

Exchange

| Specification reference | Checklist questions | |
|-------------------------|---|--------------------------|
| 3.3.1 | Can you describe the relationship between the size of an organism or structure and its surface area to volume ratio? | <input type="checkbox"/> |
| 3.3.1 | Can you explain the changes to body shape and development of systems in larger organisms as adaptations that facilitate exchange as this ratio reduces? | <input type="checkbox"/> |
| 3.3.1 | Can you explain the relationship between surface area to volume ratio and metabolic rate? | <input type="checkbox"/> |
| 3.3.2 | Can you describe adaptations of gas exchange surfaces, shown by gas exchange: <ul style="list-style-type: none"> • across the body surface of a single-celled organism • in the tracheal system of an insect • across the gills of fish • by the leaves of dicotyledonous plants? | <input type="checkbox"/> |
| 3.3.2 | Can you explain the structural and functional compromises between the opposing needs for efficient gas exchange and the limitation of water loss shown by terrestrial insects and xerophytic plants? | <input type="checkbox"/> |
| 3.3.2 | Can you describe the gross structure of the human gas exchange system in terms of the alveoli, bronchioles, bronchi, trachea and lungs? | <input type="checkbox"/> |
| 3.3.2 | Can you describe the essential features of the alveolar epithelium as a surface over which gas exchange takes place? | <input type="checkbox"/> |
| 3.3.2 | Can you describe ventilation and the exchange of gases in the lungs? | <input type="checkbox"/> |
| 3.3.2 | Can you describe the mechanism of breathing, including the role of the diaphragm and the antagonistic interaction between the external and internal intercostal muscles in bringing about pressure changes in the thoracic cavity? | <input type="checkbox"/> |

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| 3.3.2 | Can you interpret information relating to the effects of lung disease on gas exchange and/or ventilation? | <input type="checkbox"/> |
| 3.3.2 | Can you interpret data relating to the effects of pollution and smoking on the incidence of lung disease? | <input type="checkbox"/> |
| 3.3.2 | Can you analyse and interpret data associated with specific risk factors and the incidence of lung disease? | <input type="checkbox"/> |
| 3.3.2 | Can you evaluate the way in which experimental data led to statutory restrictions on the sources of risk factors? | <input type="checkbox"/> |
| 3.3.2 | Can you recognise correlations and causal relationships? | <input type="checkbox"/> |
| 3.3.3 | Can you explain how large biological molecules are hydrolysed to smaller molecules that can be absorbed across cell membranes, during digestion. | <input type="checkbox"/> |
| 3.3.3 | Can you describe digestion of carbohydrates by amylases and membrane-bound disaccharidases in mammals? | <input type="checkbox"/> |
| 3.3.3 | Can you describe digestion of lipids by lipase, including the action of bile salts in mammals? | <input type="checkbox"/> |
| 3.3.3 | Can you describe digestion of proteins by endopeptidases, exopeptidases, and membrane-bound dipeptidases in mammals? | <input type="checkbox"/> |
| 3.3.3 | Can you describe the mechanisms for the absorption of the products of digestion by cells lining the ileum of mammals, including co-transport mechanisms for the absorption of amino acids and of monosaccharides and the role of micelles in the absorption of lipids? | <input type="checkbox"/> |