

Gas exchange in humans

List the order of air passage from the mouth to the alveoli.

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What are alveoli?

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What is the function of the diaphragm?

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Where are the internal and external intercostal muscles?

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State the function of cartilage in the trachea.

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State four features of a gas exchange surface in humans.

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Why does a good blood supply help gas exchange?

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Why is a thin surface an advantage for gas exchange?

Tiny air sacs at the ends of the bronchioles where gas exchange takes place.

Larynx, trachea, bronchi, bronchioles, alveoli.

Between the ribs: the external muscles on the outside, the internal muscles underneath.

A sheet of muscle below the lungs that moves down and up to change the volume of the thorax.

Large surface area, thin surface, good blood supply and good ventilation with air.

It supports the trachea and keeps it open.

It gives a short diffusion distance, so gases diffuse faster.

It carries oxygen away and brings carbon dioxide, keeping a steep concentration gradient.

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Why does ventilation help gas exchange?

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What happens to the intercostal muscles and ribs when you breathe in?

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What does the diaphragm do when you breathe in?

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What happens to volume and pressure in the thorax when you breathe in?

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What happens in the thorax when you breathe out?

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How does expired air differ from inspired air?

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What is the test for carbon dioxide?

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How do you investigate inspired and expired air using limewater?

The external intercostal muscles contract and the ribs move up and out.

It keeps oxygen high and carbon dioxide low in the alveoli, maintaining a steep concentration gradient.

Volume increases and pressure decreases, so air moves in.

It contracts and flattens (moves down).

Less oxygen, more carbon dioxide and more water vapour.

The ribs move down and in, the diaphragm relaxes and domes up, volume decreases, pressure increases and air is pushed out.

Breathe in and out through two tubes of limewater and compare how quickly each turns cloudy.

Limewater turns cloudy (milky).

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Explain why expired air has more carbon dioxide.

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Explain why expired air contains more water vapour.

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Define rate of breathing and depth of breathing.

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What happens to breathing during physical activity?

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What does the brain detect to increase breathing during exercise?

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Explain the link between exercise and breathing rate.

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What do goblet cells do?

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What do ciliated cells do?

Water evaporates from the moist gas exchange surfaces in the lungs.

Cells produce carbon dioxide in respiration; it is carried in the blood to the lungs and diffuses into the alveoli.

The rate and depth of breathing both increase.

Rate is the number of breaths per minute.
Depth is the volume of air in each breath.

More respiration makes more carbon dioxide; the brain detects the increase and raises the rate and depth of breathing.

An increased carbon dioxide concentration in the blood.

Their cilia beat to move mucus with trapped pathogens and particles up and away from the lungs.

They make mucus, which traps pathogens and particles.