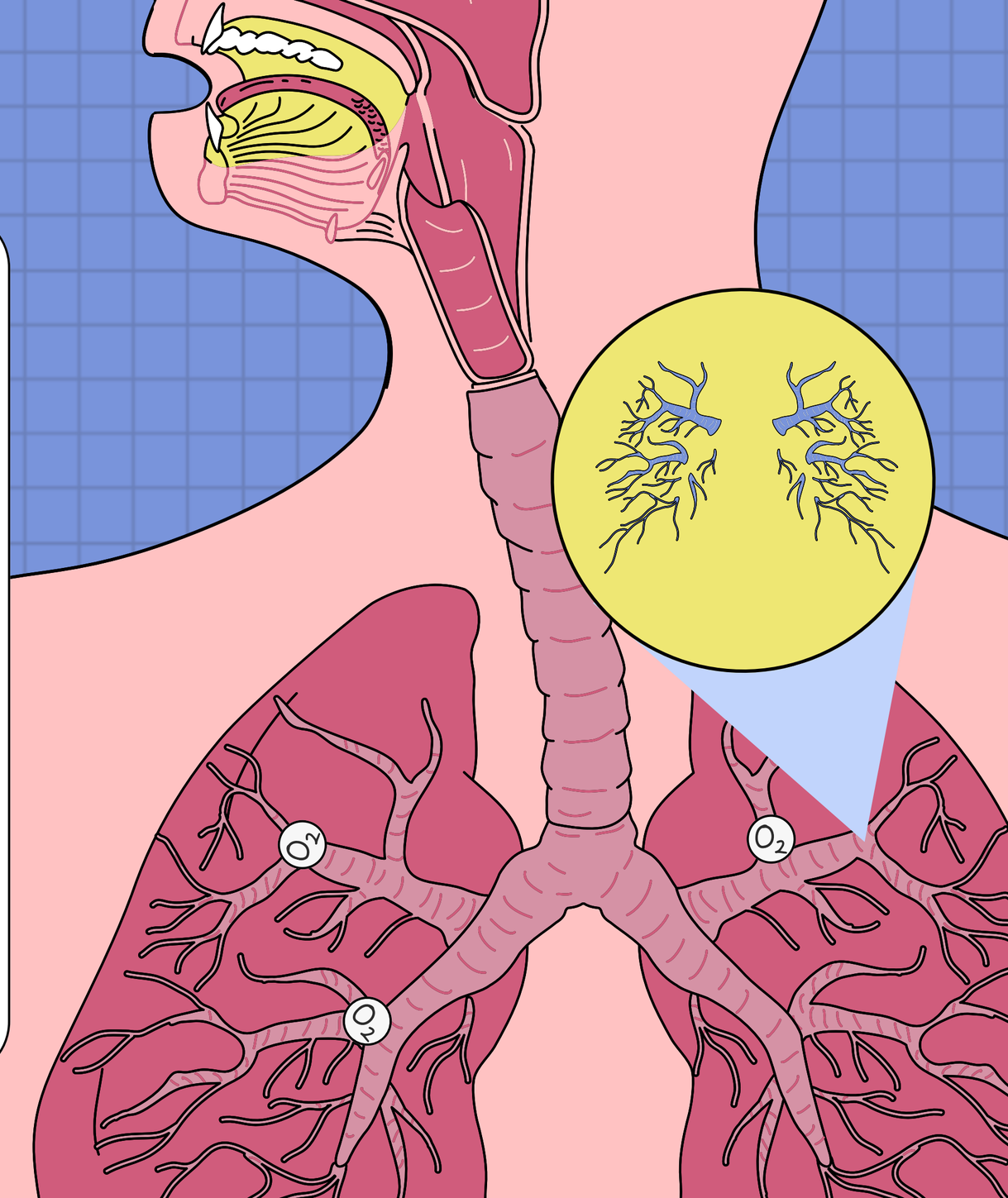


RESPIRATORY ORGANS

BRONCHIOLES

Bronchioles are small, branching air passages inside the lungs. They serve as conduits for air, connecting the larger bronchi to the alveoli

Alveoli are where gas exchange occurs: oxygen enters the bloodstream, and carbon dioxide is removed during exhalation. Bronchioles deliver air to a diffuse network of approximately 300 million alveoli.

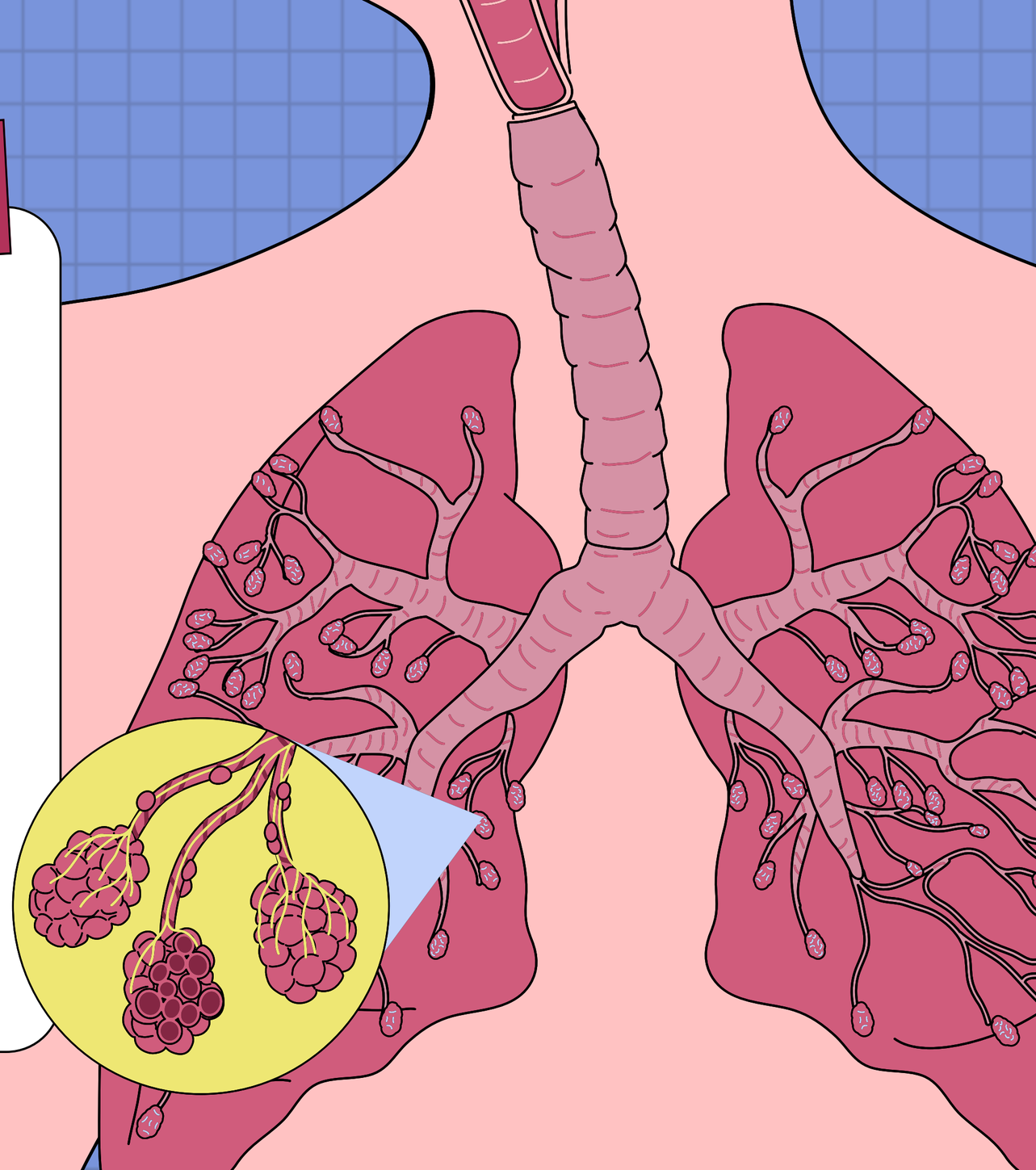


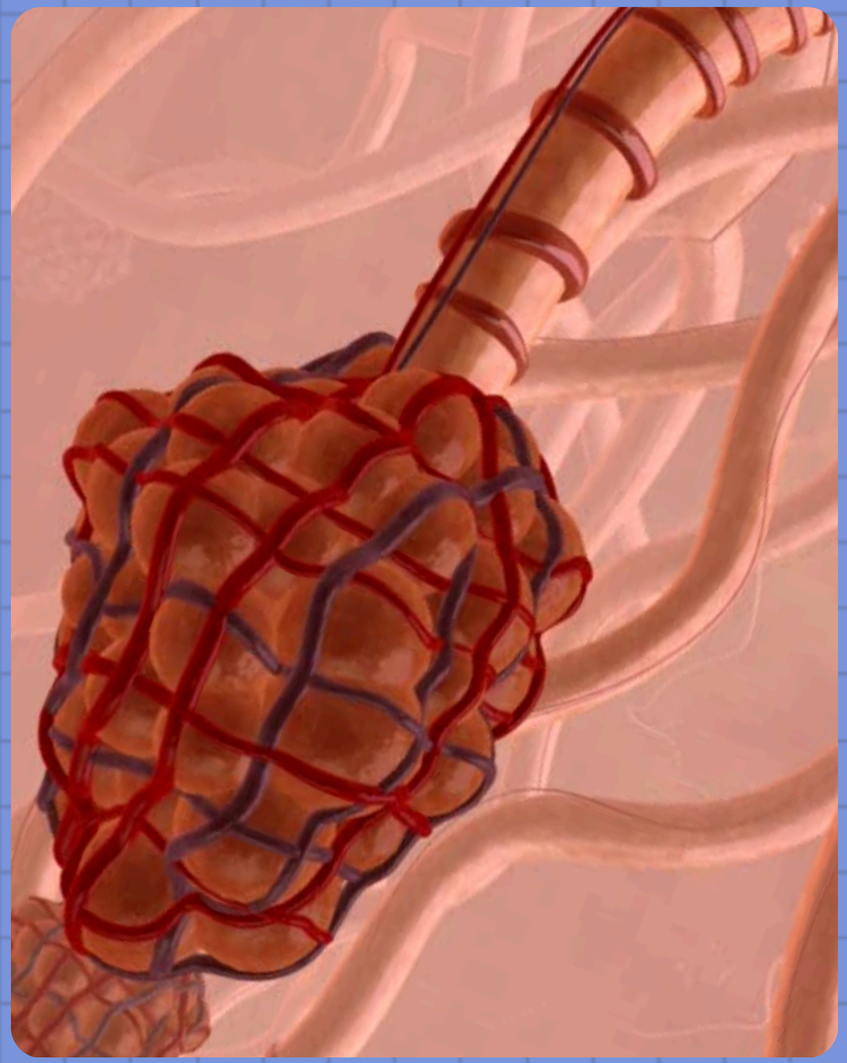
RESPIRATORY ORGANS

ALVIOLI

Alveoli are tiny, air sacs located at the end of the bronchioles. These structures play a crucial role in gas exchange during breathing.

In the alveolus, oxygen molecules move through a single layer of lung cells, entering the bloodstream. Simultaneously, carbon dioxide (CO_2) molecules pass from the bloodstream into the alveolus.





LET'S DISCUSS

GAS EXCHANGE

- During external respiration, oxygen-rich air enters the alveoli during inhalation.
- Oxygen molecules diffuse across the thin alveolar walls into the bloodstream, where they bind to hemoglobin in red blood cells.
- Simultaneously, carbon dioxide (produced by cellular metabolism) diffuses from the blood into the alveoli.
- During internal respiration, oxygen is delivered to body tissues, and carbon dioxide is removed from the tissues and transported back to the lungs for exhalation.

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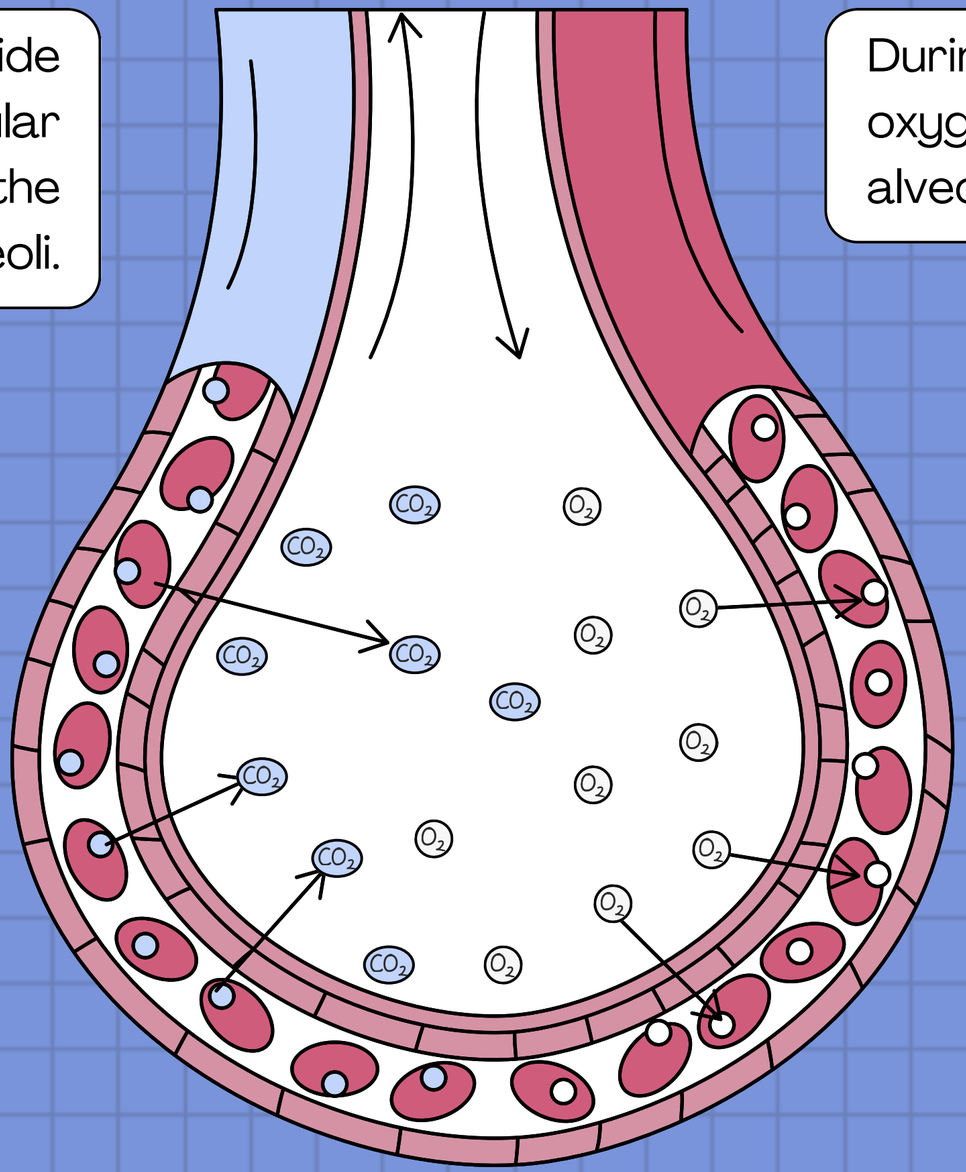

Oxygen molecules diffuse across the thin alveolar walls into the bloodstream, where they bind to hemoglobin in red blood cells.

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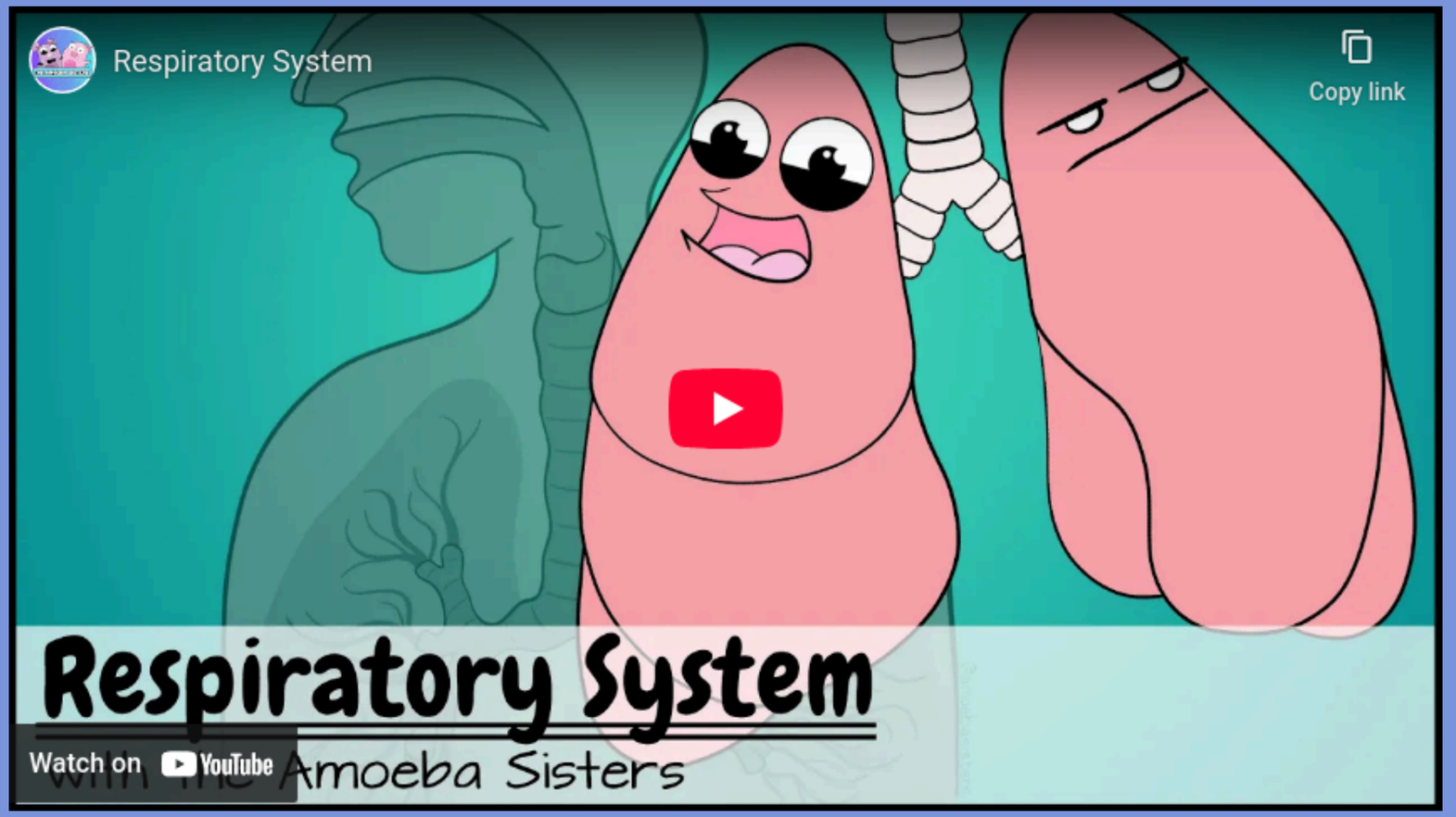
Let’s watch this awesome video about the Respiratory System!



QUESTIONS?