

Transport and exchange surfaces

Why must oxygen be transported to cells?

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Why must carbon dioxide be transported away from cells?

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What is urea and why is it transported?

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Why are dissolved food molecules transported to cells?

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Name six substances that need to be transported into or out of cells.

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How do you calculate surface area : volume ratio?

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What is the surface area : volume ratio of a 2 cm cube?

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What happens to the surface area : volume ratio as an organism gets larger?

It is a waste product of respiration and must be removed from the body.

It is used in aerobic respiration to release energy.

To provide energy (from respiration) and materials for growth and repair.

A waste product. It is carried in the blood to the kidneys and removed in urine.

Surface area $\div$ volume, usually written as x : 1.

Oxygen, carbon dioxide, water, dissolved food molecules, mineral ions and urea.

It gets smaller.

$24 \text{ cm}^2 : 8 \text{ cm}^3 = 3 : 1$.

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Why do single-celled organisms not need a transport system?

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Why do multicellular organisms need exchange surfaces and a transport system?

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What are alveoli?

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Which way do oxygen and carbon dioxide diffuse at the alveoli?

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Why do alveoli have walls only one cell thick?

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Why is a good blood supply important for the alveoli?

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How does breathing help gas exchange?

They have a small surface area : volume ratio and long diffusion distances, so diffusion alone is too slow.

They have a large surface area : volume ratio and a short diffusion distance, so diffusion is fast enough.

Oxygen from the alveoli into the blood.
Carbon dioxide from the blood into the alveoli.

Tiny air sacs in the lungs where gas exchange takes place.

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

To give a short diffusion distance, so gases diffuse quickly.

Ventilation keeps oxygen high and carbon dioxide low in the alveoli, maintaining the concentration gradient.